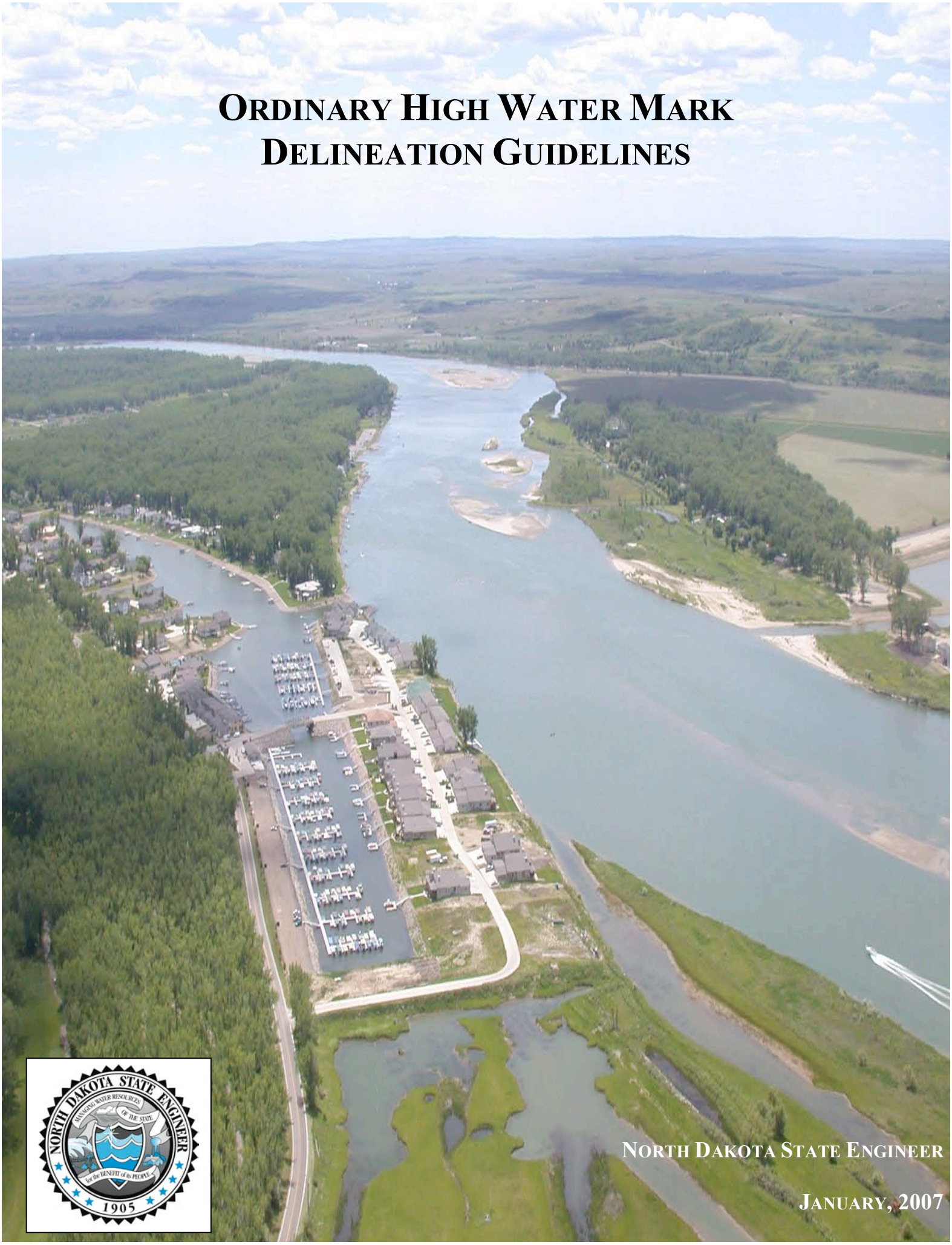
ORDINARY HIGH WATER MARK DELINEATION GUIDELINES



NORTH DAKOTA STATE ENGINEER

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NORTH DAKOTA STATE ENGINEER

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1.0 INTRODUCTION

A 2005 Attorney General Opinion advised the State Engineer to develop a comprehensive sovereign land management plan. One product of the resulting comprehensive planning process was the determination that specific guidelines needed to be developed for delineating ordinary high water marks (Reference 12). As such, these guidelines are intended to define a consistent and technically defensible approach for delineating the ordinary high water mark (OHWM) in both riverine and lake settings in North Dakota. Some degree of subjectivity will always remain with the delineator in the application of their technical expertise and field judgment, but every effort should be made to follow the procedures identified and to thoroughly document the basis for the delineation using the forms provided in these guidelines.

At the time of statehood, the federal government conveyed ownership of the beds of navigable lakes and streams to the state under the Equal Footing Doctrine. Currently the State Engineer is statutorily mandated with the responsibility of managing those lands in ND Century Code Chapter 61-33 (Reference 10). The State Engineer has developed a program for permitting various uses of sovereign land, and specific guidelines for that regulatory program have been adopted as administrative rule in Chapter 89-10-01 (Reference 7).

ND Century Code Section 61-33-01(Reference 10) defines "Sovereign Lands" as:

> …those areas, including beds and islands, lying within the ordinary high watermark of navigable lakes and streams…

ND Administrative Code Section 89-10-01-03 (Reference 7) defines "Ordinary High Water Mark" as:

> …that line below which the action of the water is frequent enough either to prevent the growth of vegetation or to restrict its growth to predominantly wetland species. Islands in navigable streams and waters are considered to be below the ordinary high watermark in their entirety.

The North Dakota Supreme Court has considered cases related to the delineation of OHWM's yet they have provided minimal guidance beyond the following definition (Reference 12):

> …a water mark. It is co-ordinate with the limit of the bed of water; and that only is to be considered the bed that the water occupies sufficiently long and

> continuously to wrest it from vegetation, and destroy its value for agricultural purposes…
>
> In some places, however, where the banks are low and flat, the water does not impress on the soils any well-defined line of demarcation between the bed and the banks. In such cases the effect of the water upon vegetation must be the principal test in determining the location of high water mark as a line between the riparian owner and the public. It is the point up to which the presence of action of the water is so continuous as to destroy the value of the land for agricultural purposes by preventing the growth of vegetation, constituting what may be termed an ordinary agricultural crop. (Reference 8)

Delineation of an OHWM typically requires the application of multiple disciplines. Expertise in wetland delineation, botany, soil science, stream morphology as well as hydrology and hydraulics may all be employed in some instances. The following guidelines provide a template for the application of these multiple disciplines. However, it is important to recognize that delineations must be conducted by Office of the State Engineer staff or a designee in establishing an official ordinary high water mark on any of the state's navigable waters.

2.0 INDICATORS

There are various indicators that can be used to delineate an OHWM. A delineation will normally involve assessment of a combination of several different indicators including, but not necessarily limited to, soils, vegetation, hydrology, and other physical indicators. Because of the widely varying indicators needing to be considered, a delineation often requires the application of expertise in various scientific disciplines.

The following sections provide a brief discussion of the indicators typically used to delineate an OHWM. A more detailed discussion of the specific application of these indicators is included in **Section 3.0**.

2.1 Vegetation

Vegetation is a primary OHWM field indicator. However, it should be used in combination with other indicators whenever possible to ensure an accurate delineation. A delineator should have basic training in vegetation identification and the use of plant keys.

The presence or lack of certain vegetative species can be vital to the delineation process. A zone of vegetation dominated by non-wetland species transitioning to mostly wetland vegetation is an excellent indicator. These vegetative transitions can be gradual depending on the specific landscape, so it is important to correctly identify the vegetation and its indicator status. While, by definition, the area below the OHWM contains 'predominantly' wetland vegetation, non-wetland vegetation may be present below the

OHWM; however the exposure to moving water or saturation of the roots may result in recognizable signs of stress.

There are other vegetation related features to evaluate in addition to the actual plant species present. These features include, but are not limited to, adventitious roots, waterlines on tree trunks, multiple trunks, and exposed roots. These are all indicators that water has been present there often enough, and for a long enough period of time, to cause morphological changes in the plants or to remove the soils in which the plants were established. It is important to consider these indicators in conjunction with hydrology and/or soils, since these features can also be caused by large flood events which are not representative of an OHWM.

2.2 Soils

Soils, along with vegetation, are also considered a primary OHWM indicator. However, as with vegetation, soils should be used in combination with other indicators whenever possible.

Soils can be used as an indicator in two distinct ways; one involving simply the observation of surface evidence, and the other involving analysis of the subsurface through the use of borings or pits. In the case of the former, individuals trained in soil science, engineering, or river morphology may observe noticeable changes in soil appearance, erosion, sediment deposition, changes in texture, rippling, or shelving. In the case of the latter, the analysis in North Dakota must be performed by a Licensed Soil Classifier and includes a transect of borings or pits starting at an upland area and working toward the shoreline looking for specific soil conditions indicative of periodic inundation.

The direct application of soils as an indicator is discussed in greater detail in **Section 3.2**. As noted in that discussion and on the field data form included in **Appendix A** of these guidelines, the work of a Licensed Soil Classifier may not be a requirement to complete a delineation, but it is additional information that can be useful in the process.

2.3 Other Physical Indicators

In addition to the evaluation of vegetation and soils, there are other physical indicators which can contribute valuably to a delineation. These include debris, wrack, and mudlines visible along the bank, although care must be taken to ensure that these indicators are not evidence of extraordinarily high flow events. Other potentially useful physical indicators can also include ice scars, pollen, algae, or water staining. The application of these other physical indicators is discussed in greater detail in **Section 3.3**.

2.4 Hydrology

While soils and vegetation are considered the primary indicators of the OHWM, hydrology is an additional tool that may be available and should not be ignored in the delineation process. It is hydrology which drives the water level fluctuations, and the evidence left in the form of vegetation, soils and other physical indicators are simply reflections of that hydrology.

There are few case law examples of courts giving significant credence to statistical hydrology as a suitable primary indicator of ordinary high water. However, it can be a valuable tool as a cross check for the results obtained using other indicators and in those cases where other physical indicators result in ambiguity and uncertainty. In some locations the natural bank line and vegetation may have been replaced by bank stabilization and a well manicured lawn. Hydrology may be useful in such an instance to extrapolate a delineation from physical indicators upstream or downstream of the site.

A review of recent stream flow conditions may also provide additional context for the results noted in the field. If a significant flood event occurred in the recent past, a review of current physical indicators alone may result in an erroneous delineation. A review of long term and recent hydrology may indicate whether physical indicators evident in the field are truly indicative of the ordinary high water mark or whether they reflect an extraordinary event.

The use of hydrologic analyses in delineating OHWM's will generally vary to a large extent between riverine and lake settings. In a riverine setting there may be stream flow records available from gages located in some proximity to the area to be delineated. Given a sufficient period of record, it may be possible to develop discharge frequency relationships for a given location. If a functional hydraulic model is available for the stream reach in question, it may also be possible to establish maps of inundation for flows of varying recurrence intervals.

Even if the data were available for such an analysis, there has been only minimal work completed to define a recurrence interval which is widely accepted as 'ordinarily' high. The Washington State Departments of Ecology and Fish and Wildlife developed a draft set of guidelines for delineating ordinary high water marks in which they included an in-depth assessment of the use of statistical hydrology. In general terms, they found that ordinarily high flows, occurring for sufficient duration to impact soils and vegetation, fall between the 1.0 to 1.75-year flood, derived from maximum annual peak flow data (Reference 11).

In those instances where sufficient stream flow records are unavailable, it may be possible to develop a discharge/frequency relationship using USGS regression equations, however, the applicability of those regression equations, specifically the size of contributing watershed over which they are considered valid, may rule out their applicability for most navigable streams (Reference 5).

In a lake setting, detailed records of either lake levels or inflows from the contributing watershed will generally be unavailable. However, some generalized data could be used to estimate inflows for various recurrence intervals. Where lake level records are unavailable, local historical accounts and survey meander lines may provide additional historic context. Using data available from the Soil Conservation Service's (SCS) Hydrology Manual, the yield to be expected from the contributing watershed for both 80 years out of 100 and 50 years out of 100 can be estimated. Precipitation data is likely available for the vicinity, and annual evaporation can also be estimated using the SCS Hydrology Manual (Reference 1). If the outlet elevation is known and the stage-area-capacity data is available or can be estimated, a simplistic hydrologic budget could be developed and used to bracket, verify, or supplement the results obtained using vegetation, soils and the other physical indicators.

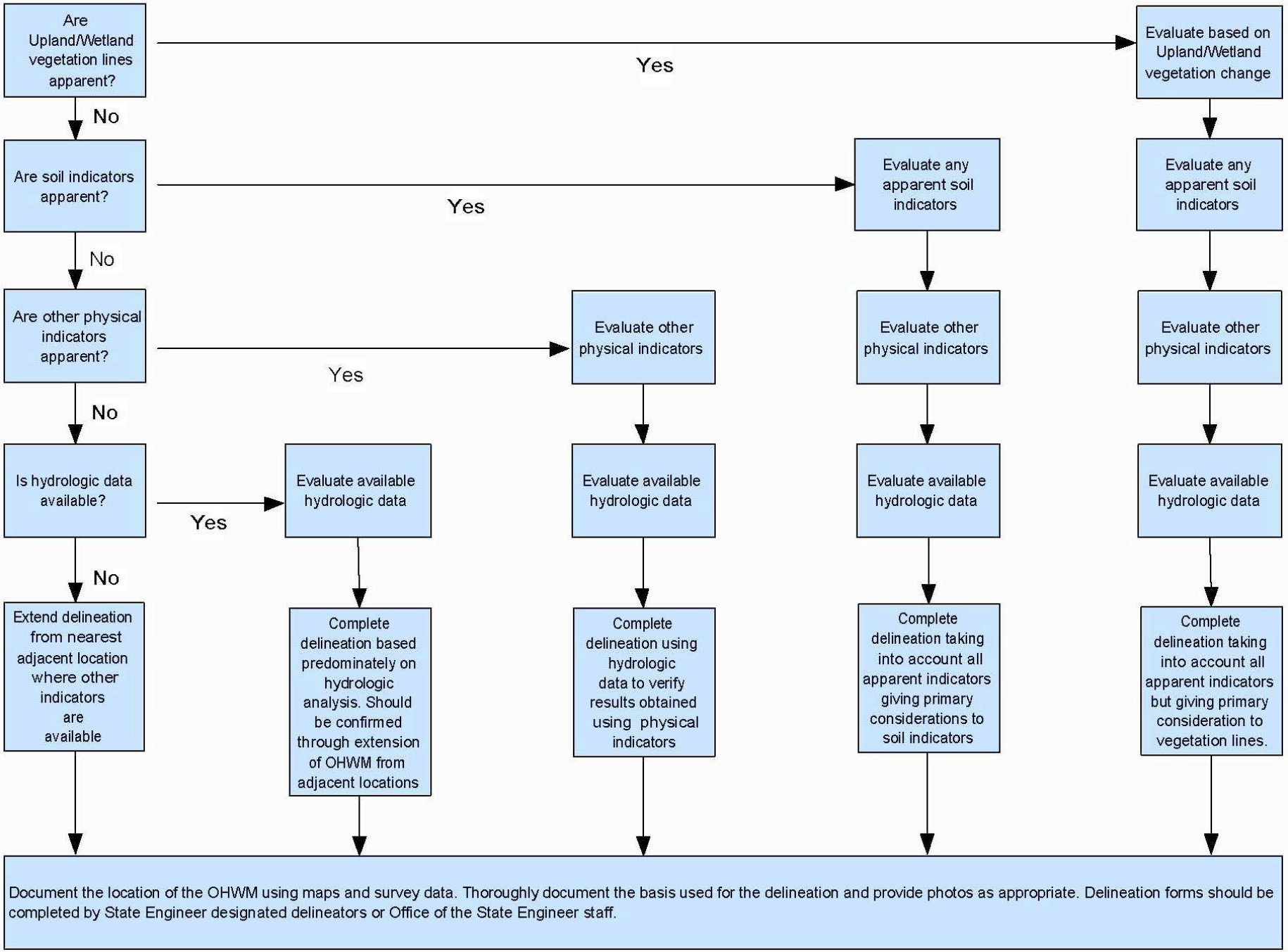
3.0 SPECIFIC APPROACH FOR DELINEATIONS

As described in the preceding section, the delineation of an OHWM typically involves the application of various scientific disciplines. The disciplines that may apply in one location may not be pertinent in another, given the indicators that may or may not be present. Therefore, the exact process used to complete delineations may vary accordingly from site to site, and must be documented in detail.

Even given this inherent variability, a generalized process flow chart for completing a delineation is included as **Figure 1**. The discussion that follows describes a specific process for using each type of indicator. The process illustrated in **Figure 1** involves a check list starting with vegetation and working down in priority to include soils, other physical indicators, and hydrology. If one indicator is found to be available in a given location, all other indicators available for assessment, even those of a generally lower priority, should still be evaluated in the delineation process. A data form is provided in **Appendix A** for recording the results of the delineation. Further explanation of the desired documentation is provided in **Section 3.6**.

Another consideration not included in the graphical illustration, which may prove beneficial, is completing some background office review prior to the field investigation. Although review of hydrologic data is considered lower in priority than vegetation, soils, and other physical indicators, a review of hydrologic data prior to completing any field investigation may be prudent. As discussed in the prior section, a preliminary review of historic and real time stream flow and meteorological data may provide context for the other indicators noted during the field investigation. If an extraordinarily high flow or water level was recently experienced, the indicators noted in the field may not reflect the OHWM. A preliminary review will also provide additional context as to the flow or water levels present at the time of the field investigation.

Figure 1:North Dakota OHWM Delineation Process Flow Chart



3.1 Vegetation Analysis

Vegetation will commonly be the single most useful OHWM field indicator. That said, it should be used in combination with other indicators whenever possible to ensure an accurate delineation. ND Administrative Code Section 89-10-01-03 (Reference 7) addresses vegetation's importance in defining the OHWM:

> …that line below which the action of the water is frequent enough either to prevent the growth of vegetation or to restrict its growth to predominantly wetland species.

In State ex rel. Sprynczynatyk v. Mills (Reference 8) the ND Supreme Court reinforces that level of importance in defining the OHWM:

> …It is co-ordinate with the limit of the bed of water; and that only is to be considered the bed that the water occupies sufficiently long and continuously to wrest it from vegetation, and destroy its value for agricultural purposes….
>
> In some places, however, where the banks are low and flat, the water does not impress any well-defined line of demarcation between the bed and the banks. In such cases, the effect of the water upon vegetation must be the principal test in determining the location of high-water mark as a line between the riparian owner and the public. It is the point up to which the presence of action of the water is so continuous as to destroy the value of the land for agricultural purposes by preventing the growth of vegetation, constituting what may be termed an ordinary agricultural crop.

Much as these two definitions vary to some degree, there are different approaches to using vegetation as an indicator. The most common approach is to identify the transition between predominantly wetland and predominantly non-wetland species. Another approach is to identify the transition between terrestrial vegetation and aquatic vegetation. The standard procedure for identifying the transition zone is to start in the upland area and proceed toward the water noting the vegetation changes. The emphasis is placed on the assemblage of plant species in the plant community and not individual species (Reference 3). Correct identification of vegetation through the use of plant keys and training is essential to OHWM delineations. If a plant species can not be identified in the field, a sample should be collected and identified in the office. If one is unsure of the plant's indicator status, the Natural Resources Conservation Service Plants Database located at http://plants.usda.gov/wetland.html may provide additional assistance. The plant's name, stratum, and percent cover should be indicated on the field data sheet provided.

The U.S. Fish and Wildlife Service has published a list of plant species found in wetlands in Region 4, which includes North Dakota (Reference 4), and that list is included in **Appendix B**. The Corps of Engineers 1987 Wetland Delineation Manual describes a process for using vegetation as a wetland delineator (Reference 3). To evaluate whether

a plant community is predominantly wetland, one needs to determine what species are dominant and how many of those species are wetland species. The plant community is characterized by the dominant species comprising each stratum (tree, sapling, shrub, herbaceous, woody vines) in the plant community. In order for these plant species to exist, there must be saturation for a long enough duration for them to become established. Dominance is measured by basal area for trees, by height for shrubs/saplings, by percent cover for herbaceous vegetation, and by number of stems for woody vines (Reference 3). **Table 1** provides definitions of the various strata.

Table 1
Definition of Vegetation Strata*

Strata	**Definition**
Tree	≥5 in dbh**, >20 ft in height
Sapling	.4 to <5 in dbh**, >20 ft in height
Shrub	Woody plants 3 to 20 ft in height, often multi stemmed
Herbaceous	Grasses, sedges, ferns, forbs and woody seedlings <3 ft in height
Woody Vine	Vines such as wild grape, etc.

*Modified from Reference 3
**dbh is the diameter at breast height which is approximately 4.5 feet from the ground (Reference 6)

The 50/20 rule is the method recommended by the COE (Reference 3) for determining the dominant species in each plant community. This rule states that:

> …dominant species in each stratum are the most abundant species (when ranked in descending order of abundance and cumulatively totaled) that immediately exceed 50% of the total dominance measure for that stratum, plus any additional species that individually comprise 20% or more of the total dominance measure for that stratum. The list of dominant species is then combined across strata.

If greater than 50% of the dominant plant species are OBL, FACW, or FAC (excluding FACU) using the 50/20 rule, then the vegetation is predominantly wetland. The 1988 National List of Plant Species that Occur in Wetlands (Reference 4) should be used to determine if the dominant plants are wetland species. The complete list can be found at http://www.fws.gov/nwi/bha/list88.html. The plant indicator status categories are defined in **Table 2**.

Table 2 Plant Indicator Status Categories*		
Indicator Categories	**Indicator Symbol**	**Definition**
Obligate Wetland Plants	OBL	Plants that occur almost always (>99% probability) in wetlands under natural conditions but which may occur (<1% probability) in non-wetlands.
Facultative Wetland Plants	FACW	Plants that occur usually in wetlands (>67% to 99% probability), but occur in non-wetlands (1% to 33% probability).
Facultative Plants	FAC	Plants with a similar likelihood (33% to 76% probability) of occurring in both wetlands and non-wetlands.
Facultative Upland Plants	FACU	Plants that occur sometimes (1% to <33% probability) in wetlands but occur more often (>67% to 99% probability) in non-wetlands.
Obligate Upland Plants	UPL	Plants that occur rarely (<1% probability) in wetlands but occur almost always >99% probability) in non wetlands under natural conditions.
*Modified from Reference 3		

Another approach that may be helpful in some settings is to identify the transition between terrestrial vegetation and aquatic vegetation. This is a different transition generally occurring at a lower elevation, or closer to the water's edge, than the transition between wetland and non-wetland species. Unlike the work that's been done to aid in differentiating between wetland and non-wetland plant species, there are no location specific lists of aquatic versus terrestrial plant species typically found in North Dakota, however a delineator trained in botany will be capable of noting the distinction. Wherever both vegetative transitions are apparent, they should both be noted and considered in combination with all the available indicators.

It is also important to note that while, by definition, the area below the OHWM consists of predominantly wetland species, non-wetland vegetation, can be present below the OHWM, however it may show signs of stress due to exposure to moving water or root saturation. It may also have been washed away by moving water or unable to establish itself because of saturated conditions. Features such as adventitious roots, shallow root systems, waterlines on tree trunks, multiple trunks, and exposed roots are all indicators that water is, or has been, present there often enough, and for a long enough period of time, to cause morphological changes in the plants (Reference 3) or to remove the soils the plants were established in.

Another consideration is that species typically considered wetland species may be found above the OHWM. One example may be the mature cottonwoods on the high bank of the Missouri River which were seeded as a result of inundation during the un-regulated period prior to the construction of Garrison Dam. This is an important example of a situation where the transition between terrestrial and aquatic vegetation may provide

additional insight as well as an example of a situation where hydrologic changes, in this case resulting from the construction of Garrison Dam, need to be considered in combination with the identified transition between wetland and non-wetland vegetation.

3.2 Soils Analysis

The mark that water leaves on the soil is commonly considered a useful indicator for delineation of an OHWM, but using changes in soil characteristics as an indicator can be complicated and can vary between riverine and lake settings. Soil changes should be used in conjunction with other indicators, such as vegetation and hydrology whenever possible.

One of the most easily observable soil characteristics as an indicator is a noticeable change in the appearance of the soil surface. This shift in appearance could be a change in texture or color that is caused by the action of water on the surface that leaves an obvious mark on the soil.

A discernable mark on the soil could also be caused by erosion and sediment re-deposition. Water can transport smaller soil particles, such as silt or clay, and can result in finer particles being deposited on the surface below the OHWM; whereas above the OHWM, the surface soil may be a coarser texture. In the case of flowing water, the finer particles may be washed away, leaving behind sand or gravel below the OHWM or exposing cobble or boulder lines. Observations of the soil surface can also reveal where the water action has been. Ripples left in sandy or silty soil are evidence that the soil was once submerged (Reference 9).

Looking carefully at the soil for the presence of organic matter can assist in determining if water had been present there for any length of time. Peaty or mucky soils cannot form under dry or well drained conditions, meaning soils with these textures are found below an OHWM.

Shelving along banks of water bodies is another subtle indicator of where water levels have been (Reference 9). In places where there is a sharp bank instead of a gradual shoreline, soil will wash out from under itself and leave a small hanging shelf. This is not evident in all soil textures and will not form in places where wave action may knock the hanging shelves loose. These shelves are not easily visible from standing on the bank, so the ability to view the bank from another vantage point may be necessary.

An optional technique for using soils is examining the subsurface of the soil using a shovel, auger, or soil pit. This technique should only be used by a delineator who is a Licensed Soil Classifier in the State of North Dakota. A transect of soil pits should be used starting at an obviously upland area and working perpendicular toward the water's edge (Reference 9). Long term saturation of the soil will result in soil that has a low chroma matrix due to anaerobic conditions (Reference 3). Keep in mind that fill materials or soils that have been disturbed may not display these hydric characteristics. The inundation in a lake setting may be of sufficient duration to result in establishment of

hydric characteristics, while the inundation in a riverine setting may not be of sufficient duration to do so. The presence of hydric soils is not a definitive indicator of an OHWM. Rather, it is more the identification of changes resulting from the frequent presence of water that is important.

3.3 Assessment of Other Physical Indicators

There are other physical indicators that can be useful in OHWM delineations. A listing of such indicators follows with an accompanying brief discussion. Those indicators listed should not be considered the only possible physical indicators. The delineator should feel free to use any and all physical indicators that may contribute to an accurate delineation.

- **Wrack. Debris, and Mud lines**

Areas containing wrack, debris and mud lines may, in some instances, actually be above the OHWM, as that debris may have been left behind as a result of an unusually high flood event. The use of wrack and debris lines should be closely coordinated with a review of recent streamflow records to determine whether the debris might be the result of an ordinary or extraordinary event (Reference 9).

- **Ice Scars**

Dispersed chunks of ice can scar trees, rock and soil. However, caution should be exercised in using ice scars as an indicator (Reference 13). Much as with wrack and debris lines, ice scars can be located above the OHWM. As with wrack and debris lines, the use of ice scars should be closely coordinated with a review of recent streamflow records in an attempt to determine whether the scars are indicative of an ordinarily or extraordinarily high event.

- **Pollen or Algae Staining**

Algae and pollen can result in stains on rocks, trees, and man-made structures. These stains can be useful in identifying the approximate location of the OHWM. However, splashing and wave action can, in some locations, result in stain lines that are above the OHWM (Reference 13).

- **Water Staining**

Stains left by water can also be a useful indicator. The State of Wisconsin Waterway and Wetland Handbook (Reference 13) indicates three stain lines will generally be evident with a band of gray on the bottom then a lighter band followed by a darker band on top. The OHWM is typically located at the boundary between the lighter color band and the top dark band.

3.4 Hydrologic Assessment

While vegetation and soils are commonly considered the primary indicators of the OHWM, it is hydrology that drives the water level fluctuations, and the evidence left in the form of vegetation, soils and other physical indicators are simply reflections of that hydrology.

In some locations, bank stabilization efforts and the development of landscaped and manicured lawns may have eliminated the presence of other primary vegetative and soil indicators. In those locations, the OHWM delineation may need to be based predominantly on extrapolation from nearby locations where these indicators are available. A hydrologic assessment may be completed to facilitate such an extrapolation.

In all instances, the hydrologic assessment is a tool to be used to verify, bracket, or supplement the results obtained through identification and analysis of the other indicators. Hydrology should only be used as a primary indicator when the other indicators are not available or when their use yields inconclusive or conflicting results.

The hydrologic approach used may vary between riverine and lake settings. In either case, the extent to which hydrology was considered in the OHWM delineation and the methodology and source of data used should all be thoroughly documented.

3.4.1 Riverine

In a riverine setting, the availability of stream flow data should be determined. The United States Geologic Survey operates a national network of stream gaging stations. The data collected at stations in North Dakota is available at http://nd.water.usgs.gov/. This site contains real time streamflow data for select sites and historic data for all sites. The data is also published annually in hard copy data reports (Reference 14).

If a stream gage is located within reasonable proximity to the area being delineated, the streamflow record can be reviewed for utility in the delineation process. In a situation where other physical indicators were available for delineation purposes, the streamflow record should be evaluated to determine whether any recent large or extraordinary flood events might have been responsible for wrack or debris lines which do not reflect an 'ordinary' high water mark. Typically, however, vegetation indicators would not be significantly influenced by one extraordinary event.

Additionally, an available streamflow record could be used to determine a flow that constitutes an ordinarily high event. While limited research has been done to equate statistical hydrology to ordinary high water mark delineations, work completed for the State of Washington suggests that the ordinary high flow is generally equivalent to a 1.0 to 1.75-year recurrence peak flow (Reference 11). If a sufficient period of record is available to fit a frequency distribution to the peak flow data record, efforts should be made to do so in accordance with Bulletin 17B (Reference 2).

If the gaging station is immediately adjacent to the site being delineated, the water surface elevation corresponding to the 1.0 to 1.75-year peak flow can be determined from the stage-discharge rating curve for that site. If the gaging station is some distance away, it may be necessary to perform a step-backwater analysis or site specific normal depth analysis to extrapolate the stage corresponding to the ordinary high discharge at the specific site being delineated. In some instances, functioning step-backwater hydraulic models may be available, having been developed for Flood Insurance Studies or other investigations.

3.4.2 Lakes

The hydrology of lakes in North Dakota is widely varied. A lake may have a fixed outlet elevation and may naturally spill to a stream or down-gradient lake during wetter periods. In such a case, the OHWM may be at, or slightly above, the outlet elevation. However, in other instances, a lake may be entirely in a closed basin, rarely or never spilling water. Also, some lakes are hydrologically connected to aquifer systems and may simply constitute a window into an aquifer. In other cases, lakes may not interact to any significant extent with a ground water system and may be fed solely by precipitation and runoff.

In a lake setting, the likelihood of long term stage data being available is greatly diminished, although some lakes do have records published by the USGS, and those records would be available on the same link as provided for streamflow data (Reference 14). Various hydrologic components can be estimated using data published within the SCS's Hydrology Manual for North Dakota. Charts are available for estimating the volume of runoff to be expected at least 50 years out of 100 and 80 years out of 100, and the percentage of the annual runoff typically resulting from snow-melt is also available. Average annual precipitation and evaporation from lakes can also be estimated from this manual (Reference 1). With this data, a water balance could be developed.

Elevation-area-capacity information may be estimated from available topographic data. In other instances, the North Dakota Game and Fish Department may have used soundings to develop such relationships for lakes with a fishery resource, and that information may be available upon request or may be found at http://www.gf.nd.gov/fishing/lakedata.html (Reference 17).

If a lake has a fixed outlet elevation, the runoff and precipitation data available in the Hydrology Manual coupled with elevation-area-capacity data can be used to estimate the anticipated raise in lake level from a typical snow-melt event. In those instances where a more detailed analysis is appropriate, a rainfall/runoff model such as HEC-1 (Reference 15) or HEC-HMS (Reference 16) may be used to quantify the runoff and affect on lake levels resulting from a 1.0 to 1.75-year precipitation or snow-melt event.

The extent to which hydrology was considered in the delineation and the methodology and source of data used should be thoroughly documented.

3.5 Other Considerations

In addition to the use of the specific indicators described above and the required documentation discussed in the following section, there are other considerations that should be taken into account in an OHWM delineation process. One such consideration is the statewide variability across the various eco-regions of North Dakota. Clearly, the Red River valley of eastern North Dakota is a vastly different geologic setting than the prairie-pothole region of the Missouri Coteau in the central portion of the state and the badlands of the Little Missouri River watershed in the west. This variability in geologic and morphologic setting will also be apparent, to some degree, in the types of indicators available for OHWM delineations.

The wetland vegetative communities that may be prevalent in the east may be replaced by completely different communities in the west. While no specific vegetation species sub-lists have been developed for the various eco-regions in the state, the delineator needs to keep this variability in mind. Soil types will similarly vary widely between the eastern, central and western parts of the state, based on the parent material from which it was formed. Other physical indicators may exhibit similar variability between the low gradient prairie streams of the east and the higher gradient streams of the Missouri River system.

The variability in geographic scale between various river systems is another important consideration. The lower James River and the Red River of the North are both streams that the courts have determined to be navigable. Yet, these streams vary greatly in scale and morphologic characteristics from larger river systems like the Missouri and the Yellowstone. The stage on the Missouri River at Bismarck typically varies about eight feet on an annual basis. Because of the width of this large river and the preponderance of various sandbars and islands, the OHWM may actually be located several hundred yards from the apparent stream bank at the time of the delineation. Thus, the delineator needs to take a 'wider angle view' when completing delineations on these large systems compared to other navigable streams within the state. The example photos in **Appendix C** illustrate the geographic variability.

On rivers like the Missouri and Yellowstone, the stream may be split or braided. The delineator needs to recognize that the significant variability in flow for some of these larger western streams probably results in a situation where the various braids are united in one much larger channel when the river is ordinarily high. Thus it would be appropriate to search for an OHWM outside of all the various braids rather than looking for an OHWM between each braided channel. Photo #21 in **Appendix C** illustrates an example of a braided channel.

Islands are another important consideration. Islands may or may not be sovereign land depending on when they were formed and the manner in which they formed. Regardless of whether or not they are sovereign land, there may be areas within an island that have risen above the OHWM of the river. Depending on the purpose and scope of the

delineation, the delineator may need to examine island areas for indicators of an OHWM. Photos #2 and #21 in **Appendix C** illustrate an example of an island.

Another important clue as to the location of the OHWM stems from the ND Supreme Court language indicating that the value of land below the OHWM will have been destroyed for agricultural purposes by the frequent inundation. The delineator should evaluate whether the area is suitable for use in growing ordinary agricultural crops. In some areas of the state, where agricultural property values are relatively high, the area would likely already be cultivated if it were suitable.

The delineator also needs to be cognizant of the fact that the OHWM is an ambulatory line; it moves over time with changes in climatic conditions. These changes typically occur over long periods of time. Changes may occur in limited areas from year to year, but such short term changes are not common. The ND Supreme Court has also recognized that the OHWM may move in response to man-made changes such as the construction and operation of dams.

The density of delineation points or transects required is another important consideration. Obviously, if the OHWM is to be determined for only a specific lot or other smaller tract of land, a single transect will likely be sufficient. If the OHWM is being delineated for a reach of river, several transects may be required, as the location and elevation of the OHWM will likely vary along that reach. If the OHWM is being delineated for a lake, multiple points should be evaluated, but the OHWM should be represented by a single elevation for the entire lake. It is possible that different indicators may be present in different locations, and consideration of these additional indicators will be beneficial to the delineation process. The density of transects or points required to complete a specific delineation will, in most instances, be left to the professional judgment of the delineator, but it is a component of the project that should be carefully considered prior to initiating field work, and, in the case of delineations completed by a contractor, should be discussed as part of the project scoping process.

3.6 Documentation

All of the data, analyses, and judgment used to complete a delineation should be carefully and thoroughly documented. The data form included in **Appendix A** should be completed for all of the indicators used in the delineation. Several areas are provided on the form for explanatory notations. Again, the Office of the State Engineer will only recognize delineations conducted by qualified staff members or by other qualified professionals hired or approved by the State Engineer.

All background data supporting the delineation should accompany the data form. This should include a topographic or photographic map clearly illustrating the general area of the delineation as well as the resulting location of the OHWM. Any survey or GPS data collected to locate the OHWM should also be provided in either digital or hard copy format. Any hydrologic data used in the delineation should be provided along with the source of the data and any resulting analyses.

Photographs illustrating the indicators should be provided whenever possible. This may include photographs of vegetation, soil, and other physical indicators, as well as photographs illustrating the results of the delineation.

If the area provided on the form for explanatory notes is inadequate or the area being delineated is substantial, narrative explanation in addition to what can be included on the form should be provided. This could simply be in the form of an explanatory letter, technical memorandum, or, in the case of a very large delineation, a bound report may be appropriate.

4.0 List of References

1. United States Soil Conservation Service, United States Department of Agriculture, Hydrology Manual for North Dakota, Revised 1980.

2. Water Resources Council, Bulletin 17B, Guidelines for Determining Flood Flow Frequency, Revised September 1981 and March 1982.

3. U.S. Army Corp of Engineers, Corps of Engineers Wetlands Delineation Manual, Wetlands Research Program Technical Report Y-87-1 (online edition), January 1987. Available at: http://www.wetlands.com/regs/tlpge02e.htm

4. U.S. Fish and Wildlife Service, National List of Plant Species that Occur in Wetlands (online edition), 1988. Available at: http://www.fws.gov/nwi/bha/list88.html

5. United States Geological Survey, Water Resources Investigations Report 92-4020, Techniques for Estimating Peak Flow Frequency Relations, 1992.

6. Minnesota Department of Natural Resources Waters, Guidelines for Ordinary High Water Level (OHWL) Determinations, June, 1993.

7. North Dakota State Engineer, Sovereign Land Management Statutes and Rules, February, 1997.

8. State ex rel. Sprynczynatyk v. Mills, 1999 ND 75, 13, 592 N.W. 2d 591.

9. Harris County Flood Control District, Ordinary High Water Mark Delineation Manual for Section 404 Waters, October, 2005.

10. North Dakota State Water Commission, North Dakota Water Laws, 2005.

11. Washington Department of Ecology, Washington Department of Fish and Wildlife, Methods for Delineation of Ordinary High Water Lines (OHWL) and Ordinary High Water Marks (OHWM) for Natural Resources Plans and Permits, Draft Copy, June, 2006.

12. North Dakota State Engineer, North Dakota Sovereign Land Management Plan, 2007.

13. State of Wisconsin, Waterway and Wetland Handbook, Chapter 40, Ordinary High Water Mark.

14. United States Geological Survey, Water Resource Data Reports, Available at: http://nd.water.usgs.gov/.

15. U.S. Army Corps of Engineers, Hydrologic Engineering Center, Computer Program, HEC-1.

16. U.S. Army Corps of Engineers, Hydrologic Modeling System, Computer Program, HEC-HMS.

17. North Dakota Game and Fish Department, Lake Contour Maps, http://www.gf.nd.gov/fishing/lakedata.html.

APPENDIX A

Delineation Data Form

ORDINARY HIGH WATER MARK DELINEATION
DATA FORM

GENERAL	
Date:	Map provided? _____Yes _____ No
Delineator(s):	Riparian Landowner:
Water Body:	Transect:
Legal Description:	Notes:
County:	

VEGETATION							
BELOW OHWM				**ABOVE OHWM**			
Dominant Plant Species	% Cover	Indicator	Stratum	Dominant Plant Species	% Cover	Indicator	Stratum
% of dominant species that are OBL, FACW, and/or FAC?				% of dominant species that are OBL, FACW, and/or FAC?			
Evidence of vegetation stress:				Destruction of terrestrial vegetation:			
Notes:							

SOILS							
Change in appearance of soil surface:				Evidence of sediment deposition:			
Evidence of shelving along bank:				Organic matter present on surface:			
Evidence of rippling effect:				Evidence of erosion:			
Section below is optional and for use ONLY if delineator is a Licensed Soil Classifier in the State of North Dakota							
BELOW OHWM				**ABOVE OHWM**			
Depth	Texture	Matrix Color	Mottles	Depth	Texture	Matrix Color	Mottles
Hydric Soils Present?				Hydric Soils Present?			
Notes:							

HYDROLOGY	
STREAM	**LAKE**
USGS Gaging Station:	Watershed Yield 80yr/100yr: 50yr/100yr:
1-yr Flood elevation:	Outlet Elevation:
2-yr Flood elevation:	Surface Area:
Recent Atypical Flood Event?	Evaporative Loss:
	Average Annual Precipitation:
Notes:	

OTHER PHYSICAL INDICATORS
Ice scars:
Pollen or algae staining:
Water stain:
Wrack:
Describe other:
Notes:

RESULTS
Elevation of OHWM:
Elevation Determined By: Field Survey Remote GPS
Notes:

Note to Users: Delineation forms should be completed by State Engineer designated delineators or Office of the State Engineer staff. It is important that the delineation be documented to the maximum extent possible. Please complete this form providing as much of the data requested as possible. Additional insight as to the methodologies and expectations are provided in the Ordinary High Water Mark Delineation Guidelines. This form should be forwarded along with all supporting documentation, including any pertinent maps and photos to: The Office of the State Engineer, 900 East Boulevard, Bismarck, ND 58505-0850.

APPENDIX B

Region 4 Wetland Vegetation Species

REGION 4 LIST OF PLANTS THAT OCCUR IN WETLANDS				REGION 4 LIST OF PLANTS THAT OCCUR IN WETLANDS			
Scientific Name	**Common Name**	**National Range Of Indicators**	**Regional Indicator**	**Scientific Name**	**Common Name**	**National Range Of Indicators**	**Regional Indicator**
Abutilon theophrasti	VELVET-LEAF	UPL,FACU-	UPL	Amaranthus retroflexus	AMARANTH,RED-ROOT	FACU-,FAC-	FACU
Acalypha rhomboidea	COPPER-LEAF,COMMON	UPL,FAC-	FACU-	Amaranthus rudis	AMARANTH,TALL	FACU-,FACW	FAC
Acalypha virginica	MERCURY,THREE-SEEDED	UPL,FACU	FACU-	Amaranthus tuberculatus	AMARANTH,ROUGH-FRUIT	FACW,OBL	OBL
Acer glabrum	MAPLE,ROCKY MOUNTAIN	FACU,FAC	FAC	Ambrosia artemisiifolia	RAGWEED,ANNUAL	FACU-,FACU+	FACU
Acer negundo	BOX-ELDER	FAC,FACW	FAC	Ambrosia psilostachya	RAGWEED,NAKED-SPIKE	FACU-,FAC	FAC
Acer saccharinum	MAPLE,SILVER	FAC,FACW	FACW	Ambrosia trifida	RAGWEED,GREAT	FAC,FACW	FAC
Acer saccharum	MAPLE,SUGAR	UPL,FACU	FACU	Amelanchier alnifolia	SERVICE-BERRY,SASKATOON	UPL,FAC-	FACU
Achillea millefolium	YARROW,COMMON	FACU	FACU	Ammannia auriculata	AMMANNIA,RED-STEM	OBL	OBL
Aconitum columbianum	MONKSHOOD,COLUMBIA	FACW	FACW	Ammannia coccinea	AMMANNIA,PURPLE	FACW+,OBL	OBL
Acorus calamus	SWEETFLAG	OBL	OBL	Amorpha fruticosa	INDIGO-BUSH,FALSE	FAC,OBL	FACW
Adiantum capillus-veneris	FERN,SOUTHERN MAIDEN-HAIR	FACU,FACW+	FACW	Amorpha nana	INDIGO-BUSH,FRAGRANT	FACU?	NI
Adiantum pedatum	FERN,NORTHERN MAIDEN-HAIR	FACU,FAC	FAC	Amphicarpaea bracteata	HOG-PEANUT,AMERICAN	FACU,FACW	FACU
Adoxa moschatellina	MUSK-ROOT	FACU,FAC	FAC	Anagallis arvensis	PIMPERNEL,SCARLET	UPL,FACW-	NI
Aesculus glabra	BUCKEYE,OHIO	FACU,FAC+	NI	Andropogon gerardii	BLUESTEM,BIG	FACU,FAC	FACU
Agalinis aspera	FALSE-FOXGLOVE,ROUGH PURPLE	FACU,FAC	FACU	Androsace occidentalis	ROCK-JASMINE,WESTERN	FACU-,FACU	FACU
Agalinis tenuifolia	FALSE-FOXGLOVE,SLENDER	FACU,FACW	FACW	Androsace septentrionalis	ROCK-JASMINE,PYGMY-FLOWER	UPL,FAC-	FACU+
Agastache nepetoides	GIANT-HYSSOP,YELLOW	FACU,FAC	FAC	Anemone canadensis	THIMBLE-WEED,CANADA	FAC,FACW	FACW
Ageratina altissima	SNAKEROOT,WHITE	UPL,FAC	FAC	Anemone quinquefolia	THIMBLE-WEED,AMERICAN WOODLAND	FACU,FAC	NI
Agoseris glauca	FALSE-DANDELION,PALE	FACU,FAC	FAC	Anemone virginiana	THIMBLE-WEED,TALL	NI	NI
Agrimonia gryposepala	GROOVEBUR,TALL HAIRY	FACU,FACW-	FAC	Anthemis cotula	MAYWEED	UPL,FACU+	FACU
Agrimonia parviflora	GROOVEBUR,SMALL-FLOWER	FAC,FACW	FAC	Apios americana	POTATO-BEAN,AMERICAN	FAC,FACW	FACW
Agrimonia striata	GROOVEBUR,WOODLAND	FACU-,FAC	FACU	Apocynum cannabinum	DOGBANE,CLASPING-LEAF	FACU,FAC+	FAC
Agrohordeum x macounii	WILDRYE,MACOUN	FACU,FAC	FAC	Apocynum sibiricum	DOGBANE,PRAIRIE	FAC-,FAC+	FAC
Agropyron caninum	WHEATGRASS,CUTTING	FACU,FAC	FAC	Aquilegia canadensis	COLUMBINE,WILD	FAC-,FACW	FAC
Agropyron dasystachyum	WHEATGRASS,THICK-SPIKE	UPL,FAC	FAC	Arabis divaricarpa	ROCKCRESS,LIMESTONE	FACU	FACU
Agropyron repens	QUACKGRASS	UPL,FAC	FAC	Arabis drummondii	ROCKCRESS,DRUMMOND'S	FACU	FACU
Agropyron smithii	WHEATGRASS,WESTERN	UPL,FAC-	FACU	Arabis hirsuta	ROCKCRESS,HAIRY	FACU	FACU
Agropyron spicatum	WHEATGRASS,BLUE-BUNCH	UPL,FACU	FACU-	Arabis holboellii	ROCKCRESS,HOLBOELL'S	UPL,FACU	FACU
Agropyron trachycaulum	WHEATGRASS,SLENDER	FACU,FAC	FACU	Aralia nudicaulis	SARSAPARILLA,WILD	FACU,FAC	FACU
Agrostis alba	REDTOP	FACW,OBL	FACW	Arctostaphylos uva-ursi	BEARBERRY	UPL,FACU	FACU-
Agrostis exarata	BENTGRASS,SPIKE	FACW	FACW	Arenaria serpyllifolia	SANDWORT,THYME-LEAF	FACU,FAC	FAC
Agrostis gigantea	BENTGRASS,BLACK	FAC?	NI	Arisaema triphyllum	JACK-IN-THE-PULPIT,SWAMP	FAC,FACW	FACW
Agrostis hyemalis	BENTGRASS,WINTER	FACU,FACW	FACW	Aristida dichotoma	GRASS,SHINNERS' THREE-AWN	UPL,FACU	NI
Agrostis perennans	BENTGRASS,PERENNIAL	FACU,FACW	FACW	Aristida longespica	GRASS,SLIM-SPIKE THREE-AWN	UPL,FACU	NI
Agrostis scabra	BENTGRASS,ROUGH	FAC,FAC+	FAC	Armoracia rusticana	HORSERADISH	FAC	NI
Agrostis stolonifera	BENTGRASS,SPREADING	FAC+,FACW	FAC+	Arnoglossum plantagineum	INDIAN-PLANTAIN,GROOVE-STEM	FACU,FACW	NI
Alisma gramineum	WATER-PLANTAIN,NARROW-LEAF	OBL	OBL	Arrhenatherum elatius	OATGRASS,TALL	UPL,FACU	FACU
Alisma plantago-aquatica	WATER-PLANTAIN,BROAD-LEAF	OBL	OBL	Artemisia annua	WORMWOOD,ANNUAL	UPL,FACU	NI
Alisma subcordatum	WATER-PLANTAIN,SUBCORDATE	OBL	OBL	Artemisia biennis	WORMWOOD,BIENNIAL	FACU-,FACW	FAC
Alliaria petiolata	MUSTARD,GARLIC	FACU-,FACW	FACU	Artemisia cana	SAGEBRUSH,SILVER	FACU,FACW	FACU
Allium canadense	ONION,MEADOW	FACU-,FACU	FACU	Artemisia ludoviciana	SAGEBRUSH,WHITE	UPL,FACU	FACU
Allium geyeri	ONION,GEYER	FACU	FACU	Asclepias incarnata	MILKWEED,SWAMP	FACW+,OBL	OBL
Allium tricoccum	LEEK,SMALL WHITE	FACU,FAC	FACU	Asclepias speciosa	MILKWEED,SHOWY	FAC,FACW	FAC
Alnus incana	ALDER,SPECKLED	FACU,FACW	FACW	Asclepias subverticillata	MILKWEED,WESTERN WHORLED	UPL,FACU	NI
Alnus rugosa	ALDER,SPECKLED	FAC,OBL	FACW	Asparagus officinalis	ASPARAGUS-FERN,GARDEN	FACU-,FACU	FACU
Alopecurus aequalis	FOXTAIL,SHORT-AWN	OBL	OBL	Asplenium trichomanes-ramosum	SPLEENWORT,GREEN	UPL,FACU	FACU
Alopecurus arundinaceus	FOXTAIL,CREEPING	FACW?	NI	Aster brachyactis	ASTER,RAYLESS ALKALI	FAC,FACW	FACW
Alopecurus carolinianus	FOXTAIL,TUFTED	FAC+,FACW	FACW	Aster chilensis	ASTER,COMMON CALIFORNIA	FACU,FACW-	NI
Alopecurus geniculatus	FOXTAIL,MEADOW	FACW+,OBL	OBL	Aster eatonii	ASTER,EATON	FAC,FAC+	NI
Alopecurus pratensis	FOXTAIL,MEADOW	FAC,FACW	FACW	Aster ericoides	ASTER,WHITE HEATH	UPL,FACU	FACU
Althaea officinalis	MARSH-MALLOW,COMMON	FACW+	NI	Aster falcatus	ASTER,WHITE PRAIRIE	FACU-,FAC	FACU
Amaranthus albus	AMARANTH,WHITE	FACU-,FACU	FACU	Aster hesperius	ASTER,SISKIYOU	OBL	OBL
Amaranthus arenicola	AMARANTH,SANDHILLS	UPL,FAC	FACU	Aster junciformis	ASTER,RUSH	OBL	OBL
Amaranthus blitoides	AMARANTH,PROSTRATE	FACU,FACW	FAC	Aster lateriflorus	ASTER,CALICO	FAC,FACW+	FACW

REGION 4 LIST OF PLANTS THAT OCCUR IN WETLANDS				REGION 4 LIST OF PLANTS THAT OCCUR IN WETLANDS			
Scientific Name	**Common Name**	**National Range Of Indicators**	**Regional Indicator**	**Scientific Name**	**Common Name**	**National Range Of Indicators**	**Regional Indicator**
Aster lucidulus	ASTER,SHINING	FACW,FACW+	FACW	Botrychium multifidum	GRAPEFERN,LEATHERY	FACU,FAC	FAC
Aster novae-angliae	ASTER,NEW ENGLAND	FACW-,FACW	FACW	Botrychium simplex	GRAPEFERN,LEAST	FACU,FAC	FAC
Aster ontarionis	ASTER,ONTARIO	FAC	FAC	Botrychium virginianum	FERN,RATTLESNAKE	FACU	FACU
Aster pansus	ASTER,MANY-FLOWERED	FACU,FAC+	FAC	Brasenia schreberi	WATERSHIELD	OBL	OBL
Aster pauciflorus	ASTER,ALKALI MARSH	FACW	FACW	Bromus ciliatus	BROME,FRINGED	FACU,FACW	FAC
Aster pilosus	ASTER,WHITE HEATH	UPL,FAC-	UPL	Bromus japonicus	BROME,JAPANESE	UPL,FACU	FACU
Aster puniceus	ASTER,SWAMP	OBL	OBL	Bromus kalmii	BROME,KALM'S	FACU-,FAC	FACU+
Aster sibiricus	ASTER,SIBERIAN	FAC	NI	Bromus latiglumis	BROME,EARLEAF	FACW-,FACW+	FACW
Aster simplex	ASTER,PANICLED	FACW	FACW	Bromus mollis	BROME,SOFT	UPL,FACU-	UPL
Aster tradescanti	ASTER,TRADESCANT	FAC+,FACW	FACW	Bromus purgans	BROME,CANADA	FACU,FACU+	FACU
Aster umbellatus	ASTER,FLAT-TOP WHITE	FACW,OBL	FACW+	Buchloe dactyloides	GRASS,BUFFALO	FACU-,FACU	FACU-
Aster x lanceolatus	ASTER,WHITE PANICLE	NI	NI	Bulbostylis capillaris	HAIRSEDGE,DENSE-TUFT	FACU,FAC	NI
Astragalus agrestis	MILKVETCH,FIELD	FACU,FACW-	FACU	Butomus umbellatus	FLOWERING-RUSH	OBL	OBL
Astragalus alpinus	MILKVETCH,ALPINE	FACU,FAC	FAC	Calamagrostis canadensis	REEDGRASS,BLUE-JOINT	FAC,OBL	FACW+
Astragalus americanus	MILKVETCH,AMERICAN	FAC	FAC	Calamagrostis epigeios	REEDGRASS,CHEE	FAC	NI
Astragalus bodinii	MILKVETCH,BODIN'S	FACU-,FACW-	NI	Calamagrostis inexpansa	SMALL-REEDGRASS,NARROW-SPIKE	FACW,FACW+	FACW
Astragalus canadensis	MILKVETCH,CANADA	FACU,FACW	FACU	Calamagrostis neglecta	REEDGRASS,SLIMSTEM	FACW,OBL	OBL
Astragalus neglectus	MILKVETCH,COOPER'S	UPL,FACU	UPL	Calla palustris	CALLA,WILD	OBL	OBL
Athyrium filix-femina	FERN,SUBARCTIC LADY	FAC,FAC+	FAC	Callitriche hermaphroditica	WATER-STARWORT,AUTUMNAL	OBL	OBL
Atriplex argentea	SALTBUSH,SILVER-SCALE	FACU,FAC	FACU	Callitriche heterophylla	WATER-STARWORT,LARGER	OBL	OBL
Atriplex canescens	SALTBUSH,FOUR-WING	UPL,FACU	FACU-	Callitriche verna	WATER-STARWORT,SPINY	OBL	OBL
Atriplex falcata	SALTBUSH,SICKLE	UPL,FACW	NI	Caltha palustris	MARSH-MARIGOLD,COMMON	OBL	OBL
Atriplex hortensis	ORACHE,GARDEN	UPL,FACW	FAC	Calypso bulbosa	SLIPPER,FAIRY	FACU,FACW	FACW
Atriplex patula	SALTBUSH,HALBERD-LEAF	FAC,FACW	FACW	Calystegia sepium	BINDWEED,HEDGE	FACU,OBL	FAC
Atriplex rosea	ORACHE,TUMBLING	FACU-,FACU+	FACU	Camelina sativa	FALSE-FLAX,LARGE-SEED	UPL,FAC	FACU
Bacopa rotundifolia	WATER-HYSSOP,DISK	OBL	OBL	Campanula americana	BELLFLOWER,AMERICAN	FAC	FAC
Barbarea orthoceras	WINTER-CRESS,AMERICAN	FACW,OBL	OBL	Campanula aparinoides	BELLFLOWER,MARSH	OBL	OBL
Barbarea vulgaris	ROCKET,YELLOW	FACU,FACW	FAC	Campanula rotundifolia	BELLFLOWER,SCOTCH	UPL,FAC	FAC
Bassia hyssopifolia	SMOTHER-WEED,FIVE-HORN	FAC,FACW	FACW	Campsis radicans	TRUMPET-CREEPER	FACU,FAC	FACU
Beckmannia eruciformis	GRASS,BECKMANN'S	OBL	NI	Cannabis sativa	MARIJUANA	FACU-,FAC	FAC-
Beckmannia syzigachne	SLOUGHGRASS,AMERICAN	OBL	OBL	Capsella bursa-pastoris	PURSE,COMMON SHEPHERD'S	FACU,FAC	FACU
Berberis thunbergii	BARBERRY,JAPANESE	UPL,FACU	UPL	Cardamine bulbosa	BITTER-CRESS,BULBOUS	OBL	OBL
Berberis vulgaris	BARBERRY,EUROPEAN	UPL,FACU	UPL	Cardamine concatenata	TOOTHWORT,CUT-LEAF	FACU	FACU
Bergia texana	BERGIA,TEXAS	OBL	OBL	Cardamine pensylvanica	BITTER-CRESS,PENNSYLVANIA	FACW,OBL	OBL
Berula erecta	PARSNIP,CUT-LEAF WATER	OBL	OBL	Carex aenae	SEDGE,BRONZE	FACW?	NI
Betula alba	BIRCH,WHITE	FACU,FAC+	NI	Carex alopecoidea	SEDGE,FOXTAIL	FACW,OBL	OBL
Betula glandulosa	BIRCH,TUNDRA DWARF	FAC,OBL	OBL	Carex amphibola	SEDGE,NARROW-LEAF	FAC,OBL	FAC+
Betula occidentalis	BIRCH,SPRING	FAC,FACW	FACW	Carex aquatilis	SEDGE,WATER	OBL	OBL
Betula papyrifera	BIRCH,PAPER	FACU,FACU+	FACU	Carex atherodes	SEDGE,SLOUGH	OBL	OBL
Betula pumila	BIRCH,BOG	OBL	OBL	Carex athrostachya	SEDGE,SLENDER-BEAK	FAC,FACW	FACW
Betula x sandbergii	BIRCH,SANDBERG'S	OBL	OBL	Carex aurea	SEDGE,GOLDEN-FRUIT	FACW,OBL	FACW
Bidens cernua	BEGGAR-TICKS,NODDING	FACW+,OBL	OBL	Carex bebbii	SEDGE,BEBB'S	OBL	OBL
Bidens comosa	BEGGAR-TICKS,LEAFY-BRACT	FACW	FACW	Carex bella	SEDGE,SHOWY	FACU,FAC-	FAC-
Bidens connata	BEGGAR-TICKS,PURPLE-STEM	FACW+,OBL	FACW+	Carex bicknellii	SEDGE,BICKNELL'S	FACU,FACW	FACW
Bidens coronata	BEGGAR-TICKS,LARGE-FRUIT	OBL	OBL	Carex blanda	SEDGE,WOODLAND	FACU+,FAC	FACU+
Bidens frondosa	BEGGAR-TICKS,DEVIL'S	FACW,FACW+	FACW	Carex brevior	SEDGE,SHORT-BEAK	UPL,OBL	FACU
Bidens tripartita	BEGGAR-TICKS,THREE-LOBE	FACW,OBL	NI	Carex brunnescens	SEDGE,BROWNISH	FAC,OBL	FAC
Boehmeria cylindrica	FALSE-NETTLE,SMALL-SPIKE	FACW,OBL	OBL	Carex buxbaumii	SEDGE,BROWN BOG	FACW,OBL	OBL
Boisduvalia glabella	SPIKE-PRIMROSE,SMOOTH	FACW,OBL	FACW	Carex canescens	SEDGE,HOARY	FACW+,OBL	OBL
Boltonia asteroides	BOLTONIA,WHITE	FACW,OBL	FACW	Carex capillaris	SEDGE,HAIR-LIKE	FACW	FACW
Botrychium lunaria	MOONWORT	FAC,FACW	FAC	Carex chordorrhiza	SEDGE,CREEPING	OBL	NI
Botrychium matricariifolium	MOONWORT,DAISY-LEAF	FACU	FACU	Carex comosa	SEDGE,BEARDED	OBL	OBL

REGION 4 LIST OF PLANTS THAT OCCUR IN WETLANDS				REGION 4 LIST OF PLANTS THAT OCCUR IN WETLANDS			
Scientific Name	**Common Name**	**National Range Of Indicators**	**Regional Indicator**	**Scientific Name**	**Common Name**	**National Range Of Indicators**	**Regional Indicator**
Carex concinna	SEDGE,LOW NORTHERN	FACU,FAC	FACU	Carex stricta	SEDGE,UPTIGHT	OBL	OBL
Carex conjuncta	SEDGE,SOFT FOX	FAC,FACW	FAC+	Carex sychnocephala	SEDGE,MANY-HEAD	FACW,FACW+	FACW
Carex crawei	SEDGE,CRAWE'S	FACW,OBL	FACW	Carex tenera	SEDGE,SLENDER	FACU+,FACW	FACW
Carex cristatella	SEDGE,CRESTED	FAC,FACW+	FACW	Carex tetanica	SEDGE,RIGID	FACW,FACW+	FACW
Carex davisii	SEDGE,DAVIS'	FACU,FAC+	FAC	Carex torreyi	SEDGE,TORREY'S	UPL,FAC	UPL
Carex deweyana	SEDGE,SHORT-SCALE	UPL,FACW	FACU	Carex vesicaria	SEDGE,INFLATED	OBL	OBL
Carex diandra	SEDGE,LESSER PANICLED	OBL	OBL	Carex viridula	SEDGE,LITTLE GREEN	FACW+,OBL	OBL
Carex disperma	SEDGE,SOFT-LEAF	FACW,OBL	FACW	Carex vulpinoidea	SEDGE,FOX	OBL	OBL
Carex douglasii	SEDGE,DOUGLAS'	FACU,FAC	FACU	Carex x molesta	SEDGE,TROUBLESOME	FACU,FACW	FACW
Carex eburnea	SEDGE,BRISTLE-LEAF	FACU-,FACU+	FACU	Carex x stipata	SEDGE,STALK-GRAIN	OBL	OBL
Carex emoryi	SEDGE,EMORY'S	OBL	OBL	Carya ovata	HICKORY,SHAG-BARK	FACU-,FACU+	FACU
Carex festucacea	SEDGE,FESCUE	FAC,FACW	FACW	Cassia fasciculata	PEA,PARTRIDGE	FACU-,FACU	FACU
Carex foenea	SEDGE,DRY-SPIKE	FAC+?	NI	Castilleja miniata	INDIAN-PAINTBRUSH,SCARLET	FACU,FACW	FAC
Carex formosa	SEDGE,HANDSOME	FAC,FACW-	NI	Castilleja sulphurea	INDIAN-PAINTBRUSH,SULPHUR	FACU,FACW-	FAC
Carex garberi	SEDGE,ELK	FACW-,FACW	FACW	Catabrosa aquatica	BROOKGRASS	OBL	OBL
Carex gracillima	SEDGE,GRACEFUL	FACU	NI	Catalpa speciosa	CATALPA,NORTHERN	FACU,FAC	FACU
Carex granularis	SEDGE,MEADOW	FACW,OBL	OBL	Celastrus scandens	BITTER-SWEET,AMERICAN	UPL,FACU	NI
Carex gynocrates	SEDGE,NORTHERN BOG	OBL	OBL	Celtis occidentalis	HACKBERRY,COMMON	FACU,FAC	FACU
Carex hallii	SEDGE,DEER	FAC,OBL	FAC	Centaurium exaltatum	CENTAURY,TALL	FACW,OBL	NI
Carex haydenii	SEDGE,CLOUD	FACW+,OBL	OBL	Centunculus minimus	CHAFFWEED	FACU-,OBL	OBL
Carex hoodii	SEDGE,HOOD'S	FAC?	NI	Cerastium arvense	CHICKWEED,MOUSE-EAR	UPL,FACW	FACU
Carex hystericina	SEDGE,PORCUPINE	OBL	OBL	Cerastium brachypodum	CHICKWEED,SHORT-STALK	FACU-,FAC	FACU
Carex interior	SEDGE,INLAND	FACW-,OBL	OBL	Cerastium nutans	CHICKWEED,NODDING	FACU,FAC	FACU
Carex intumescens	SEDGE,BLADDER	FACW,OBL	OBL	Cerastium vulgatum	CHICKWEED,COMMON MOUSE-EAR	FACU-,FAC-	FACU
Carex lacustris	SEDGE,LAKEBANK	OBL	OBL	Ceratophyllum demersum	HORNWORT,COMMON	OBL	OBL
Carex laeviconica	SEDGE,SMOOTH-CONE	OBL	OBL	Chamaesyce serpens	BROOM-SPURGE,MATTED	UPL,FACW	UPL
Carex lanuginosa	SEDGE,WOOLY	OBL	OBL	Chenopodium album	GOOSEFOOT,WHITE	FACU,FAC	FAC
Carex lasiocarpa	SEDGE,WOOLLY-FRUIT	OBL	OBL	Chenopodium ambrosioides	WORMSEED,AMERICAN	FACU,FAC	FAC
Carex leptalea	SEDGE,BRISTLY-STALK	OBL	OBL	Chenopodium botrys	JERUSALEM-OAK	UPL,FACU	FACU
Carex limnophila	SEDGE,APPRESSED	FACW,OBL	NI	Chenopodium fremontii	GOOSEFOOT,FREMONT'S	UPL,FAC	FACU
Carex limosa	SEDGE,MUD	OBL	NI	Chenopodium glaucum	GOOSEFOOT,OAKLEAF	FAC,FACW	FACW
Carex lupulina	SEDGE,HOP	FACW+,OBL	NI	Chenopodium humile	PIGWEED,MARSHLAND	FAC+	FAC+
Carex meadii	SEDGE,MEAD'S	FACU,OBL	FACU	Chenopodium leptophyllum	GOOSEFOOT,NARROW-LEAF	UPL,FAC	UPL
Carex microptera	SEDGE,SMALL-WING	FAC,FACW	FAC	Chenopodium rubrum	GOOSEFOOT,COAST-BLITE	FACW,OBL	OBL
Carex nebrascensis	SEDGE,NEBRASKA	OBL	OBL	Chenopodium salinum	PIGWEED,ROCKY MOUNTAIN	UPL,FACU	NI
Carex normalis	SEDGE,LARGER STRAW	FACU,OBL	FAC	Cicuta bulbifera	WATER-HEMLOCK,BULBLET-BEARING	OBL	OBL
Carex parryana	SEDGE,PARRY'S	FAC+,FACW	FACW	Cicuta maculata	WATER-HEMLOCK,SPOTTED	OBL	OBL
Carex praegracilis	SEDGE,CLUSTERED FIELD	FACW-,FACW+	FACW	Cinna arundinacea	WOOD-REEDGRASS,STOUT	FACW,FACW+	FACW
Carex prairea	SEDGE,PRAIRIE	FACW,OBL	OBL	Cinna latifolia	WOOD-REEDGRASS,SLENDER	FACW,OBL	OBL
Carex praticola	SEDGE,NORTHERN MEADOW	FACU,FACW	FAC+	Circaea alpina	NIGHTSHADE,SMALL ENCHANTER'S	FAC,FACW	FACW
Carex pseudocyperus	SEDGE,CYPRESS-LIKE	OBL	OBL	Circaea lutetiana	NIGHTSHADE,SOUTHERN BROAD-LEAF ENCH	FACU	FACU
Carex retrorsa	SEDGE,RETRORSE	FAC,OBL	OBL	Cirsium arvense	THISTLE,CREEPING	FACU-,FAC	FACU
Carex richardsonii	SEDGE,RICHARDSON'S	UPL,FAC-	FAC-	Cirsium flodmanii	THISTLE,FLODMAN'S	FACU?	NI
Carex rostrata	SEDGE,BEAKED	OBL	OBL	Cicuta maculata	WATER-HEMLOCK,SPOTTED	OBL	OBL
Carex rupestris	SEDGE,CURLY	UPL,FACU	FACU	Cinna arundinacea	WOOD-REEDGRASS,STOUT	FACW,FACW+	FACW
Carex sartwellii	SEDGE,SARTWELL'S	FACW,OBL	FACW	Cinna latifolia	WOOD-REEDGRASS,SLENDER	FACW,OBL	OBL
Carex scoparia	SEDGE,POINTED BROOM	FACW	FACW	Circaea alpina	NIGHTSHADE,SMALL ENCHANTER'S	FAC,FACW	FACW
Carex simulata	SEDGE,SHORT-BEAK	FACW,OBL	OBL	Circaea lutetiana	NIGHTSHADE,SOUTHERN BROAD-LEAF ENCH	FACU	FACU
Carex sparganioides	SEDGE,BUR-REED	FACU,FAC+	NI	Cirsium arvense	THISTLE,CREEPING	FACU-,FAC	FACU
Carex sprengelii	SEDGE,LONG-BEAK	FACU,FAC	FACU	Cirsium flodmanii	THISTLE,FLODMAN'S	FACU?	NI
Carex sterilis	SEDGE,DIOECIOUS	OBL	NI	Cirsium muticum	THISTLE,SWAMP	FACW+,OBL	OBL

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Cirsium undulatum	THISTLE,WAVY-LEAF	FACU,FAC	FAC	Danthonia californica	OATGRASS,CALIFORNIA	FACU-,FACW	NI
Cirsium vulgare	THISTLE,BULL	UPL,FAC	UPL	Danthonia intermedia	OATGRASS,VASEY	FACU,FAC	FAC
Claytonia perfoliata	LETTUCE,MINER'S	FAC-,FACW	FACW	Deschampsia cespitosa	HAIRGRASS,TUFTED	FAC,FACW+	FACW
Clematis ligusticifolia	VIRGIN'S-BOWER,WESTERN	FACU,FACW	FACU	Desmanthus illinoensis	BUNDLE-FLOWER,PRAIRIE	UPL,FAC	FACU
Clematis virginiana	VIRGIN'S-BOWER,VIRGINIA	FACU,FAC+	FACU	Desmodium canadense	TICK-TREFOIL,SHOWY	FACU,FAC	FACU
Cleome lutea	SPIDER-FLOWER,YELLOW	UPL,FAC+	FACU	Dichanthelium acuminatum	GRASS,PANIC	FAC,FACW	FAC
Cleome multicaulis	SPIDER-FLOWER,MANY-STEM	FACW	NI	Dichanthelium leibergii	WITCHGRASS,LEIBERG'S	FACU,FAC	FACU
Cleome serrulata	SPIDER-FLOWER,BEE	FACU-,FAC	FACU	Dichanthelium oligosanthes	WITCHGRASS,HELLER'S	FACU,FAC	FACU
Coeloglossum viride	ORCHID,LONG-BRACT GREEN	FACU,FACW	FACU	Dichanthelium scabriusculum	GRASS,WOOLLY PANIC	OBL	NI
Collomia linearis	COLLOMIA,NARROW-LEAF	UPL,FACU	FACU	Digitaria ischaemum	CRABGRASS,SMOOTH	UPL,FAC	UPL
Comandra umbellata	TOAD-FLAX,UMBELLATE BASTARD	UPL,FACU	UPL	Digitaria sanguinalis	CRABGRASS,HAIRY	FACU-,FAC-	FACU
Commelina communis	DAYFLOWER,ASIATIC	FAC-,FAC	FAC-	Dipsacus sylvestris	TEASEL	FAC?	NI
Conioselinum chinense	HEMLOCK-PARSLEY	FAC,FACW	NI	Disporum trachycarpum	MADRIN,ROUGH-FRUIT	FAC?	NI
Conium maculatum	POISON-HEMLOCK	FAC,OBL	FAC	Distichlis spicata	SALTGRASS,SEASHORE	FAC+,FACW+	FACW
Conyza canadensis	HORSEWEED,CANADA	UPL,FAC	FACU	Distichlis spicata	SALTGRASS,INLAND	FAC+,FACW	NI
Corallorrhiza maculata	CORALROOT,SPOTTED	UPL,FAC-	FACU-	Dodecatheon pauciflorum	SHOOTING-STAR,DARK-THROAT	FACW	FACW
Corallorrhiza striata	CORALROOT,STRIPED	UPL,FACU+	UPL	Dodecatheon pulchellum	SHOOTING-STAR,FEW-FLOWER	FAC,FACW	FACW-
Corallorrhiza trifida	CORALROOT,EARLY	FAC,FACW	FAC	Draba aurea	WHITLOW-GRASS,GOLDEN	UPL,FAC	FAC
Corallorrhiza wisterana	CORALROOT,SPRING	UPL,FAC	FACU	Draba stenoloba	WHITLOW-GRASS,ALASKA	NI	NI
Coreopsis tinctoria	TICKSEED,GOLDEN	FACU,FAC	FAC	Dracocephalum parviflorum	DRAGON-HEAD,AMERICAN	FACU-,FACU	FACU
Corispermum hyssopifolium	TICK-SEED,COMMON	FACU	FACU	Dracopis amplexicaulis	CONEFLOWER,CLASPING-LEAF	FACU-,FACW	FACW
Cornus amomum	DOGWOOD,SILKY	FACW,FACW+	FACW	Drosera rotundifolia	SUNDEW,ROUND-LEAF	OBL	OBL
Cornus canadensis	BUNCHBERRY,CANADA	FACU,FAC	FAC	Dryopteris cristata	SHIELD-FERN,CRESTED	FACW,OBL	OBL
Cornus drummondii	DOGWOOD,ROUGH-LEAF	FAC	FAC	Dryopteris spinulosa	WOODFERN,SPINULOSE	FAC+,FACW	FACW
Cornus foemina	DOGWOOD,STIFF	FAC,FACW	FAC	Dulichium arundinaceum	SEDGE,THREE-WAY	OBL	NI
Cornus stolonifera	DOGWOOD,RED-OSIER	FAC,FACW+	FACW	Echinochloa crusgalli	GRASS,BARNYARD	FACU,FACW	FACW
Corylus americana	HAZEL-NUT,AMERICAN	UPL,FACU	UPL	Echinochloa muricata	GRASS,ROUGH BARNYARD	FAC,OBL	OBL
Corylus cornuta	HAZEL-NUT,BEAKED	UPL,FACU	UPL	Echinocystis lobata	MOCK-CUCUMBER,WILD	FACU,FACW-	FAC
Crataegus mollis	HAWTHORN,DOWNY	FACU,FACW-	FACU	Echinodorus rostratus	BURHEAD,UPRIGHT	OBL	OBL
Crepis runcinata	HAWKSBEARD,DANDELION	FACU,FACW	FAC	Eclipta alba	YERBA DE TAJO	FAC,OBL	OBL
Cryptotaenia canadensis	HONEWORT,CANADA	FACU,FAC+	FACU	Elaeagnus angustifolia	OLIVE,RUSSIAN	FACU-,FACW-	FAC-
Cycloloma atriplicifolium	PIGWEED,WINGED	UPL,FAC	FAC	Elaeagnus commutata	SILVER-BERRY,AMERICAN	UPL	NI
Cyperus acuminatus	FLATSEDGE,SHORT-POINT	OBL	OBL	Elatine triandra	WATER-WORT,THREE-STAMEN	OBL	OBL
Cyperus aristatus	FLATSEDGE,AWNED	FACW+,OBL	OBL	Eleocharis acicularis	SPIKERUSH,LEAST	OBL	OBL
Cyperus diandrus	FLATSEDGE,UMBRELLA	FACW,FACW+	FACW	Eleocharis atropurpurea	SPIKERUSH,PURPLE	FACW,FACW+	NI
Cyperus engelmannii	FLATSEDGE,ENGELMANN	FACW+,OBL	OBL	Eleocharis compressa	SPIKERUSH,FLAT-STEM	FACW,FACW+	FACW
Cyperus erythrorhizos	FLATSEDGE,RED-ROOT	FACW+,OBL	OBL	Eleocharis engelmannii	SPIKERUSH,ENGELMANN'S	FACW,OBL	FACW
Cyperus esculentus	CHUFA	FAC,FACW	FACW	Eleocharis erythropoda	SPIKERUSH,BALD	OBL	OBL
Cyperus ferruginescens	FLATSEDGE,RUSTY	FAC,OBL	OBL	Eleocharis macrostachya	SPIKERUSH,CREEPING	OBL	OBL
Cyperus filiculmis	FLATSEDGE,SLENDER	UPL,FAC	FAC	Eleocharis obtusa	SPIKERUSH,BLUNT	OBL	OBL
Cyperus fuscus	FLATSEDGE,BROWN	FAC,FACW	FACW	Eleocharis ovata	SPIKERUSH,OVATE	OBL	OBL
Cyperus odoratus	FLATSEDGE,RUSTY	FACW,FACW+	FACW+	Eleocharis palustris	SPIKERUSH,CREEPING	OBL	OBL
Cyperus rivularis	FLATSEDGE,SHINING	FACW,OBL	FACW	Eleocharis parvula	SPIKERUSH,SMALL	OBL	OBL
Cyperus schweinitzii	FLATSEDGE,SCHWEINITZ'S	UPL,FAC	FACU	Eleocharis pauciflora	SPIKERUSH,FEW-FLOWER	OBL	OBL
Cyperus strigosus	FLATSEDGE,STRAW-COLOR	FACW	FACW	Eleocharis quadrangulata	SPIKERUSH,SQUARE-STEM	OBL	NI
Cypripedium calceolus	LADY'S-SLIPPER,SMALL YELLOW	FACU,FACW	FACW	Eleocharis rostellata	SPIKERUSH,BEAKED	OBL	OBL
Cypripedium candidum	LADY'S-SLIPPER,SMALL WHITE	OBL	OBL	Eleocharis smallii	SPIKERUSH,SMALL'S	OBL	OBL
Cypripedium reginae	LADY'S-SLIPPER,SHOWY	FACW-,FACW+	FACW	Eleocharis wolfii	SPIKERUSH,WOLF'S	OBL	OBL
Cypripedium x andrewsii	LADY'S-SLIPPER,ANDREW'S	FACW	FACW	Eleusine indica	GOOSEGRASS,INDIA	UPL,FACU	FACU
Cystopteris bulbifera	FERN,BULBLET	FAC,FACW	FACW	Ellisia nyctelea	BABY-BLUE-EYES,FALSE	UPL,FAC+	UPL
Cystopteris fragilis	FERN,BRITTLE	FACU,FACU+	FACU	Elodea bifoliata	WATER-WEED,TWO-LEAF	OBL	NI
Dactylis glomerata	GRASS,ORCHARD	FACU,FACU+	FACU	Elodea canadensis	WATER-WEED,BROAD	OBL	OBL
Dalea leporina	PRAIRIE-CLOVER,FOX-TAIL	NI	NI	Elodea longivaginata	WATER-WEED,LONG-SHEATH	OBL	OBL

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Elodea nuttallii	WATER-WEED,NUTTALL'S	OBL	OBL	Euonymus atropurpureus	BURNING-BUSH,EASTERN	FACU,FAC+	FACU
Elymus canadensis	WILD-RYE,NODDING	FACU,FAC+	FACU	Eupatoriadelphus maculatus	JOE-PYE-WEED,SPOTTED	FACW-,OBL	FACW+
Elymus cinereus	WILD-RYE,BASIN	FAC-?	NI	Eupatorium perfoliatum	BONESET,COMMON	FACW+,OBL	OBL
Elymus glaucus	WILD-RYE,BLUE	FACU	FACU	Euphorbia heterophylla	SPURGE,PAINTED	UPL,FAC	NI
Elymus innovatus	WILD-RYE,NORTHWESTERN	FACW?	NI	Euphorbia maculata	BROOMSPURGE,SPOTTED	UPL,FACU	FACU-
Elymus junceus	WILD-RYE,RUSSIAN	FACU,FAC	FACU	Euphorbia marginata	SNOW-ON-THE-MOUNTAIN	UPL,FACU	FACU
Elymus villosus	WILD-RYE,HAIRY	FACU-,FACU	FACU	Euphorbia nutans	BROOMSPURGE,EYEBANE	FACU-,FACU	FACU-
Elymus virginicus	WILD-RYE,VIRGINIA	FAC,FACW	FAC	Eustoma grandiflorum	PRAIRIE-GENTIAN,SHOWY	FAC-,FACW	FACW
Enemion biternatum	RUE-ANEMONE,FALSE	UPL,FACW	UPL	Euthamia camporum	FRAGRANT-GOLDEN-ROD,VISCID	FACU,FACW	FACW
Epilobium anagallidifolium	WILLOW-HERB,PIMPERNEL	FACU-,FACW	NI	Euthamia graminifolia	FRAGRANT-GOLDEN-ROD,FLAT-TOP	FAC,FACW	FACW
Epilobium angustifolium	FIREWEED	FACU,FAC	FAC	Euthamia occidentalis	FRAGRANT-GOLDEN-ROD,WESTERN	FACW,OBL	OBL
Epilobium brachycarpum	WILLOW-HERB,PANICLED	UPL	NI	Festuca altaica	FESCUE,ROUGH	UPL,FAC	UPL
Epilobium ciliatum	WILLOW-HERB,HAIRY	FACU,OBL	FACW	Festuca arundinacea	FESCUE,KENTUCKY	UPL,FACW-	NI
Epilobium coloratum	WILLOW-HERB,PURPLE-LEAF	OBL	OBL	Festuca obtusa	FESCUE,NODDING	FACU,FAC	FACU
Epilobium halleanum	WILLOW-HERB,GLANDULAR	FAC+,FACW+	FACW+	Festuca pratensis	FESCUE,MEADOW	FACU-,FAC	FAC
Epilobium hornemannii	WILLOW-HERB,HORNEMANN'S	FACW-,FACW+	FACW	Festuca subulata	FESCUE,BEARDED	UPL,FAC	UPL
Epilobium leptophyllum	WILLOW-HERB,LINEAR-LEAF	FACW,OBL	OBL	Filaginella uliginosa	CUDWEED,LOW	UPL,FACW	FAC
Epilobium palustre	WILLOW-HERB,MARSH	OBL	OBL	Fimbristylis autumnalis	FIMBRY,SLENDER	FACW+,OBL	OBL
Epilobium saximontanum	WILLOW-HERB,ROCKY MOUNTAIN	FAC,FACW+	FACW+	Floerkea proserpinacoides	MERMAID-WEED,FALSE	FAC,OBL	NI
Epipactis gigantea	HELLOBORINE,GIANT	FACW+,OBL	OBL	Fragaria virginiana	STRAWBERRY,VIRGINIA	UPL,FAC	FACU
Equisetum arvense	HORSETAIL,FIELD	FACU,FACW-	FAC	Fraxinus nigra	ASH,BLACK	FACW,FACW+	FACW
Equisetum fluviatile	HORSETAIL,WATER	OBL	OBL	Fraxinus pennsylvanica	ASH,GREEN	FAC,FACW	FAC
Equisetum hyemale	HORSETAIL,ROUGH	FAC+,FACW	FACW	Galium aparine	BEDSTRAW,CATCHWEED	FACU,FAC-	FACU
Equisetum laevigatum	SCOURING-RUSH,SMOOTH	FAC,FACW	FAC	Galium boreale	BEDSTRAW,NORTHERN	FACU,FAC	FACU
Equisetum palustre	HORSETAIL,MARSH	FACW	FACW	Galium labradoricum	BEDSTRAW,NORTHERN BOG	OBL	OBL
Equisetum pratense	HORSETAIL,MEADOW	FACW	FACW	Galium obtusum	BEDSTRAW,BLUNT-LEAF	FACW-,OBL	OBL
Equisetum scirpoides	SCOURING-RUSH,DWARF	FACU,FAC+	FAC	Galium trifidum	BEDSTRAW,SMALL	FACW,OBL	OBL
Equisetum sylvaticum	HORSETAIL,WOODLAND	FACU,FACW	FACW	Galium triflorum	BEDSTRAW,SWEET-SCENT	FACU,FACU+	FACU
Equisetum variegatum	HORSETAIL,VARIEGATED	FACW,FACW+	FACW	Gaura neomexicana	BUTTERFLY-WEED,NEW MEXICO	FACW,OBL	NI
Equisetum x ferrissii	SCOURING-RUSH,INTERMEDIATE	FAC,FACW	FACW	Gaura parviflora	BUTTERFLY-WEED,VELVET-LEAF	FACU?	NI
Eragrostis cilianensis	STINKGRASS	FACU,FACU+	FACU	Gentiana affinis	GENTIAN,PRAIRIE	FACU	FACU
Eragrostis hypnoides	LOVEGRASS,TEAL	FAC,OBL	OBL	Gentiana andrewsii	GENTIAN,FRINGE-TOP BOTTLE	FAC,FACW+	FAC
Eragrostis pectinacea	LOVEGRASS,PURPLE	FACU,FAC	FAC	Gentianella amarella	GENTIAN,NORTHERN	FAC,OBL	FACW
Eragrostis pilosa	LOVEGRASS,INDIA	FACU	FACU	Gentianopsis crinita	GENTIAN,FRINGED	FACW+,OBL	OBL
Eragrostis reptans	LOVEGRASS,HAIRY CREEPING	FACW+,OBL	OBL	Gentianopsis procera	GENTIAN,LESSER FRINGED	OBL	OBL
Eragrostis spectabilis	LOVEGRASS,PURPLE	UPL,FACU	UPL	Gentianopsis virgata	GENTIAN,LESSER FRINGED	FACW+,OBL	OBL
Erechtites hieraciifolia	BURN,AMERICAN	FACU,FAC	NA	Geranium maculatum	CRANE'S-BILL,PURPLE	FACU	FACU
Erigeron acris	FLEABANE,BITTER	FACU,FAC	FAC	Geranium richardsonii	CRANE'S-BILL,RICHARDSON'S	FACU,FACW	FAC
Erigeron annuus	FLEABANE,WHITE-TOP	FACU,FAC	FACU	Geranium viscosissimum	CRANE'S-BILL,STICKY	FACU,FAC	FACU
Erigeron flagellaris	FLEABANE,TRAILING	FACU,FAC	FAC	Geum aleppicum	AVENS,YELLOW	FACU,FACW+	FACU
Erigeron formosissimus	FLEABANE,BEAUTIFUL	UPL,FAC	FAC	Geum canadense	AVENS,WHITE	FACU,FAC	FACU
Erigeron lonchophyllus	FLEABANE,LOW MEADOW	FAC,FACW	FACW	Geum macrophyllum	AVENS,LARGE-LEAF	FACW,OBL	FACW
Erigeron oxydontus	FLEABANE	FACW	FACW	Geum rivale	AVENS,PURPLE	FAC,OBL	FACW
Erigeron philadelphicus	FLEABANE,PHILADELPHIA	FACU,OBL	FACW	Geum triflorum	WHISKERS,OLD-MAN'S	UPL,FAC	FACU
Erigeron strigosus	FLEABANE,PRAIRIE	FACU,FAC	FACU	Geum vernum	AVENS,SPRING	FACU-,FAC	NI
Eriophorum angustifolium	COTTON-GRASS,NARROW-LEAF	OBL	OBL	Glaux maritima	SEA-MILKWORT	FACW+,OBL	OBL
Eriophorum chamissonis	COTTON-GRASS,RUSSET	OBL	OBL	Glecoma hederacea	IVY,GROUND	UPL,FACU+	FACU
Eriophorum gracile	COTTON-GRASS,SLENDER	OBL	OBL	Gleditsia triacanthos	HONEY-LOCUST	FACU,FAC	FACU
Eriophorum polystachion	COTTON-GRASS,COLDSWAMP	OBL	OBL	Glyceria borealis	GRASS,SMALL FLOATING MANNA	OBL	OBL
Eriophorum viridicarinatum	COTTON-GRASS,GREEN-KEEL	OBL	OBL	Glyceria fluitans	GRASS,WATER MANNA	OBL	OBL
Erysimum cheiranthoides	WALLFLOWER,WORM-SEED	UPL,FAC	FACU	Glyceria maxima	MEADOWGRASS,REED	OBL	OBL

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Glyceria striata	GRASS,FOWL MANNA	OBL	OBL	Juncus brevicaudatus	RUSH,NARROW-PANICLE	OBL	OBL
Glycyrrhiza lepidota	LICORICE,AMERICAN	UPL,FAC+	FACU	Juncus bufonius	RUSH,TOAD	FACW,OBL	OBL
Gnaphalium chilense	CUDWEED,COTTON-BATTING	FAC-,FAC+	NI	Juncus effusus	RUSH,SOFT	FACW+,OBL	OBL
Gnaphalium palustre	CUDWEED,WESTERN MARSH	FAC+,OBL	OBL	Juncus ensifolius	RUSH,THREE-STAMEN	FACW,FACW+	FACW
Goodyera oblongifolia	RATTLESNAKE-PLANTAIN,GIANT	UPL,FACU	FACU	Juncus gerardii	RUSH,SALTMEADOW	FAC,OBL	FAC
Goodyera repens	RATTLESNAKE-PLANTAIN,DWARF	UPL,FACW	FAC-	Juncus interior	RUSH,INLAND	FACU,FACW	FACW
Gratiola aurea	HEDGEHYSSOP,GOLDEN	OBL	OBL	Juncus longistylis	RUSH,LONG-STYLE	FACW,FACW+	FACW
Gratiola neglecta	HEDGEHYSSOP,CLAMMY	OBL	OBL	Juncus nodosus	RUSH,KNOTTED	OBL	OBL
Grindelia squarrosa	GUMWEED,CURLY-CUP	UPL,FACU	UPL	Juncus saximontanus	RUSH,ROCKY MOUNTAIN	FACW,OBL	FACW
Gymnocarpium dryopteris	FERN,OAK	UPL,FAC	FACU	Juncus tenuis	RUSH,SLENDER	FAC-,FACW	FAC
Hackelia floribunda	STICKSEED,DAVIS MOUNTAIN	FACU-,FAC	FACU	Juncus torreyi	RUSH,TORREY'S	FACW,FACW+	FACW
Hackelia virginiana	STICKSEED,VIRGINIA	FACU,FAC+	FACU	Juncus vaseyi	RUSH,VASEY'S	FACW,OBL	FACW
Halenia deflexa	SPURRED-GENTIAN,AMERICAN	FAC	NI	Juniperus horizontalis	JUNIPER,CREEPING	UPL,FAC-	FACU
Haplopappus lanceolatus	GOLDEN-WEED,LANCE-LEAF	FACU,FAC	FACU	Juniperus virginiana	CEDAR,EASTERN RED	FACU-,FACU	FACU-
Hedysarum alpinum	SWEETVETCH,ALPINE	FACU,FAC-	FACU	Kochia scoparia	SUMMER-CYPRESS,MEXICAN	UPL,FAC	FAC
Helenium autumnale	SNEEZEWEED,COMMON	FACW-,OBL	FACW	Lactuca biennis	LETTUCE,BIENNIAL	FACU,FAC+	FAC
Helianthella quinquenervis	ROCKROSE,NODDING	UPL,FACW	FACW	Lactuca canadensis	LETTUCE,TALL YELLOW	FACU-,FAC+	FACU
Helianthus annuus	SUNFLOWER,COMMON	FACU,FAC	FACU	Lactuca floridana	LETTUCE,WOODLAND	FACU-,FAC+	FAC
Helianthus grosseserratus	SUNFLOWER,SAW-TOOTH	FAC,FACW	FACW	Lactuca ludoviciana	LETTUCE,BIENNIAL	UPL,FAC	FAC-
Helianthus maximiliani	SUNFLOWER,MAXIMILIAN'S	UPL,FACU	FACU	Lactuca pulchella	LETTUCE,CHICORY	FACU,FAC	FACU
Helianthus nuttallii	SUNFLOWER,NUTTALL'S	FAC,FACW	FACW	Lactuca serriola	LETTUCE,PRICKLY	FACU,FAC	FACU
Helianthus tuberosus	JERUSALEM-ARTICHOKE	FACU,FAC	FACU	Laportea canadensis	WOOD-NETTLE,CANADA	FAC,FACW	FAC
Heliotropium curassavicum	HELIOTROPE,SEASIDE	FACW,OBL	OBL	Lathyrus palustris	PEAVINE,VETCHLING	FAC,OBL	FAC
Hemicarpha drummondii	DWARF-BULLRUSH,DRUMMOND'S	FACW,OBL	OBL	Lathyrus venosus	PEAVINE,SMOOTH VEINY	FAC,FACW	FACW
Hemicarpha micrantha	DWARF-BULLRUSH	FACW,OBL	OBL	Ledum groenlandicum	LABRADOR-TEA,GREENLAND	FACW,OBL	NI
Heracleum lanatum	COW-PARSNIP	FACU-,OBL	FAC	Leersia oryzoides	CUTGRASS,RICE	OBL	OBL
Heracleum sphondylium	COW-PARSNIP,AMERICAN	UPL,FAC	FAC	Leersia virginica	WHITEGRASS	FACW	FACW
Heteranthera limosa	MUD-PLANTAIN,BLUE	OBL	OBL	Lemna gibba	DUCKWEED,INFLATED	OBL	OBL
Heterotheca subaxillaris	CAMPHOR-WEED	UPL,FACU	NI	Lemna minor	DUCKWEED,LESSER	OBL	OBL
Heuchera richardsonii	ALUM-ROOT,RICHARDSON'S	FACU,FAC	FACU	Lemna perpusilla	DUCKWEED,MINUTE	OBL	OBL
Hierochloe odorata	GRASS,HOLY	FACU,FACW+	FACW	Lemna trisulca	DUCKWEED,STAR	OBL	OBL
Hippuris vulgaris	MARE'S-TAIL,COMMON	OBL	OBL	Lemna valdiviana	DUCKWEED,PALE	OBL	OBL
Hordeum jubatum	BARLEY,FOX-TAIL	FAC,FACW	FACW	Lepidium densiflorum	PEPPER-GRASS,DENSE-FLOWER	FACU,FAC	FACU
Hordeum pusillum	BARLEY,LITTLE	FACU,FAC	FACU	Lepidium latifolium	PEPPER-GRASS,BROAD-LEAF	FACU,FACW	FACW
Humulus lupulus	HOP,COMMON	FACU	NI	Lepidium perfoliatum	PEPPER-GRASS,CLASPING	UPL,FAC	FACU
Hydrophyllum virginianum	WATER-LEAF,VIRGINIA	FAC,FACW	FAC	Lepidium virginicum	PEPPER-GRASS,POOR-MAN'S	UPL,FAC-	FACU
Hypericum majus	ST. JOHN'S-WORT,LARGE CANADIAN	FAC,FACW	FACW	Leptochloa fascicularis	SPRANGLE-TOP,BEARDED	FACW,OBL	OBL
Hypoxis hirsuta	STARGRASS,EASTERN YELLOW	FAC,FACW	FACW	Leptochloa filiformis	SPRANGLE-TOP,RED	FAC,OBL	FACW
Impatiens capensis	TOUCH-ME-NOT,SPOTTED	FACW,FACW+	FACW	Lespedeza capitata	BUSHCLOVER,ROUND-HEAD	UPL,FACU	FACU-
Impatiens pallida	TOUCH-ME-NOT,PALE	FACW	FACW	Liatris lancifolia	GAYFEATHER,LANCE-LEAF	FAC+,FACW	FAC+
Ipomoea purpurea	MORNING-GLORY,COMMON	UPL,FAC	FAC	Liatris ligulistylus	GAYFEATHER,STRAP-STYLE	FAC-,FAC	FAC
Iris missouriensis	IRIS,ROCKY MOUNTAIN	FACW-,OBL	FACW+	Liatris pycnostachya	GAYFEATHER,CATTAIL	FACU,FAC+	FAC
Iris pseudacorus	IRIS,YELLOW	OBL	NI	Lilium canadense	LILY,CANADA	FAC,FACW	FACW
Isoetes melanopoda	QUILLWORT,BLACKFOOT	OBL	OBL	Lilium philadelphicum	LILY,WOOD	FACU-,FACW+	FAC
Iva annua	SUMPWEED,ANNUAL	FAC	FAC	Limosella aquatica	MUDWORT,NORTHERN	OBL	OBL
Iva axillaris	SUMPWEED,SMALL-FLOWER	FACU,FACW	FACU	Lindernia anagallidea	FALSE-PIMPERNEL	FACW+,OBL	OBL
Iva xanthifolia	SUMPWEED,COARSE	FACU,FAC+	FACU	Lindernia dubia	FALSE-PIMPERNEL,YELLOW-SEED	OBL	OBL
Juglans nigra	WALNUT,BLACK	FACU	FACU	Linnaea borealis	TWINFLOWER	UPL,FAC	FACU
Juncus acuminatus	RUSH,TAPER-TIP	OBL	NI	Liparis loeselii	ORCHID,FEN	FACW-,OBL	OBL
Juncus alpinus	RUSH,RICHARDSON'S	OBL	OBL	Listera convallarioides	TWAYBLADE,BROAD-LEAF	FACU,FACW	FACW
Juncus articulatus	RUSH,JOINTED	OBL	OBL	Lobelia kalmii	LOBELIA,BROOK	OBL	OBL
Juncus balticus	RUSH,BALTIC	FACW,OBL	OBL	Lobelia siphilitica	LOBELIA,GREAT BLUE	FACW+,OBL	OBL
Juncus brachycephalus	RUSH,SMALL-HEAD	OBL	OBL	Lobelia spicata	LOBELIA,PALE-SPIKE	FAC-,FAC	FAC

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Lolium perenne	RYEGRASS,PERENNIAL	FACU-,FAC	FACU	Muhlenbergia frondosa	MUHLY,WIRE-STEM	FAC,FACW	FACW
Lonicera dioica	HONEYSUCKLE,MOUNTAIN	FACU	FACU	Muhlenbergia glomerata	MUHLY,MARSH	FACW,FACW+	FACW+
Lonicera tatarica	HONEYSUCKLE,TARTARIAN	FACU	NI	Muhlenbergia mexicana	MUHLY,MEXICAN	FAC,FACW	FACW
Lotus corniculatus	TREFOIL,BIRDS-FOOT	FACU-,FAC	FACU	Muhlenbergia minutissima	MUHLY,LEAST	FACU-,FAC	FAC-
Luzula multiflora	WOODRUSH,COMMON	FACU-,FAC	FAC	Muhlenbergia racemosa	MUHLY,GREEN	FACU,FACW	FACW
Luzula parviflora	WOODRUSH,SMALL-FLOWER	FACU,FAC	NI	Muhlenbergia richardsonis	MUHLY,MAT	FACU,FACW	FAC
Lycopodium complanatum	CLUBMOSS,TRAILING	UPL,FAC	NI	Muhlenbergia sylvatica	MUHLY,FOREST	FAC+,FACW	FACW
Lycopodium dendroideum	CLUBMOSS,TREE-LIKE	FACU,FAC	NI	Myosotis scorpioides	FORGET-ME-NOT,TRUE	FAC,OBL	OBL
Lycopodium obscurum	CLUBMOSS,TREE	FACU-,FACU	FACU	Myosotis sylvatica	FORGET-ME-NOT,WOODLAND	UPL,FACW	FACW
Lycopus americanus	BUGLEWEED,AMERICAN	OBL	OBL	Myosotis verna	FORGET-ME-NOT,SPRING	FAC-,FAC	FAC
Lycopus asper	BUGLEWEED,ROUGH	OBL	OBL	Myosurus aristatus	MOUSE-TAIL,SEDGE	OBL	NI
Lycopus uniflorus	BUGLEWEED,NORTHERN	OBL	OBL	Myosurus minimus	MOUSE-TAIL,TINY	FACW-,OBL	OBL
Lysimachia ciliata	LOOSESTRIFE,FRINGED	FACW-,FACW+	FACW	Myriophyllum heterophyllum	WATER-MILFOIL,TWO-LEAF	OBL	OBL
Lysimachia hybrida	LOOSESTRIFE,LOWLAND	OBL	OBL	Myriophyllum pinnatum	WATER-MILFOIL,CUT-LEAF	OBL	OBL
Lysimachia lanceolata	LOOSESTRIFE,LANCE-LEAF	FAC,FACW-	FACW-	Myriophyllum spicatum	WATER-MILFOIL,EURASIAN	OBL	OBL
Lysimachia quadriflora	LOOSESTRIFE,FOUR-FLOWER	FACW,OBL	FACW	Myriophyllum verticillatum	WATER-MILFOIL,WHORLED	OBL	OBL
Lysimachia thyrsiflora	LOOSESTRIFE,TUFTED	OBL	OBL	Najas flexilis	NAIAD,SLENDER	OBL	OBL
Lysimachia verticillata	LOOSESTRIFE	OBL	OBL	Najas guadalupensis	NAIAD,SOUTHERN	OBL	OBL
Lythrum alatum	LOOSESTRIFE,WINGED	FACW+,OBL	OBL	Najas marina	NAIAD,SPINY	OBL	OBL
Lythrum salicaria	LOOSESTRIFE,PURPLE	FACW+,OBL	OBL	Nasturtium officinale	WATER-CRESS,TRUE	OBL	OBL
Maclura pomifera	OSAGE-ORANGE	UPL,FACU	UPL	Navarretia propinqua	NAVARRETIA,GREAT BASIN	FAC	FAC
Madia glomerata	TARWEED,MOUNTAIN	UPL,FACU	FACU	Nepeta cataria	CATNIP	FACU-,FACW-	FACU
Maianthemum canadense	WILD-LILY-OF-THE-VALLEY	FACU,FAC	FACU	Nuphar luteum	COW-LILY,YELLOW	OBL	OBL
Marrubium vulgare	HOREHOUND,COMMON	UPL,FACW-	FAC	Nymphaea odorata	WATER-LILY,WHITE	OBL	NI
Marsilea vestita	FERN,HAIRY WATER	OBL	OBL	Nymphaea tuberosa	WATER-LILY,WHITE	OBL	NI
Matricaria maritima	MAYWEED,FALSE	UPL,FAC	FAC	Oenothera biennis	EVENING-PRIMROSE,COMMON	FACU-,FACU+	FACU
Matricaria matricarioides	PINEAPPLE-WEED	UPL,FACU	FACU	Oenothera canescens	EVENING-PRIMROSE,SPOTTED	FAC,FACW-	FAC
Matricaria perforata	MAYWEED,SCENTLESS	UPL,FAC	FAC	Oenothera elata	EVENING-PRIMROSE,HOOKER'S	FACU-,FACW	NI
Matteuccia struthiopteris	FERN,OSTRICH	FACW	FACW	Oenothera flava	EVENING-PRIMROSE,YELLOW	FAC+,FACW	FACW
Medicago lupulina	MEDIC,BLACK	UPL,FAC	FACU	Oenothera laciniata	EVENING-PRIMROSE,CUT-LEAF	FACU-,FAC	FACU
Melilotus alba	SWEETCLOVER,WHITE	FACU-,FACU+	FACU-	Oenothera perennis	EVENING-PRIMROSE,SMALL	FAC-,FAC	NI
Melilotus officinalis	SWEETCLOVER,YELLOW	FACU-,FACU+	FACU-	Oenothera rhombipetala	EVENING-PRIMROSE,FOUR-POINT	FACU-,FACU	FACU
Menispermum canadense	MOONSEED,CANADA	FAC	NI	Oenothera villosa	EVENING-PRIMROSE,HAIRY	FACU,FACW	FACU
Mentha arvensis	MINT,FIELD	FAC,FACW	FACW	Onoclea sensibilis	FERN,SENSITIVE	FACW	FACW
Mentha spicata	SPEARMINT	FACW,OBL	NI	Ophioglossum vulgatum	ADDER'S-TONGUE,NORTHERN	FAC,FACW	FACW
Menyanthes trifoliata	BUCKBEAN	OBL	OBL	Ornithogalum umbellatum	STAR-OF-BETHLEHEM,COMMON	FACU,FAC-	FACU
Mertensia ciliata	BLUEBELLS,STREAMSIDE	FACW,OBL	FACW	Orobanche uniflora	BROOMRAPE,ONE-FLOWER	UPL,FACU	UPL
Microsteris gracilis	PHLOX,FALSE	UPL,FAC-	UPL	Orthocarpus luteus	OWL'S-CLOVER,YELLOW	FACU-,FACU	FACU
Mimulus floribundus	MONKEY-FLOWER,FLORIFEROUS	FACW+,OBL	OBL	Oryzopsis hymenoides	RICEGRASS,INDIAN	UPL,FACU+	FACU
Mimulus glabratus	MONKEY-FLOWER,ROUND-LEAF	OBL	OBL	Osmorhiza claytonii	SWEETCICELY,HAIRY	FACU-,FAC-	FACU
Mimulus guttatus	MONKEY-FLOWER,COMMON LARGE	OBL	OBL	Osmorhiza longistylis	SWEETCICELY,SMOOTHER	FACU-,FACW	FACU
Mimulus ringens	MONKEY-FLOWER,ALLEGHANY	OBL	OBL	Ostrya virginiana	HOP-HORNBEAM,EASTERN	FACU-,FACU+	FACU
Minuartia rubella	STITCHWORT,BOREAL	UPL,FAC	FAC	Oxalis corniculata	WOODSORREL,CREEPING	UPL,FACU	FACU
Mirabilis nyctaginea	FOUR-O'CLOCK,HEART-LEAF	UPL,FACU	UPL	Oxalis europaea	WOODSORREL,UPRIGHT YELLOW	UPL,FACU	FACU
Mitella nuda	BISHOP'S-CAP,NAKED	FAC,OBL	OBL	Oxytropis deflexa	CRAZY-WEED,HANGPOD	FACU,FACW	FACU
Moehringia lateriflora	SANDWORT,GROVE	UPL,FAC	FACU	Oxytropis lambertii	CRAZY-WEED,LAMBERT'S	UPL,FACU	UPL
Mollugo verticillata	CARPET-WEED,GREEN	FAC-,FAC	FAC	Oxytropis splendens	CRAZY-WEED,SHOWY	UPL,FAC	FACU
Monarda fistulosa	BERGAMOT,WILD	UPL,FAC+	UPL	Panicum capillare	WITCHGRASS	FACU,FAC	FAC
Monolepis nuttalliana	POVERTY-WEED,NUTTALL'S	UPL,FACW	FAC	Panicum dichotomiflorum	GRASS,FALL PANIC	FAC,FACW	FAC
Monotropa uniflora	INDIAN-PIPE	UPL,FACU	FACU	Panicum flexile	WITCHGRASS,WIRY	FACU,FACW+	NI
Morus alba	MULBERRY,WHITE	UPL,FAC	FACU	Panicum virgatum	SWITCHGRASS	FAC,FACW	FAC
Muhlenbergia asperifolia	MUHLY,ALKALI	FACW,FACW+	FACW	Parietaria pensylvanica	PELLITORY,PENNSYLVANIA	FACU-,FACW-	FACU
Muhlenbergia filiformis	MUHLY,PULLUP	FACW,OBL	FACW	Parnassia glauca	GRASS-OF-PARNASSUS,WAXY	OBL	OBL

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Parnassia palustris	GRASS-OF-PARNASSUS,NORTHERN	FACW,OBL	OBL	Platanthera hyperborea	ORCHID,NORTHERN GREEN	FACW,FACW+	FACW+
Parnassia parviflora	GRASS-OF-PARNASSUS,SMALL-FLOWER	OBL	OBL	Platanthera leucophaea	ORCHID,PRAIRIE WHITE-FRINGE	FACW,OBL	FACW
Parthenocissus quinquefolia	CREEPER,VIRGINIA	FACU,FAC	FAC	Platanthera orbiculata	ORCHID,LARGE ROUND-LEAF	FACU,FACW	FAC
Parthenocissus vitacea	CREEPER,THICKET	FACU,FACW-	FACU	Platanthera stricta	BOGORCHID,SLENDER	FACW	FACW
Pedicularis canadensis	LOUSEWORT,EARLY WOOD	FACU,FAC+	FACU	Platanthera x clavellata	ORCHID,SMALL GREEN WOODLAND	FACW+,OBL	OBL
Pedicularis grayi	LOUSEWORT,GRAY	FACU,FAC	FAC	Poa ampla	BLUEGRASS,BIG	UPL,FAC-	FAC-
Pedicularis lanceolata	LOUSEWORT,SWAMP	FACW,OBL	OBL	Poa annua	BLUEGRASS,ANNUAL	FACU,FACW-	FACU
Penstemon digitalis	BEARDTONGUE,FOXGLOVE	FAC-,FACW-	FAC	Poa arida	BLUEGRASS,PLAINS	UPL,FAC	FAC
Penstemon gracilis	BEARDTONGUE,SLENDER	UPL,FACU	FACU	Poa compressa	BLUEGRASS,CANADA	FACU-,FAC	FACU
Penstemon procerus	BEARDTONGUE,SMALL-FLOWER	FAC	NI	Poa fendlerana	BLUEGRASS,MUTTON	UPL,FACU	FACU-
Penthorum sedoides	DITCH-STONECROP	OBL	OBL	Poa glaucifolia	BLUEGRASS,SWALLEN'S	FAC,FACW	FACW
Perideridia gairdneri	YAMPAH,GAIRDNER'S	FACU,FACW	FACU	Poa juncifolia	BLUEGRASS,ALKALI	FACU,FAC	FAC
Petasites frigidus	COLTSFOOT,ARCTIC SWEET	FAC,FACW	FAC	Poa nemoralis	BLUEGRASS,WOODS	FAC-,FACW	FAC-
Petasites palmatus	COLTSFOOT,SWEET	FAC,FACW+	FACW+	Poa nevadensis	BLUEGRASS,NEVADA	FACU-,FACW	FAC
Petasites sagittatus	COLTSFOOT,ARROW-LEAF SWEET	FAC,OBL	FACW+	Poa palustris	BLUEGRASS,FOWL	FACU,FACW+	FACW
Phalaris arundinacea	GRASS,REED CANARY	FACW,OBL	FACW+	Poa pratensis	BLUEGRASS,KENTUCKY	FACU,FAC-	FACU
Phalaris canariensis	GRASS,COMMON CANARY	UPL,FACU+	FACU	Poa sylvestris	BLUEGRASS,WOODLAND	FACU,FACW	FACU
Phleum alpinum	TIMOTHY,ALPINE	FACU,FACW	FACW	Poa trivialis	BLUEGRASS,ROUGH	FAC,FACW	FACW
Phleum pratense	TIMOTHY	FACU	FACU	Pogonia ophioglossoides	POGONIA,ROSE	OBL	NI
Phlox divaricata	PHLOX,WOODLAND	UPL,FACU	UPL	Polanisia dodecandra	CLAMMY-WEED,ROUGH-SEED	UPL,FACU	FACU
Phlox kelseyi	PHLOX,KELSEY'S	OBL?	NI	Polygala sanguinea	MILKWORT,RED	FACU,FACW	FACW
Phlox pilosa	PHLOX,DOWNY	FACU,FAC	NI	Polygala senega	SNAKEROOT,SENECA	FACU	FACU
Phragmites australis	REED,COMMON	FACW,FACW+	FACW	Polygala verticillata	MILKWORT,WHORLED	UPL,FAC-	UPL
Phryma leptostachya	LOPSEED,AMERICAN	UPL,FAC	FAC	Polygonatum biflorum	SOLOMON'S-SEAL,SMALL	UPL,FAC-	UPL
Phyla cuneifolia	FROG-FRUIT,WEDGE-LEAF	FAC,FACW	FAC	Polygonatum commutatum	SOLOMON'S-SEAL,GREAT	UPL,FAC	UPL
Phyla lanceolata	FROG-FRUIT,LANCE-LEAF	FACW,OBL	OBL	Polygonum achoreum	KNOTWEED,LEATHERY	FACU,FAC	FACU
Physocarpus monogynus	NINEBARK,MOUNTAIN	UPL,FAC	FACU	Polygonum amphibium	SMARTWEED,WATER	OBL	OBL
Physocarpus opulifolius	NINEBARK,EASTERN	UPL,FACW-	FACU	Polygonum aviculare	KNOTWEED,PROSTRATE	UPL,FACW	FACU
Physostegia parviflora	DRAGON-HEAD,PURPLE	FACW-,OBL	FACW	Polygonum convolvulus	BINDWEED,BLACK	FACU-,FAC	FAC
Physostegia virginiana	DRAGON-HEAD,FALSE	FAC+,OBL	OBL	Polygonum douglasii	KNOTWEED,DOUGLAS'	UPL,FAC	FAC
Picea glauca	SPRUCE,WHITE	FACU	FACU	Polygonum erectum	KNOTWEED,ERECT	FACU-,OBL	OBL
Picris echioides	OXTONGUE,BRISTLY	UPL,FAC	UPL	Polygonum hydropiper	SMARTWEED,MARSHPEPPER	FACW,OBL	OBL
Pilea fontana	CLEARWEED,SPRINGS	FACW,OBL	OBL	Polygonum hydropiperoides	SMARTWEED,SWAMP	OBL	OBL
Pilea pumila	CLEARWEED,CANADA	FAC,FACW	FACW	Polygonum lapathifolium	WILLOW-WEED	FAC,OBL	OBL
Pinus contorta	PINE,LODGE-POLE	FACU-,FAC	FACU	Polygonum pensylvanicum	SMARTWEED,PENNSYLVANIA	FACW-,OBL	FACW
Pinus ponderosa	PINE,PONDEROSA	UPL,FACU	UPL	Polygonum persicaria	THUMB,LADY'S	FAC,OBL	FACW
Piperia unalascensis	REINORCHID,ALASKA	UPL,FAC	FAC	Polygonum punctatum	SMARTWEED,DOTTED	FACW,OBL	OBL
Plagiobothrys scouleri	POPCORN-FLOWER,SCOULER	FACW,OBL	FACW+	Polygonum ramosissimum	KNOTWEED,BUSHY	FACU-,FACW	FACU
Plantago elongata	PLANTAIN,SLENDER	FAC,FACW+	FACW	Polygonum sagittatum	TEARTHUMB,ARROW-LEAF	OBL	OBL
Plantago eriopoda	PLANTAIN,SALINE	FACU,FACW	FAC	Polygonum scandens	FALSE-BUCKWHEAT,CLIMBING	FACU,FACW	FACU
Plantago lanceolata	PLANTAIN,ENGLISH	UPL,FAC	FAC	Polygonum viviparum	KNOTWEED,VIVIPAROUS	FAC,FACW	FACW
Plantago major	PLANTAIN,COMMON	FACU,FACW	FAC	Polypogon monspeliensis	GRASS,ANNUAL RABBIT-FOOT	FACW,OBL	OBL
Plantago patagonica	PLANTAIN,WOOLLY	UPL,FACU-	UPL	Polystichum lonchitis	FERN,NORTHERN HOLLY	UPL,FAC	FACU-
Plantago pusilla	PLANTAIN,DWARF	UPL,FAC	NI	Populus angustifolia	COTTON-WOOD,NARROW-LEAF	FAC,FACW	FACW
Plantago rugelii	PLANTAIN,BLACK-SEED	FACU,FAC	FACU	Populus balsamifera	POPLAR,BALSAM	FACU,FACW	FACW
Plantago virginica	PLANTAIN,PALE-SEED	UPL,FACW	FACU-	Populus deltoides	COTTON-WOOD,EASTERN	FAC,FACW	FAC
Platanthera dilatata	ORCHID,LEAFY WHITE	FACW,FACW+	FACW	Populus tremula	ASPEN,QUAKING	FACU,FAC+	FAC
Platanthera hyperborea	ORCHID,NORTHERN GREEN	FACW,FACW+	FACW+	Populus x acuminata	COTTON-WOOD,LANCE-LEAF	FAC,FACW	FAC
Platanthera leucophaea	ORCHID,PRAIRIE WHITE-FRINGE	FACW,OBL	FACW	Portulaca oleracea	PURSLANE,COMMON	FACU,FAC	FACU
Platanthera orbiculata	ORCHID,LARGE ROUND-LEAF	FACU,FACW	FAC	Potamogeton alpinus	PONDWEED,ALPINE	OBL	OBL
Platanthera stricta	BOGORCHID,SLENDER	FACW	FACW	Potamogeton amplifolius	PONDWEED,LARGE-LEAF	OBL	OBL

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Potamogeton crispus	PONDWEED,CURLY	OBL	OBL	Pyrola rotundifolia	WINTERGREEN,ROUND-LEAF	FACU,FAC	FACU
Potamogeton diversifolius	PONDWEED,WATER-THREAD	OBL	OBL	Pyrola secunda	WINTERGREEN,ONE-SIDED	UPL,FAC+	FACU
Potamogeton epihydrus	PONDWEED,RIBBON-LEAF	OBL	OBL	Pyrola uniflora	WINTERGREEN,ONE-FLOWERED	FACU,FAC	FAC
Potamogeton filiformis	PONDWEED,FINE-LEAF	OBL	OBL	Quercus macrocarpa	OAK,BUR	FACU,FAC	FACU
Potamogeton foliosus	PONDWEED,LEAFY	OBL	OBL	Ranunculus abortivus	BUTTER-CUP,SUBALPINE	FAC,FACW	FACW
Potamogeton friesii	PONDWEED,FRIES'S	OBL	OBL	Ranunculus acris	BUTTER-CUP,TALL	FAC+,FACW	FACW
Potamogeton gramineus	PONDWEED,GRASSY	OBL	OBL	Ranunculus aquatilis	BUTTER-CUP,WHITE WATER	OBL	OBL
Potamogeton illinoensis	PONDWEED,ILLINOIS	OBL	OBL	Ranunculus cardiophyllus	BUTTER-CUP,HEART-LEAF	FACW,FACW+	FACW
Potamogeton natans	PONDWEED,FLOATING-LEAF	OBL	OBL	Ranunculus cymbalaria	BUTTER-CUP,SEASIDE	OBL	OBL
Potamogeton nodosus	PONDWEED,LONG-LEAF	OBL	OBL	Ranunculus flabellaris	BUTTER-CUP,YELLOW WATER	OBL	OBL
Potamogeton pectinatus	PONDWEED,SAGO	OBL	OBL	Ranunculus flammula	BUTTER-CUP,SPEARWORT	FACW	NI
Potamogeton praelongus	PONDWEED,WHITE-STEM	OBL	OBL	Ranunculus glaberrimus	BUTTER-CUP,SAGEBRUSH	FACU,FAC	FAC
Potamogeton pusillus	PONDWEED,SMALL	OBL	OBL	Ranunculus gmelinii	BUTTER-CUP,SMALL YELLOW WATER	FACW,OBL	FACW+
Potamogeton richardsonii	PONDWEED,RICHARDSON	OBL	OBL	Ranunculus hispidus	BUTTER-CUP,BRISTLY	FAC,FACW	FAC
Potamogeton spirillus	PONDWEED,SPIRAL	OBL	OBL	Ranunculus inamoenus	BUTTER-CUP,GRACEFUL	FACW-,FACW	FACW
Potamogeton strictifolius	PONDWEED,NARROW-LEAF	OBL	OBL	Ranunculus longirostris	BUTTER-CUP,LONG-BEAK WATER	OBL	OBL
Potamogeton vaginatus	PONDWEED,SHEATHED	OBL	OBL	Ranunculus macounii	BUTTER-CUP,MACOUN'S	FACW,OBL	OBL
Potamogeton zosteriformis	PONDWEED,FLAT-STEM	OBL	OBL	Ranunculus micranthus	BUTTER-CUP,ROCK	FACU,FAC	FAC
Potentilla anserina	SILVERWEED	FACW,OBL	OBL	Ranunculus pensylvanicus	BUTTER-CUP,PENNSYLVANIA	FACW,OBL	FACW+
Potentilla argentea	CINQUEFOIL,SILVER	UPL,FAC-	FACU	Ranunculus recurvatus	BUTTER-CUP,HOOKED	FAC,FACW+	FAC
Potentilla arguta	CINQUEFOIL,TALL	UPL,FACU+	FACU	Ranunculus sceleratus	BUTTER-CUP,CELERY-LEAF	OBL	OBL
Potentilla biennis	CINQUEFOIL,BIENNIAL	FAC,FACW	FACW	Ranunculus septentrionalis	BUTTER-CUP,NORTHERN SWAMP	FACW+,OBL	OBL
Potentilla diversifolia	CINQUEFOIL,VARILEAF	FACU,FACW	FACW	Ranunculus subrigidus	BUTTER-CUP,POND	OBL	OBL
Potentilla fruticosa	CINQUEFOIL,SHRUBBY	FAC-,FACW	FACW	Ranunculus trichophyllus	WATER-CROWFOOT,WHITE	OBL	OBL
Potentilla glandulosa	CINQUEFOIL,GLAND	FACU,OBL	FAC	Rhamnus alnifolia	BUCKTHORN,ALDER-LEAF	FACU,OBL	FACW
Potentilla gracilis	CINQUEFOIL,NORTHWEST	FAC-,FACW	FAC	Rhamnus cathartica	BUCKTHORN,COMMON	UPL,FACU	FACU
Potentilla millegrana	CINQUEFOIL,DIFFUSE	FAC+,OBL	OBL	Rhamnus lanceolata	BUCKTHORN,LANCE-LEAF	NI	NI
Potentilla nicolletii	CINQUEFOIL,NICOLLET'S	FAC,FAC+	NI	Rhus trilobata	SUMAC,SMOOTH	FAC?	NI
Potentilla norvegica	CINQUEFOIL,NORWEGIAN	FACU,FAC	FAC	Rhynchospora alba	BEAKRUSH,WHITE	OBL	NI
Potentilla palustris	CINQUEFOIL,MARSH	OBL	NI	Rhynchospora capillacea	BEAKRUSH,NEEDLE	OBL	OBL
Potentilla paradoxa	CINQUEFOIL,BUSHY	FAC,OBL	FACW	Ribes americanum	CURRANT,WILD BLACK	FAC,FACW	FACW
Potentilla pentandra	CINQUEFOIL,FIVE-STAMEN	FACW,FACW+	NI	Ribes cereum	CURRANT,WHITE SQUAW	FACU?	NI
Potentilla plattensis	CINQUEFOIL,PLATTE	FACW,OBL	FACW+	Ribes hirtellum	GOOSEBERRY,HAIRY-STEM	FAC,FACW	FAC
Potentilla rivalis	CINQUEFOIL,BROOK	FACW,OBL	OBL	Ribes lacustre	CURRANT,PRICKLY	FAC,FACW	FACW
Prenanthes alba	RATTLESNAKE-ROOT,WHITE	FACU	FACU	Ribes odoratum	CURRANT,BUFFALO	FACU,FAC	FACU
Prenanthes aspera	RATTLESNAKE-ROOT,ROUGH	UPL	UPL	Ribes setosum	GOOSEBERRY,BRISTLY	FACW?	NI
Prenanthes racemosa	RATTLESNAKE-ROOT,GLAUCOUS	FACU-,FACW	FACU	Ribes triste	CURRANT,SWAMP RED	FAC,OBL	OBL
Primula incana	PRIMROSE,AMERICAN	FACW,OBL	FACW	Robinia pseudoacacia	LOCUST,BLACK	UPL,FAC	UPL
Proboscidea louisianica	UNICORN-PLANT,LOUISIANA	UPL,FAC+	FACU	Rorippa austriaca	YELLOW-CRESS,AUSTRIAN	FAC-,FACW	FACW
Prunella vulgaris	HEAL-ALL	FACU,FACW	FACW	Rorippa calycina	YELLOW-CRESS,PERSISTENT-SEPAL	FACW,OBL	OBL
Prunus americana	PLUM,AMERICAN	UPL,FACU	UPL	Rorippa curvipes	YELLOW-CRESS,BLUNT-LEAF	FACW,OBL	OBL
Prunus pensylvanica	CHERRY,FIRE	FACU-,FAC-	FACU+	Rorippa palustris	YELLOW-CRESS,BOG	FAC,OBL	OBL
Prunus serotina	CHERRY,BLACK	FACU	FACU	Rorippa sinuata	YELLOW-CRESS,SPREADING	FAC+,FACW	FACW
Prunus virginiana	CHERRY,CHOKE	FACU-,FAC	FACU-	Rorippa sylvestris	YELLOW-CRESS,CREEPING	FACW,OBL	FACW+
Pteridium aquilinum	FERN,BRACKEN	FACU,FAC-	FACU	Rorippa tenerrima	YELLOW-CRESS,MODOC COUNTY	FAC	FAC
Ptilimnium capillaceum	BISHOP-WEED,HAIR-LIKE MOCK	FACW,OBL	NI	Rorippa truncata	YELLOW-CRESS,WILD	FAC,FACW	FAC
Puccinellia airoides	GRASS,NUTTALL ALKALI	FACW,OBL	FACW	Rosa acicularis	ROSE,PRICKLY	FACU	FACU
Puccinellia distans	GRASS,WEEPING ALKALI	FACW,OBL	FACW	Rosa arkansana	ROSE,PRAIRIE	FAC?	NI
Puccinellia nuttalliana	GRASS,NUTTALL'S ALKALI	FAC,OBL	OBL	Rosa blanda	ROSE,SMOOTH	FACU-,FACU	FACU
Puccinellia pauciflora	GRASS,WEAK MANNA	FACW,OBL	OBL	Rosa multiflora	ROSE,MULTIFLORA	UPL,FACU	NI
Pycnanthemum virginianum	MOUNTAIN-MINT,VIRGINIA	FAC,FACW+	FAC	Rosa woodsii	ROSE,WOODS	UPL,FAC-	FACU
Pyrola asarifolia	WINTERGREEN,PINK	FACU,FACW	FACU	Rotala ramosior	TOOTHCUP	OBL	NI
Pyrola chlorantha	WINTERGREEN,GREENISH-FLOWER	UPL,FACW	FACU	Rubus idaeus	RASPBERRY,COMMON RED	UPL,FAC	FACU

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Rubus parviflorus	THIMBLE-BERRY,WESTERN	FACU,FAC+	FACU	Sambucus racemosa	ELDER,EUROPEAN RED	FACU,FACU+	FACU
Rubus pubescens	BLACKBERRY,DWARF	FAC,FACW+	FACW	Sanguinaria canadensis	BLOODROOT	UPL,FACU-	NI
Rubus strigosus	RASPBERRY,RED	FACU,FACW	FACW	Sanicula canadensis	BLACK-SNAKEROOT,CANADIAN	UPL,FACU+	UPL*
Rudbeckia hirta	SUSAN,BLACK-EYED	FACU-,FACU	FACU	Sanicula gregaria	BLACK-SNAKEROOT,CLUSTERED	FACU,FAC+	FAC
Rudbeckia laciniata	CONEFLOWER,CUT-LEAF	FACU,FACW+	FACU	Sanicula marilandica	BLACK-SNAKEROOT	FACU?	NI
Rumex acetosella	SORREL,SHEEP	UPL,FACW	FAC	Saponaria officinalis	BOUNCING-BET	UPL,FACU	FACU
Rumex altissimus	DOCK,PALE	FAC,FACW+	FAC	Sarcobatus vermiculatus	GREASEWOOD,BLACK	FACU,FACU+	FACU
Rumex britannica	DOCK,GREAT WATER	FACW+,OBL	OBL	Saxifraga cernua	SAXIFRAGE,NODDING	UPL,FACW	UPL
Rumex crispus	DOCK,CURLY	FACU,FACW	FACW	Saxifraga occidentalis	SAXIFRAGE,WESTERN	FAC	FAC
Rumex domesticus	DOCK,DOORYARD	FACU,FAC+	FAC+	Scheuchzeria palustris	POD-GRASS	OBL	NI
Rumex fueginus	DOCK,SEA-SIDE	FACW,OBL	FACW	Schizachne purpurascens	MELIC,FALSE	UPL,FAC	FACU
Rumex maritimus	DOCK,GOLDEN	FACW-,OBL	FACW+	Schizachyrium scoparium	BLUESTEM,LITTLE	FACU-,FACU+	FACU
Rumex mexicanus	DOCK,MEXICAN	FAC-,FACW	FACW	Scirpus acutus	BULRUSH,HARD-STEM	OBL	OBL
Rumex obtusifolius	DOCK,BITTER	FACU-,FACW	FAC+	Scirpus americanus	BULRUSH,OLNEY'S	OBL	OBL
Rumex occidentalis	DOCK,WESTERN	FACW+,OBL	OBL	Scirpus atrovirens	BULRUSH,GREEN	OBL	OBL
Rumex orbiculatus	DOCK,GREAT WATER	OBL	OBL	Scirpus cyperinus	WOOL-GRASS	FACW+,OBL	OBL
Rumex stenophyllus	DOCK,NARROW-LEAF	FACW-,FACW+	FACW+	Scirpus fluviatilis	BULRUSH,RIVER	OBL	OBL
Rumex triangulivalvis	DOCK,TRIANGULAR-VALVE	FACU,FACW	FAC+	Scirpus hallii	BULRUSH,HALL'S	OBL	OBL
Rumex venosus	DOCK,VEINY	UPL,FACW	FAC	Scirpus heterochaetus	BULRUSH,SLENDER	OBL	OBL
Ruppia maritima	WIDGEON-GRASS	OBL	OBL	Scirpus maritimus	BULRUSH,SALTMARSH	OBL	NI
Sagina saginoides	PEARLWORT,ARCTIC	FAC,OBL	FACW	Scirpus microcarpus	BULRUSH,SMALL-FRUIT	OBL	OBL
Sagittaria brevirostra	ARROW-HEAD,SHORT-BEAK	OBL	OBL	Scirpus nevadensis	BULRUSH,NEVADA	OBL	OBL
Sagittaria calycina	ARROW-HEAD,HOODED	OBL	OBL	Scirpus pallidus	BULRUSH,CLOAKED	OBL	OBL
Sagittaria cuneata	ARROW-HEAD,NORTHERN	OBL	OBL	Scirpus pendulus	BULRUSH,DROOPING	OBL	OBL
Sagittaria engelmanniana	ARROW-HEAD,ENGELMANN	OBL	OBL	Scirpus pungens	BULRUSH,THREE-SQUARE	FACW+,OBL	OBL
Sagittaria graminea	ARROW-HEAD,GRASS-LEAF	OBL	OBL	Scirpus validus	BULRUSH,SOFT-STEM	OBL	OBL
Sagittaria latifolia	ARROW-HEAD,BROAD-LEAF	OBL	OBL	Scolochloa festucacea	SPRANGLE-TOP	OBL	OBL
Sagittaria montevidensis	ARROW-HEAD,LONG-LOBED	OBL	OBL	Scrophularia lanceolata	FIGWORT,LANCE-LEAF	UPL,FACW	FAC-
Salicornia rubra	SALTWORT,RED	OBL	OBL	Scrophularia marilandica	SQUARE,CARPENTER'S	FACU-	NI
Salix alba	WILLOW,WHITE	FACW-,FACW	FACW	Scutellaria galericulata	SKULLCAP,HOODED	FACW+,OBL	OBL
Salix amygdaloides	WILLOW,PEACH-LEAF	FACW	FACW	Scutellaria lateriflora	SKULLCAP,BLUE	FACW,OBL	FACW
Salix bebbiana	WILLOW,BEBB	FAC,FACW+	FACW	Scutellaria parvula	SKULLCAP,SMALL	UPL,FACU	NI
Salix candida	WILLOW,HOARY	OBL	OBL	Senecio aureus	RAGWORT,GOLDEN	FACW	FACW
Salix cordata	WILLOW,HEART-LEAF	FAC,FACW	NI	Senecio congestus	GROUNDSEL,MARSH	FACW,FACW+	FACW+
Salix discolor	WILLOW,PUSSY	FACW	FACW	Senecio crassulus	GROUNDSEL,THICK-LEAF	FACU,OBL	OBL
Salix eriocephala	WILLOW,MISSOURI RIVER	FACW	FACW	Senecio eremophilus	GROUNDSEL,DESERT	UPL,OBL	FAC
Salix exigua	WILLOW,SANDBAR	FACW,OBL	FACW+	Senecio hydrophilus	GROUNDSEL,WATER	OBL	OBL
Salix fragilis	WILLOW,CRACK	FAC,FAC+	FAC	Senecio integerrimus	GROUNDSEL,LAMBSTONGUE	FAC,FACW-	FAC
Salix humilis	WILLOW,TALL PRAIRIE	FACU	FACU	Senecio pauperculus	GROUNDSEL,BALSAM	FAC,FACW+	FAC
Salix lasiandra	WILLOW,PACIFIC	FACW,OBL	FACW+	Senecio plattensis	GROUNDSEL,PRAIRIE	UPL,FACU	FACU-
Salix lucida	WILLOW,SHINING	FACW,FACW+	FACW	Senecio pseudaureus	GROUNDSEL,GOLDEN	FACU,FACW	FACW
Salix lutea	WILLOW,YELLOW	FACW+,OBL	FACW+	Senecio vulgaris	GROUNDSEL,COMMON	UPL,FAC	FAC
Salix monticola	WILLOW,MOUNTAIN	FAC,OBL	OBL	Setaria faberi	GRASS,JAPANESE BRISTLE	UPL,FACU+	UPL
Salix pedicellaris	WILLOW,BOG	UPL,OBL	NI	Setaria glauca	GRASS,YELLOW BRISTLE	FACU,FAC	FACU
Salix petiolaris	WILLOW,MEADOW	FACW+,OBL	OBL	Setaria italica	GRASS,FOX-TAIL BRISTLE	FACU,FAC	FACU
Salix planifolia	WILLOW,DIAMOND-LEAF	FACW,OBL	OBL	Setaria verticillata	GRASS,BUR BRISTLE	FACU,FAC	FAC
Salix pseudomonticola	WILLOW,PARK	FACW	FACW	Shepherdia canadensis	BUFFALO-BERRY,CANADA	NI	NI
Salix rigida	WILLOW,HEART-LEAF	UPL,OBL	FACW	Sicyos angulatus	BUR-CUCUMBER,ONE-SEED	FACU,FACW-	FAC
Salix scoulerana	WILLOW,SCOULER	FACU,FAC	FACU	Silene menziesii	CAMPION,MENZIES'	UPL,FAC	UPL
Salix serissima	WILLOW,AUTUMN	OBL	OBL	Silene nivea	CAMPION,SNOWY	FAC,FACW	FACW
Salsola kali	THISTLE,RUSSIAN	FACU-,FACU+	FACU-	Silphium perfoliatum	CUP-PLANT	FACU,FACW	FACW
Salsola pestifer	THISTLE,RUSSIAN	FACU-,FACU	FACU-	Sisymbrium altissimum	MUSTARD,TALL TUMBLE	UPL,FAC	UPL
Sambucus canadensis	ELDER,AMERICAN	UPL,FACW	FAC	Sisyrinchium angustifolium	BLUE-EYE-GRASS,POINTED	FACU,FACW-	FACU

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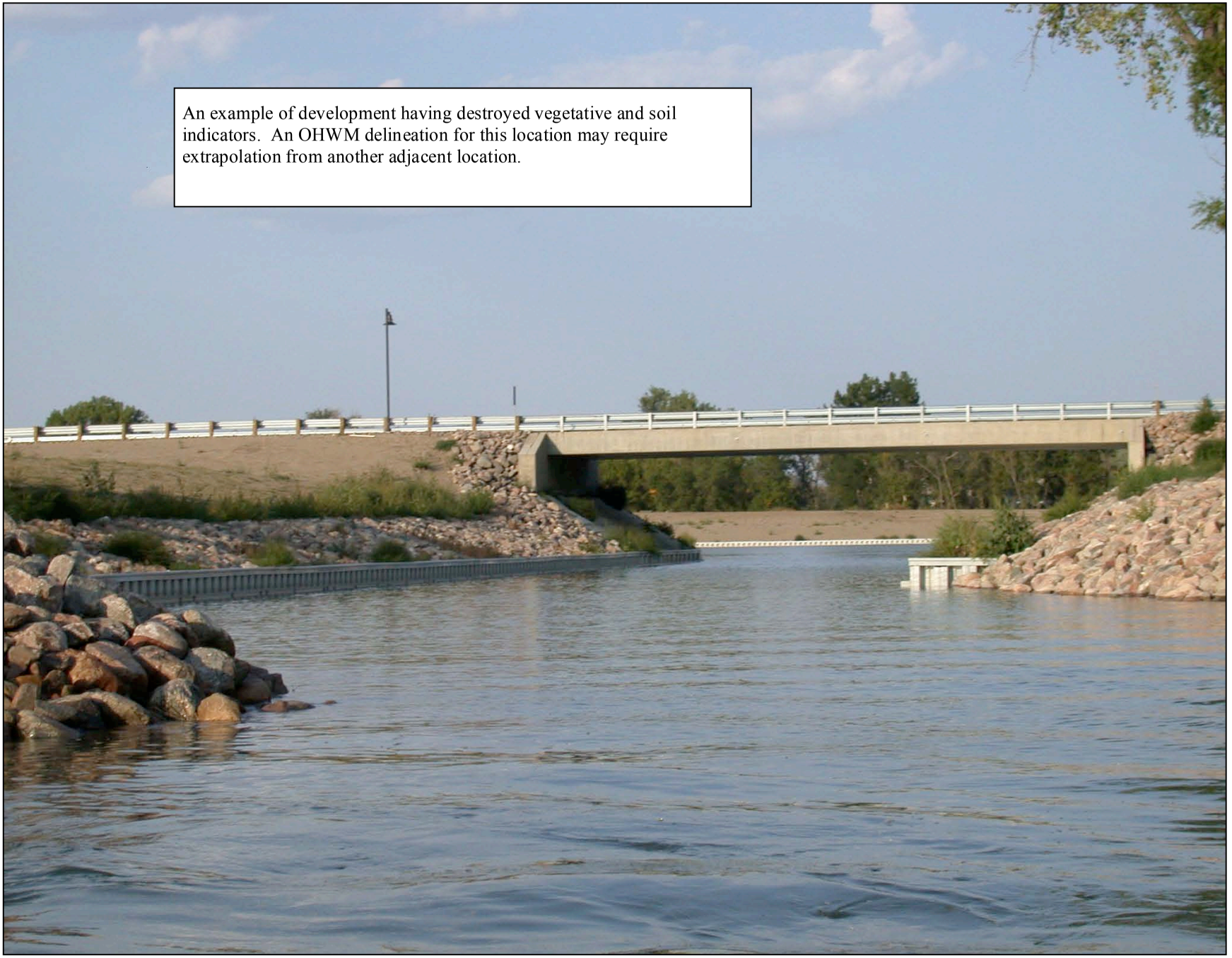
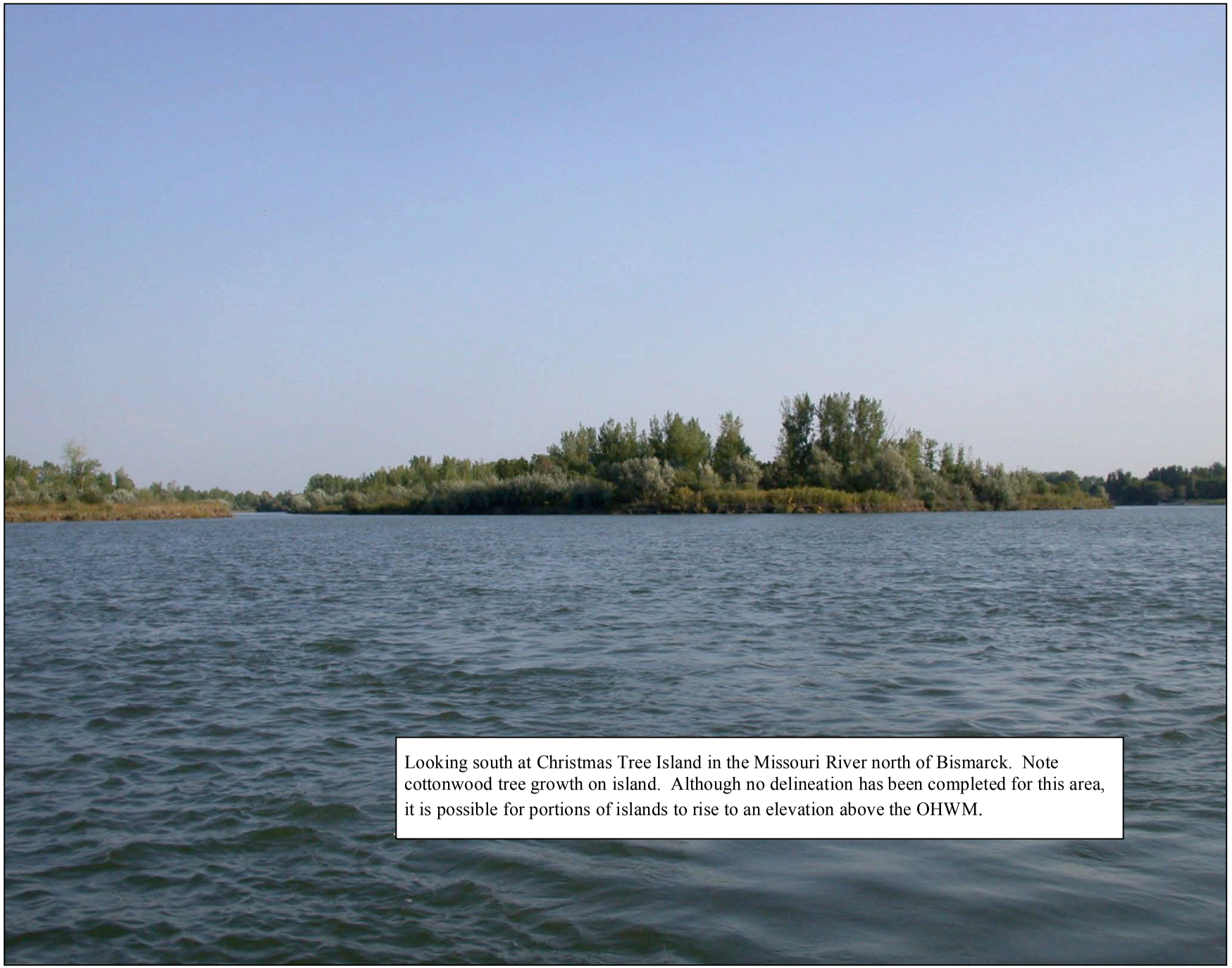
Sisyrinchium montanum	BLUE-EYE-GRASS,STRICT	FACU,FACW	FAC	Stellaria calycantha	STARWORT,NORTHERN	FACW,OBL	NI
Sisyrinchium mucronatum	BLUE-EYE-GRASS,MICHAUX'S	FAC+,FACW-	FAC+	Stellaria crassifolia	STARWORT,FLESHY	FACW,OBL	OBL
Sitanion hystrix	SQUIRREL-TAIL,BOTTLEBRUSH	UPL,FACU	FACU	Stellaria graminea	STARWORT,LESSER	UPL,FAC	FACU
Sium suave	WATER-PARSNIP,HEMLOCK	OBL	OBL	Stellaria longifolia	STARWORT,LONG-LEAF	FAC,OBL	FACW
Smilacina racemosa	FALSE-SOLOMON'S-SEAL,FEATHER	FACU-,FAC	FAC	Stellaria longipes	STARWORT,LONG-STALK	FACU-,OBL	OBL
Smilacina stellata	FALSE-SOLOMON'S-SEAL,STARRY	FACU,FACW	FACU	Stellaria media	CHICKWEED,COMMON	UPL,FACU	UPL
Smilax herbacea	CARRION-FLOWER,SMOOTH	FAC	FAC	Stipa richardsonii	GRASS,RICHARDSON'S NEEDLE	NI	NI
Smilax hispida	GREENBRIER,BRISTLY	FAC,FAC+	FAC	Streptopus amplexifolius	TWISTED-STALK,CLASP-LEAF	UPL,OBL	OBL
Solanum americanum	NIGHTSHADE,BLACK	FACU-,FAC	FAC	Strophostyles helvola	WILDBEAN,TRAILING	FACU-,FAC+	FAC
Solanum carolinense	NIGHTSHADE,CAROLINA	UPL,FACU	UPL	Suaeda depressa	SEEPWEED,PURSH	FACW-,FACW+	FACW
Solanum dulcamara	NIGHTSHADE,CLIMBING	FACU,FAC+	FACU	Suaeda intermedia	SEEPWEED,ALKALI	FACU,FAC	FACU
Solanum nigrum	NIGHTSHADE,BLACK	FACU-,FACU+	FACU	Suckleya suckleyana	SUCKLEYA,POISON	FAC,OBL	OBL
Solidago altissima	GOLDEN-ROD,TALL	FACU-,FACU+	FACU	Sullivantia hapemanii	SULLIVANTIA	NI	NI
Solidago canadensis	GOLDEN-ROD,CANADA	FACU,FACU+	FACU	Swertia radiata	DEER-EARS	UPL,FACU-	FACU-
Solidago elongata	GOLDEN-ROD,CREEK	FACU,FAC-	NI	Symphoricarpos albus	SNOWBERRY	UPL,FACU+	FACU-
Solidago flexicaulis	GOLDEN-ROD,ZIGZAG	FACU	FACU	Symphoricarpos orbiculatus	CORAL-BERRY	UPL,FAC-	NI
Solidago gigantea	GOLDEN-ROD,GIANT	FAC,FACW	FACW	Symphoricarpos oreophilus	SNOWBERRY,MOUNTAIN	UPL,FACU	UPL*
Solidago riddellii	GOLDEN-ROD,RIDDELL'S	OBL	OBL	Tamarix chinensis	TAMARISK,CHINESE	FACW	FACW
Solidago rigida	GOLDEN-ROD,STIFF	UPL,FACU	FACU-	Tamarix ramosissima	SALTCEDAR	FAC,FACW	NI
Sonchus arvensis	SOWTHISTLE,FIELD	UPL,FAC	FAC	Taraxacum officinale	DANDELION,COMMON	FACU-,FACU+	FACU
Sonchus asper	SOWTHISTLE,PRICKLY	FACU,FACW	FACW	Teucrium canadense	GERMANDER,AMERICAN	FAC+,FACW	FACW
Sonchus oleraceus	SOWTHISTLE,COMMON	UPL,FACU	FACU	Thalictrum dasycarpum	MEADOW-RUE,PURPLE	FAC,FACW	FAC
Sorbus scopulina	MOUNTAIN-ASH,GREENE'S	FACU?	NI	Thalictrum dioicum	MEADOW-RUE,EARLY	FACU+,FACW	FACW
Sorghastrum nutans	GRASS,INDIAN	UPL,FACW	FACU	Thelypodium integrifolium	THELYPODY,ENTIRE-LEAF	FACU-,FACW	FACW
Sorghum bicolor	BROOM-CORN	UPL,FAC	NI	Thelypteris thelypteroides	FERN,MARSH	FACW+,OBL	OBL
Sorghum halepense	GRASS,JOHNSON	FACU,FACU+	FACU	Thermopsis rhombifolia	FALSE-LUPINE,ROUND-LEAF	UPL,FAC	UPL
Sparganium androcladum	BURREED,BRANCHING	OBL	NI	Thlaspi arvense	PENNY-CRESS,FIELD	FACU?	NI
Sparganium chlorocarpum	BURREED,GREENFRUIT	OBL	OBL	Tilia americana	BASSWOOD,AMERICAN	FACU	FACU
Sparganium emersum	BURREED,NARROW-LEAF	OBL	OBL	Toxicodendron radicans	IVY,POISON	FACU,FACW	FACU
Sparganium eurycarpum	BURREED,GIANT	OBL	OBL	Toxicodendron rydbergii	IVY,RYDBERG POISON	FACU,FACW	FACU
Spartina gracilis	CORDGRASS,ALKALI	FACW	FACW	Tradescantia bracteata	SPIDER-WORT,LONG-BRACT	UPL,FAC	FAC
Spartina pectinata	CORDGRASS,PRAIRIE	FACW,OBL	FACW	Tradescantia occidentalis	SPIDER-WORT,PRAIRIE	UPL,FACW	UPL
Spergularia marina	SANDSPURRY,SALTMARSH	OBL	OBL	Trifolium beckwithii	CLOVER,BECKWITH'S	FAC,FAC+	FAC+
Sphaerophysa salsula	SWAINSONPEA,ALKALI	UPL,FAC	NI	Trifolium dubium	CLOVER,SUCKLING	UPL,FACU	UPL
Sphenopholis obtusata	WEDGEGRASS,PRAIRIE	FAC-,FACW+	FAC	Trifolium fragiferum	CLOVER,STRAWBERRY	FACU,FACW-	FAC
Spiraea alba	MEADOW-SWEET,NARROW-LEAF	FACW,FACW+	FACW	Trifolium hybridum	CLOVER,ALSIKE	FACU-,FAC	FACU
Spiraea betulifolia	MEADOW-SWEET,WHITE	FAC-?	NI	Trifolium pratense	CLOVER,RED	FACU-,FAC	FACU
Spiranthes cernua	LADIES'-TRESSES,NODDING	FACW-,FACW+	FACW	Trifolium repens	CLOVER,WHITE	FACU-,FAC	FACU
Spiranthes magnicamporum	LADIES'-TRESSES,GREAT PLAINS	UPL,FAC	FAC	Trifolium resupinatum	CLOVER,PERSIAN	UPL,FACU+	FACU+
Spiranthes romanzoffiana	LADIES'-TRESSES,HOODED	FACW,OBL	OBL	Triglochin concinnum	ARROW-GRASS,UTAH	OBL	OBL
Spiranthes vernalis	LADIES'-TRESSES,SPRING	FAC,FACW-	FACW-	Triglochin maritimum	ARROW-GRASS,SEASIDE	OBL	OBL
Spirodela polyrhiza	DUCKWEED,GREATER	OBL	OBL	Triglochin palustre	ARROW-GRASS,MARSH	OBL	OBL
Sporobolus airoides	SACATON,ALKALI	FAC-,FAC+	FAC	Trillium cernuum	TRILLIUM,NODDING	FAC,FACW	FAC
Sporobolus asper	DROPSEED,TALL	UPL,FACU	FACU	Trillium flexipes	TRILLIUM,WHITE	FACU,FAC	FACU
Sporobolus cryptandrus	DROPSEED,SAND	UPL,FACU	FACU	Triodanis perfoliata	VENUS'-LOOKING-GLASS,CLASP-LEAF	UPL,FAC	FAC
Sporobolus heterolepis	DROPSEED,PRAIRIE	UPL,FACU	UPL	Trisetum spicatum	FALSE-OATS,SPIKED	UPL,FACW-	FACU
Sporobolus neglectus	DROPSEED,PUFFSHEATH	UPL,FACU-	UPL	Typha angustifolia	CATTAIL,NARROW-LEAF	OBL	OBL
Sporobolus vaginiflorus	DROPSEED,POVERTY	UPL,FACU	UPL	Typha latifolia	CATTAIL,BROAD-LEAF	OBL	OBL
Stachys aspera	HEDGENETTLE,ROUGH	FAC+,FACW+	FACW	Ulmus americana	ELM,AMERICAN	FAC,FACW	FAC
Stachys hispida	HEDGENETTLE,SMOOTH	FAC,OBL	FAC	Ulmus rubra	ELM,SLIPPERY	FAC	FAC
Stachys hyssopifolia	HEDGENETTLE,HYSSOP-LEAF	FACW+,OBL	NI	Ulmus thomasii	ELM,ROCK	UPL,FAC+	FACU-
Stachys palustris	HEDGENETTLE,MARSH	FACW,OBL	OBL	Urtica dioica	NETTLE,STINGING	FACU,FACW	FACW
Stachys tenuifolia	HEDGENETTLE,SMOOTH	FACW-,OBL	FACW	Utricularia intermedia	BLADDERWORT,FLAT-LEAF	OBL	OBL

REGION 4 LIST OF PLANTS THAT OCCUR IN WETLANDS				REGION 4 LIST OF PLANTS THAT OCCUR IN WETLANDS			
Scientific Name	**Common Name**	**National Range Of Indicators**	**Regional Indicator**	**Scientific Name**	**Common Name**	**National Range Of Indicators**	**Regional Indicator**
Utricularia macrorhiza	BLADDERWORT,COMMON	OBL	OBL	Zizania aquatica	WILDRICE,ANNUAL	OBL	OBL
Utricularia minor	BLADDERWORT,LESSER	OBL	OBL	Zizia aptera	ALEXANDERS,HEART-LEAF	FACU,FACW-	FACW-
Uvularia sessilifolia	BELLWORT,SESSILE-LEAF	FACU-,FAC+	FACU	Zizia aurea	ALEXANDERS,GOLDEN	FAC-,FAC+	FAC-
Vaccinium membranaceum	BLUEBERRY,BIG	FACU,FACU+	FACU	Zosterella dubia	STAR-GRASS,WATER	OBL	OBL
Vaccinium scoparium	GROUSEBERRY	FACU-,FACU+	FACU				
Valeriana acutiloba	VALERIAN,SHARP-LEAF	FACU,FAC	FAC				
Valeriana dioica	VALERIAN,MARSH	FACW-,FACW	FACW-				
Valeriana edulis	VALERIAN,EDIBLE	FAC,OBL	FAC				
Vallisneria americana	WILD-CELERY	OBL	OBL				
Verbena bracteata	VERVAIN,PROSTRATE	UPL,FACW	FACU				
Verbena hastata	VERVAIN,BLUE	FAC,FACW+	FACW				
Verbena urticifolia	VERVAIN,WHITE	UPL,FAC+	FACU				
Verbesina encelioides	CROWNBEARD,GOLDEN	FACU-,FAC	FAC				
Vernonia baldwinii	IRONWEED,BALDWIN'S	UPL,FACW-	FACW-				
Vernonia fasciculata	IRONWEED,PRAIRIE	FAC,FACW	FACW				
Veronica americana	SPEEDWELL,AMERICAN	OBL	OBL				
Veronica anagallis-aquatica	SPEEDWELL,WATER	OBL	OBL				
Veronica arvensis	SPEEDWELL,CORN	FACU?	NI				
Veronica catenata	SPEEDWELL,PINK WATER	OBL	OBL				
Veronica officinalis	SPEEDWELL,COMMON	UPL,FACU	UPL				
Veronica peregrina	SPEEDWELL,PURSLANE	FACU-,OBL	FACW				
Veronica scutellata	SPEEDWELL,MARSH	OBL	OBL				
Veronica serpyllifolia	SPEEDWELL,THYME-LEAF	FAC,OBL	OBL				
Veronicastrum virginicum	CULVER'S-ROOT	FACU,FACW	FAC				
Viburnum edule	SQUASHBERRY	FACU,FACW	FACW				
Viburnum lentago	NANNYBERRY	FACU,FAC+	FACU				
Viburnum trilobum	CRANBERRYBUSH,AMERICAN	FAC,FACW	FAC				
Vicia americana	VETCH,AMERICAN PURPLE	FAC?	NI				
Vicia sativa	VETCH,COMMON	UPL,FACW	FACU				
Viola adunca	VIOLET,HOOKED-SPUR	FACU,FAC	FACU				
Viola conspersa	VIOLET,AMERICAN DOG	FACW-,FACW	FACW				
Viola incognita	VIOLET,LARGE-LEAF WHITE	FACU,FACW	FACW				
Viola missouriensis	VIOLET,MISSOURI	FAC,FACW+	FACW-				
Viola nephrophylla	VIOLET,NORTHERN BOG	FACW,FACW+	FACW				
Viola palustris	VIOLET,MARSH	FACW,OBL	NI				
Viola papilionacea	VIOLET,COMMON BLUE	FACU,FAC	FACU				
Viola pedatifida	VIOLET,PRAIRIE	UPL,FACU	FACU				
Viola pensylvanica	VIOLET,SMOOTH YELLOW	FACU,FACW	FACU				
Viola pratincola	VIOLET,BLUE PRAIRIE	FACU,FAC	FAC				
Viola pubescens	VIOLET,DOWNY YELLOW	FACU-,FAC-	FACU				
Viola renifolia	VIOLET,KIDNEY-LEAF WHITE	FAC,FACW	FACW				
Viola sororia	VIOLET,WOOLLY BLUE	FAC-,FAC	FAC				
Viola viarum	VIOLET,TWO-FLOWER	UPL,FACU	UPL				
Viola x bernardii		FACU-	NI				
Vitis riparia	GRAPE,RIVER-BANK	FACU,FACW	FAC				
Vitis vulpina	GRAPE,FROST	FAC,FACW-	FAC				
Vulpia octoflora	FESCUE,SIX-WEEKS	UPL,FACU+	FACU				
Wolffia columbiana	WATER-MEAL,COLUMBIA	OBL	OBL				
Xanthium spinosum	COCKLE-BUR,SPINY	FACU,FAC+	NI				
Xanthium strumarium	COCKLE-BUR,ROUGH	FAC-,FAC+	FAC				
Zannichellia palustris	PONDWEED,HORNED	OBL	OBL				
Zigadenus elegans	DEATHCAMAS,MOUNTAIN	UPL,FACW+	FACU				
Zigadenus venenosus	DEATHCAMAS,MEADOW	FAC	FAC				

APPENDIX C

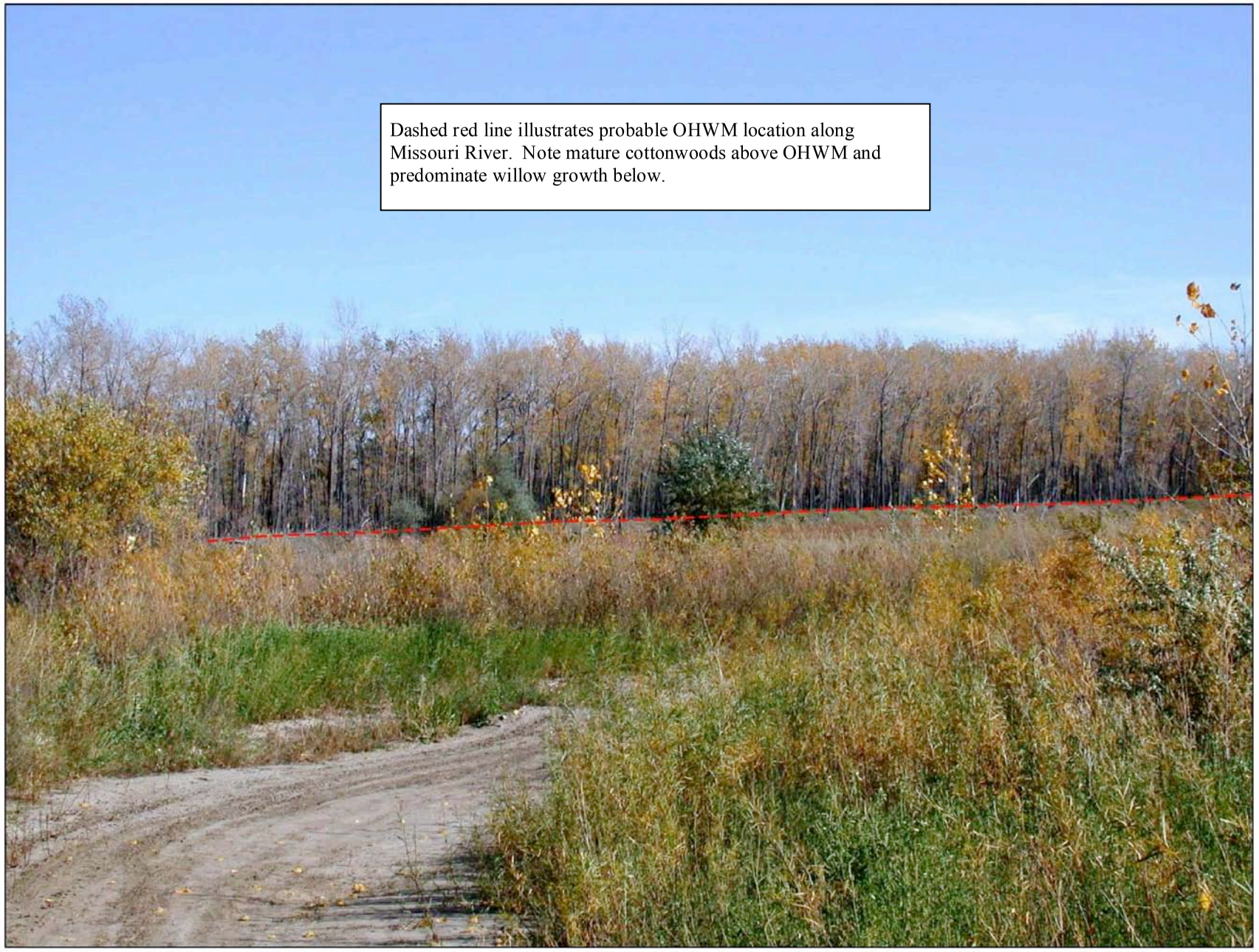
Example Photos


An example of development having destroyed vegetative and soil indicators. An OHWM delineation for this location may require extrapolation from another adjacent location.

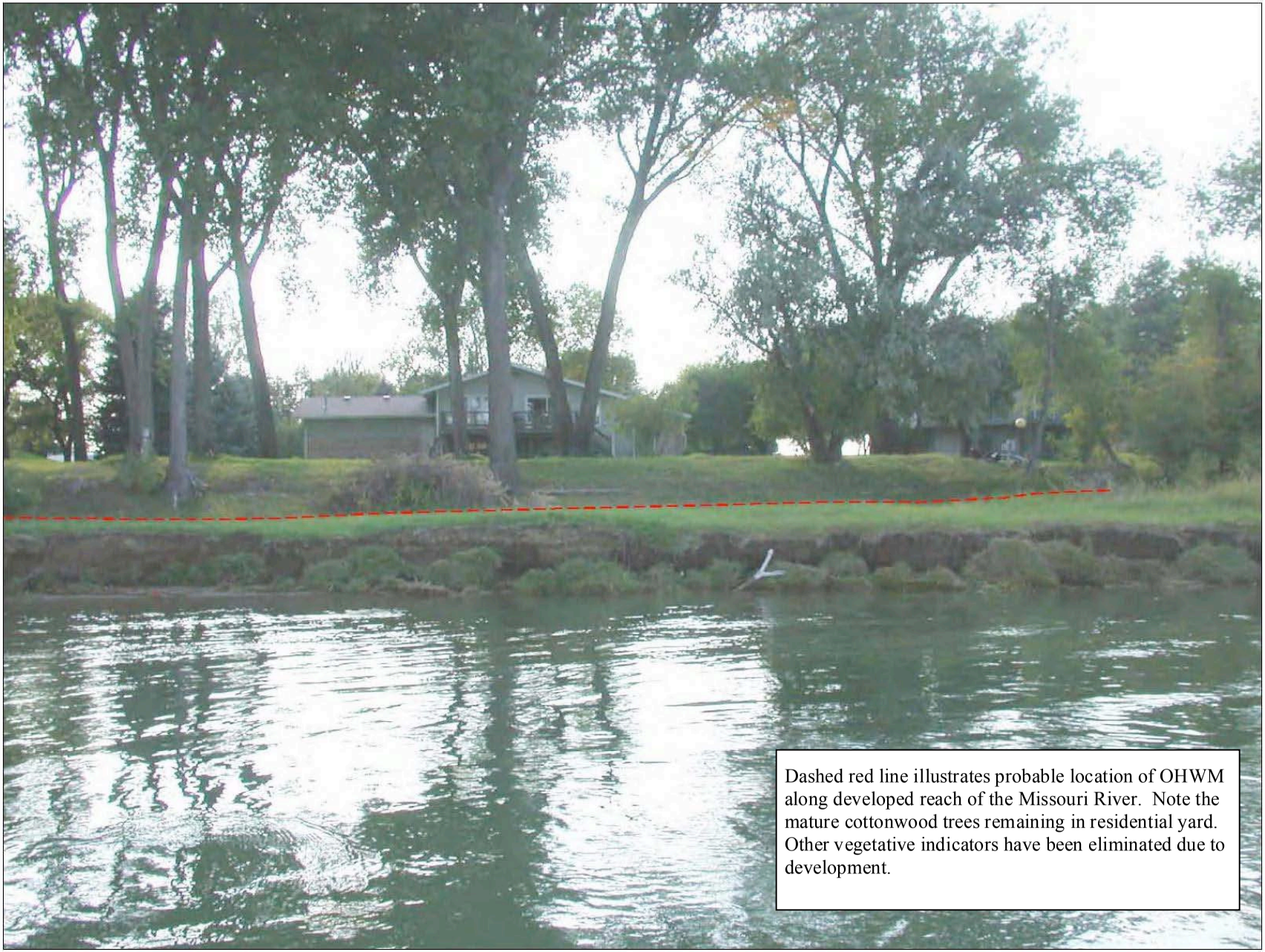


Looking south at Christmas Tree Island in the Missouri River north of Bismarck. Note cottonwood tree growth on island. Although no delineation has been completed for this area, it is possible for portions of islands to rise to an elevation above the OHWM.


Dashed red line in lower left illustrates OHWM as determined through litigation. Line to the right illustrates probable OHWM location on the opposite bank.


Dashed red line illustrates probable OHWM location along Missouri River. Note mature cottonwoods above OHWM and predominate willow growth below.


Dashed red line illustrates probable location of OHWM along Missouri River. Note mature cottonwoods above OHWM and predominate willow growth below.



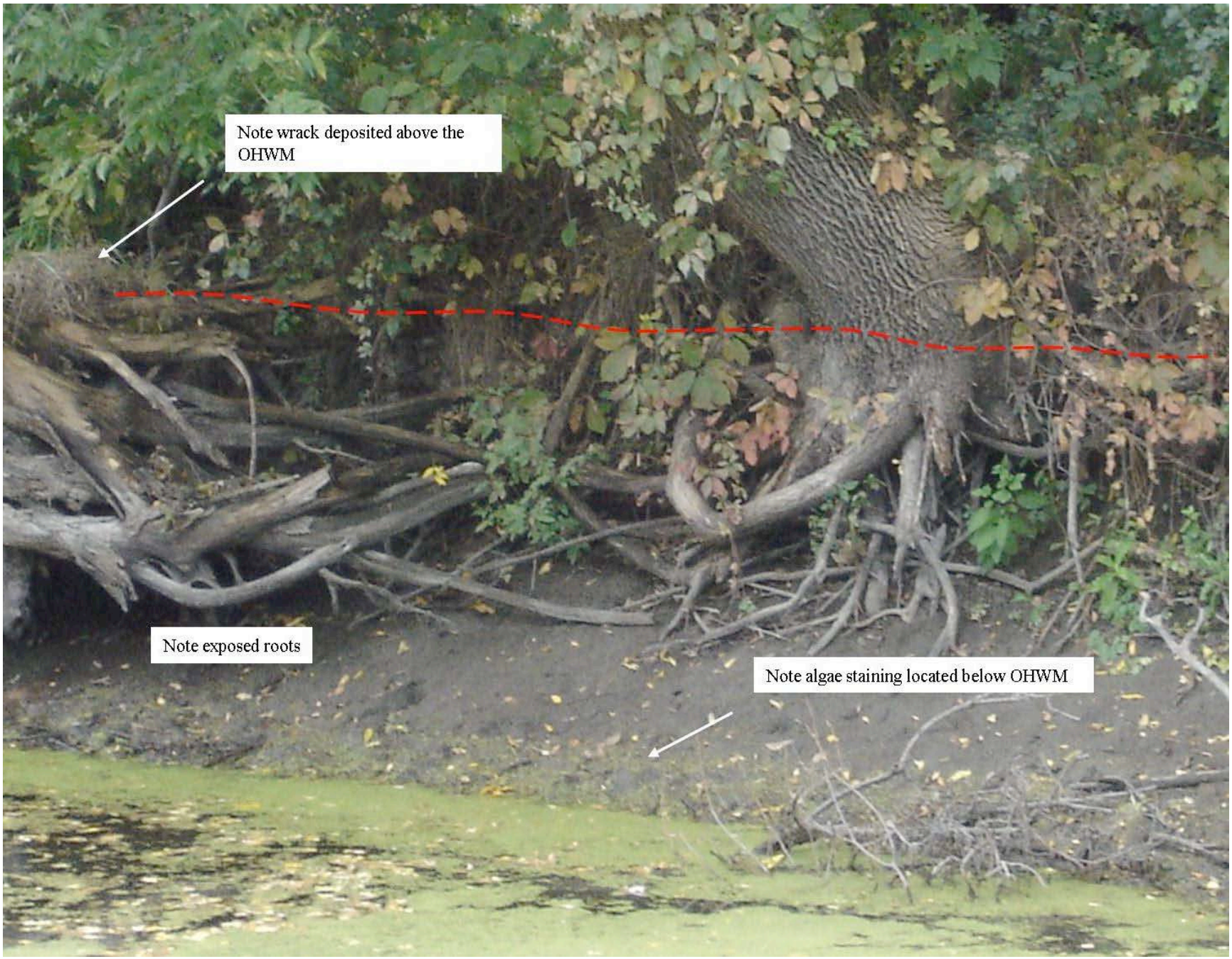
Dashed red line illustrates probable location of OHWM along developed reach of the Missouri River. Note the mature cottonwood trees remaining in residential yard. Other vegetative indicators have been eliminated due to development.

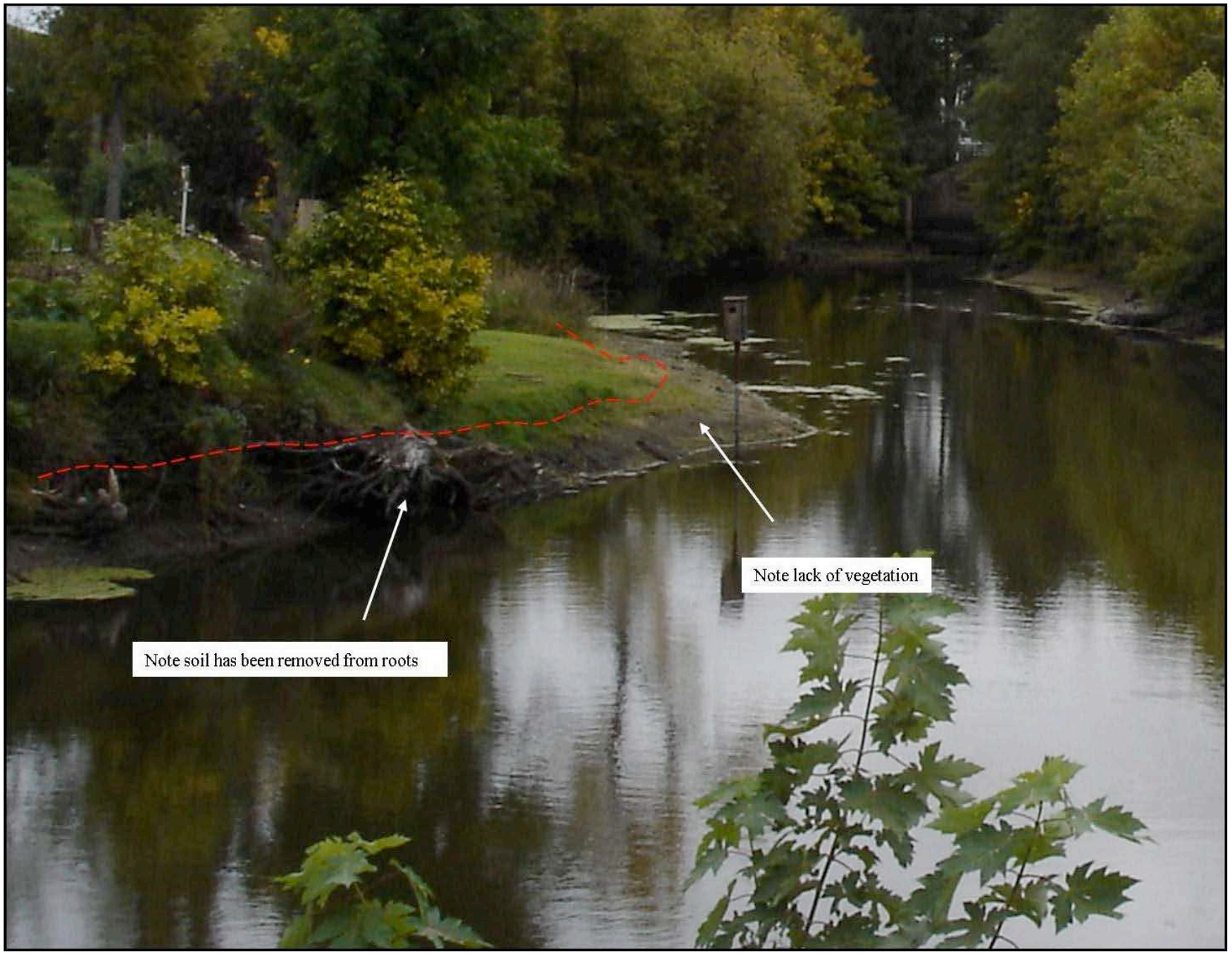
Dashed red line illustrates probable OHWM location along Missouri River. The OHWM is likely just stream side of the mature cottonwoods. The willowy sandbar area being used by recreators is likely below the OHWM.

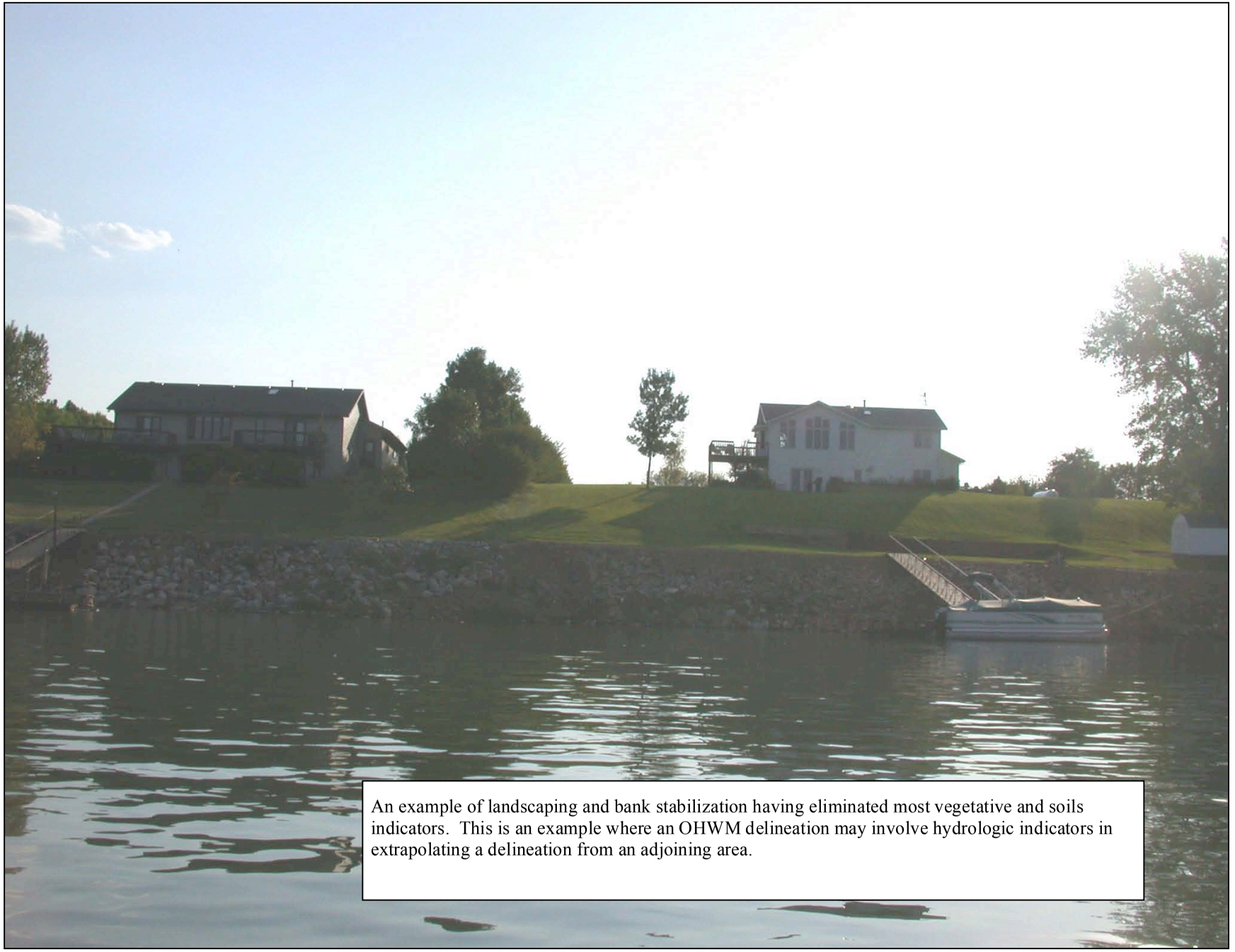

Likely OHWM based on water staining on bridge. OHWM is typically the bottom of the top dark band.

An example of algae staining on rocks along shore line.

Another example of water staining as an OHWM indicator.


Note wrack deposited above the OHWM
Note exposed roots
Note algae staining located below OHWM


Note soil has been removed from roots
Note lack of vegetation



An example of landscaping and bank stabilization having eliminated most vegetative and soils indicators. This is an example where an OHWM delineation may involve hydrologic indicators in extrapolating a delineation from an adjoining area.


Note distinct transition between terrestrial vegetation and area devoid of vegetation.

An example of flood-borne debris likely deposited above the OHWM.


The impact of the water on vegetation will be more obvious in some areas than in others.

Note the transition to terrestrial vegetation.


The Red River at a relatively high stage. The OHWM is likely located along the tree line.


Note the vegetation shift to shrubs.

An example of a location where delineation of the OHWM would likely require differentiation between wetland and non-wetland grass species.

An example of islands and a braided channel. A portion of the islands may or may not rise above the level of ordinary high water.

Appendix D

Glossary of Terms

Adaptation: A modification of a species that makes it more fit for existence under the conditions of its environment. These modifications are the result of genetic selection processes.

Aquatic Species: Plants that grow partly or wholly in water whether rooted or floating without anchorage.

Adventitious Roots: Roots found on plant stems in positions where they normally do not occur, often above the ground surface.

Aerobic: A situation in which molecular oxygen is a part of the environment.

Anaerobic: A situation in which molecular oxygen is absent (or effectively so) from the environment. This condition occurs during long term saturation of soil and will cause soils to display hydric indicators.

Basal area: The cross-sectional area of a tree trunk measured in square inches, square centimeters, etc. Basal area is normally measured at 4.5 ft above the ground level and is used as a measure of dominance. The most easily used tool for measuring basal area is a tape marked in square inches. When plotless methods are used, an angle gauge or prism will provide a means for rapidly determining basal area. This term is also applicable to the cross sectional area of a clumped herbaceous plant, measured at 1.0 in. above the soil surface.

Chroma: The relative purity or saturation of a color; intensity of distinctive hue as related to grayness; one of the three variables of color.

Diameter at breast height (DBH): The width of a plant stem as measured at 4.5 ft above the ground surface.

Dominance: A descriptor of vegetation that is related to the standing crop of a species in an area, usually measured by height, cover, or basal area (for trees).

Dominant species: As used herein, a plant species that exerts a controlling influence on or defines the character of a community.

Gaging Station: A point along a stream where instrumentation has been installed for measuring river stage and where a series of stage and stream discharge measurements have defined the relationship between stage and discharge, allowing the conversion of the daily stage record to a daily discharge record. The USGS operates a network of such gages across the nation.

Gleyed: A soil condition resulting from prolonged soil saturation, which is manifested by the presence of bluish or greenish colors through the soil mass or in mottles (spots or streaks) among other colors. Gleying occurs under reducing soil conditions resulting from saturation, by which iron is reduced predominantly to the ferrous state.

Herb: A non-woody individual of a macrophytic species. In this manual, seedlings of woody plants that are less than 3 feet in height are considered to be herbs.

Hydric Soil: A soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation. These soils display a matrix of gleyed or depleted colors.

Hydrology: The science dealing with the properties, distribution, and circulation of water.

Indicator: As used in this manual, an event, entity, or condition that typically characterizes a prescribed environment or situation; indicators determine or aid in determining whether or not certain stated circumstances exist.

Indicator status: One of the categories (e.g. OBL) that described the estimated probability of a plant species occurring in wetlands.

Inundation: A condition in which water from any source temporarily or permanently covers a land surface.

Mineral Soil: A soil consisting predominantly of, and having its properties determined predominantly by, mineral matter usually containing less than 20 percent organic matter.

Morphological adaptation: A feature of structure and form that aids in fitting a species to its particular environment (e.g. multiple trunks, adventitious roots).

Muck: Highly decomposed organic material in which the original plant parts are not recognizable.

Organic soil: A soil is classified as an organic soil if it is: (1) saturated for prolonged periods (unless artificially drained) and has more than 30 percent organic matter if the mineral fraction is more than 50 percent clay, or more than 20 percent organic matter if the mineral fraction has no clay; or (2) never saturated with water for more than a few days and having more than 34 percent organic matter.

Parameter: A characteristic component of a unit that can be defined. Vegetation, soil, and hydrology are three parameters that may be used to define wetlands.

Peak Flow: The highest instantaneous stream discharge recorded at a gaging station or projected by hydrologic methods where gage data or measurements are unavailable.

Plant community: All of the plant populations occurring in a shared habitat or environment

Saturated soil conditions: A condition in which all easily drained voids (pores) between soil particles in the root zone are temporarily or permanently filled with water to the soil surface at pressures greater than atmospheric.

Soil: Unconsolidated mineral and organic material that supports, or is capable of supporting, plants and which has recognizable properties due to the integrated effect of climate and living matter upon parent material, as conditioned by relief over time.

Soil matrix: The portion of given soil having the dominant color. In most cases, the matrix will be the portion of the soil having more than 50 percent of the same color.

Step-backwater Analysis: A method of hydraulic analysis based upon Bernoulli's energy equation.

Terrestrial Species: Plants that grow wholly on land and will show signs of stress when exposed to saturated conditions for any length of time. This may include some species that are considered to be wetland species (OBL, FACW, and FAC) and includes all non-wetland species (FACU and UPL).

Transition zone: The area in which a change from wetland to non-wetland occurs. The transition zone may be narrow or broad depending on location.

Watermark: A line on a tree or other upright structure that represents the maximum static water level reached during an inundation event.