## PENN 7 OPERATIONS AND MAINTENANCE PLAN

### FOR THE: ENGINEERING AND SITE DESIGN ACTIVITIES FOR RESTORATION OF EMERGENT COASTAL/FLOODPLAIN WETLANDS AT PENN 7 TOLEDO, OHIO

### PREPARED FOR: CITY OF TOLEDO

PREPARED BY: HULL & ASSOCIATES, LLC 219 S. ERIE STREET TOLEDO, OHIO 43604

**JUNE 2022** 



### TABLE OF CONTENTS

### PAGE

1.0	EXECUTIVE SUMMARY1		
2.0	ВАСКО	GROUND	2
3.0	GENER 3.1 3.2 3.3	AL SITE O&M	<b>3</b> 3 3 4 4 4 5 5 6
4.0	<b>0&amp;M (</b> <u>4.1</u> <u>4.2</u> <u>4.3</u> <u>4.4</u>	<b>DF SITE FEATURES</b> Water Control Structures         4.1.1 Operations         4.1.2 Maintenance         Dikes/Embankments         1         Forebay         1         Channel         1	7 7 7 9 0 1 2
5.0	INVAS <u>5.1</u> <u>5.2</u> <u>5.3</u> <u>5.4</u> <u>5.5</u> <u>5.6</u> <u>5.7</u>	IVE PLANT SPECIES CONTROL	<b>3</b> <u>3</u> <u>4</u> <u>4</u> <u>4</u> <u>5</u> <u>5</u> <u>6</u>
6.0	CONC	LUSION	7

### LIST OF FIGURES

|--|

- Figure 2 Site Layout with Proposed Improvements
- Figure 3 Site Map
- Figure 4 Site Map

### LIST OF APPENDICES

- Appendix A Site Inspection Form
- Appendix B Water Control Structure Photo Pages
- Appendix C As-Built Planting Plan

### TABLE OF CONTENTS (continued)

Appendix D Invasive Plants Fact Sheets

Amur, Morrow's & Tatarian Honeysuckle Garlic Mustard Common Reed Grass (Phragmites) Reed Canary Grass Japanese Knotweed Narrow-leaved and Hybrid Cattail Flowering Rush

### 1.0 EXECUTIVE SUMMARY

The Site consists of a 58.86-acre property on the lower Maumee River located at 3300 N Summit Street R, Toledo, Lucas County, Ohio and is designed to operate passively with minimal O&M requirements. Below is a summary of the anticipated required O&M activities:

- Mow and clear identified portions of the Site annually (at a minimum)
- Inspect the Site annually, at a minimum. This inspection involves the following:
  - Perimeter site walk
  - Inspection of trees/shrubs for needed maintenance
  - Inspection of site features
  - Identification of invasive species
  - Completion of the Site Inspection Form (Appendix A)
- Management of invasive species, as needed

Additional operation requirements for the water control structures would be needed if active management of the Site is desired. The above O&M activities and potential active management activities are discussed in detail in subsequent sections of this report.

#### 2.0 BACKGROUND

The City of Toledo (City) was a subawardee for a grant the Great Lakes Commission (GLC) received from the National Oceanic and Atmospheric Administration (NOAA) to complete engineering and site design activities for the restoration of 15.2 acres of emergent coastal/floodplain wetland habitat at a 58.86-acre property (Site) on the lower Maumee River located at 3300 N Summit Street R, Toledo, Ohio.

The Site includes Penn 7, which is a historic confined disposal facility (CDF) containing sediments dredged from the Maumee River, an open water embayment area, and an additional area of fill located north of the embayment adjacent to the CSX railroad bridge (Figure 1). Prior to the implementation of the restoration project, the existing perimeter containment berms, which range from approximately 3 feet to 12 feet (height from river bottom), surrounded the perimeter of Penn 7 and created a low interior with hydric soils that supported some wetland vegetation. The wetland was usually isolated from the river, dried completely for at least a portion of the year, and had little value as wildlife habitat, as the wetland area was dominated almost completely by invasive Reed Canary Grass. Constructing a hydrologic connection between Penn 7 and the lower Maumee River restored emergent coastal/floodplain wetlands and created essential fish and wildlife habitat.

The completed restoration project resulted in the restoration of emergent coastal/floodplain wetland habitat at this location by creating a wetland area within the CDF and a forebay and open water habitat in the open water embayment area, which is connected to the wetland area by a new channel. A dike across the open water embayment area was constructed to create protected and enhanced open water habitat, and three water control structures were installed to permit management of water levels and assist in control of invasive species in the wetland and open water embayment. The remainder of the CDF consists of a forested upland area. The site improvements overlaying the pre-restoration conditions are shown on Figure 2.

This operations and maintenance (O&M) plan was prepared by Hull & Associates, LLC (Hull) for the City based on the project team's identification of the anticipated inspection and maintenance needs to support the completed restoration of the Penn 7 Emergent Coastal Floodplain Wetlands Restoration Project. The subsequent sections discuss general O&M requirements for the Site (Section 3.0), O&M requirements for the new site features (i.e., water control structures, dikes, etc.) (Section 4.0), and methods for controlling invasive plant species within the Site (Section 5.0).

#### 3.0 GENERAL SITE O&M

#### 3.1 Annual Inspection

Upon completion of construction, annual inspections of the Site should be performed during the growing season by a trained inspector (i.e., familiar with this O&M plan and can identify invasive species). It is recommended to conduct the annual inspection around July 1<sup>st</sup>, when the fish grates are recommended to be raised (see Section 4.1.1). A perimeter site walk should be completed to check for indications of trespassing and damage to the perimeter fence and gates and to inspect the trees and shrubs for needed maintenance as described in Section 3.3. To verify that the site features are appropriately operating, water levels should be measured utilizing the staff gauges located within the water control structures on-site, and photographs should be taken showing the water level within the Site at the designated photo locations. Each of the site features should also be inspected as described in Section 4.0. Any invasive plant species observed during the perimeter site walk should be noted so the appropriate removal and control measures may be implemented as soon as possible or when appropriate as described in Section 5.0. Findings of the annual inspection should be reported to the Commissioner of the City's Division of Parks, Recreation and Forestry and any necessary maintenance activities should be implemented as soon as possible. See Figures 3 and 4 for the potential perimeter site walk route and designated photo locations.

During the annual inspection and any additional inspections that may be performed, the Site Inspection Form (Appendix A) should be completed by a trained inspector. A hardcopy of the Site map (Figures 3 and 4) is recommended to be taken on all inspections and included as an attachment to the Site Inspection Form so the locations of any issues identified during the inspection may be noted. The Site Inspection Form shall be submitted to the Commissioner of the City's Division of Parks, Recreation and Forestry following completion of the inspection.

#### 3.2 Mowing and Clearing

The Summit Street edge of the Site/property shall be mowed at least annually to keep an area along the perimeter fence line cleared. In addition, the path used to conduct the perimeter site walk shall be cleared at least annually to permit access around the entire Site, and a path to the forebay and channel shall be cleared as needed to permit removal of debris and dredging of sediment. If feasible, it is recommended to mow these areas once in the spring and once in the fall. See Figures 3 and 4 for approximate mowing and clearing locations.

#### 3.3 Tree and Shrub Maintenance

The following sections related to tree and shrub maintenance have been provided by Deitering Landscaping, the landscape subcontractor for the wetland restoration activities at the Site, for inclusion in this O&M plan. Minor modifications were made by Hull for clarification purposes.

### 3.3.1 Staking of Trees

Trees that have been staked should remain staked for one year (until July 2022 for trees planted during construction), and then tree stakes and ties should be removed.

### 3.3.2 Herbicides

Trees and shrubs may be sensitive to the herbicides applied to nearby fields or lawns. Multiple exposures each year to these damaging chemicals may cause stress, increasing the risk of insect damage or disease and reducing the effective life of a tree. Be aware of wind conditions that may cause herbicides to drift and exercise caution when applying herbicides in or near your trees.

### 3.3.3 Pruning

Branches damaged by ice, wind, animal grazing, or bird roosting should be removed. Damage to the central leader causes the lateral branches to assume the role of the central leader and begin to grow upward. If left to grow, a double leader may develop, creating a weak spot in the trunk as the tree matures. Forked and multi-stemmed trees are prone to wind breakage, and don't grow as tall as single stem trees.

When done properly, pruning can improve a tree's healthy appearance, as well as increase the life expectancy of the tree. Proper pruning opens the canopy of the tree to permit more air movement and sunlight penetration.

Done improperly, pruning can decrease the tree's life expectancy or even kill it. Because trees are living organisms, they can be profoundly affected by pruning practices. Tree care professionals adhere to accepted standard of practices when pruning trees.

The American National Standard for tree pruning, designated as ANSI A300, has been in existence since 1995. Its development was approved by the American National Standards Institute. This pruning standard should be followed in all pruning situations and all geographic areas. Knowing how certain tree species grow within a given environment may alter how the recommendations of A300 are interpreted.

The following information is designed to help you understand exactly what will be accomplished in a pruning operation.

#### 3.3.3.1 Making Cuts

Branches should be removed with thinning cuts. A thinning cut either removes a branch at its point of origin or shortens it back to a lateral branch that is large enough to assume the terminal role.

Branches should not be removed with heading or topping cuts. A heading cut is when a currently growing or one-year-old shoot is cut back to a bud, or when a larger limb is cut back to a stub or a lateral that is not big enough to assume the terminal role. Heading should rarely be used in shade and ornamental tree pruning, since it forces the growth of multiple upright sprouts that are weakly attached to the parent stem. Drastic heading can kill the tree outright.



Figure 1 - Removing a large lateral branch requires two preliminary cuts before the final cut

### 3.3.3.2 Hazard Reduction Pruning

Hazard reduction pruning is recommended when the primary objective is to reduce the danger to a specific target caused by visibly defined hazards in a tree. For example, hazard reduction pruning may be the primary objective if a tree had many dead limbs over a park bench.

### 3.3.3.3 Maintenance Pruning

Maintenance pruning is recommended when the primary objective is to maintain or improve tree health and structure and includes hazard-reduction pruning. An example here might be to perform a maintenance pruning operation on trees along the edge of the property or trails that may be more visible to the public.

### 3.3.3.4 Pruning Types

Hazard reduction pruning and maintenance pruning should consist of one or more of the pruning types noted below.

- **Crown cleaning** consists of the selective removal of one or more of the following items: dead, dying, or diseased branches, weak branches and waterspouts.
- **Crown thinning** is the selective removal of branches to increase light penetration, air movement, and reduce weight.
- **Crown raising** consists of the removal of the lower branches of a tree to provide clearance.
- **Crown reduction**, also called crown shaping, decreases the height and/or spread of a tree. Consideration should be given to the ability of a species to sustain this type of pruning.
- **Vista pruning** is selective thinning of framework limbs or specific areas of the crown to allow a view of an object from a predetermined point.
- **Crown restoration** pruning should improve the structure, form and appearance of trees which have been severely headed, vandalized, or storm damaged.

When you contract a company to prune trees, you should obtain a verbal or written commitment that, "All pruning shall be done in accordance with the ANSI A300 standard for tree pruning." This means that the overall pruning operation is going to stay within specific bounds, which includes the following:

- Proper cuts will be made,
- Not more than one-fourth, or 25 percent, of the foliage of the canopy or individual limbs should be removed in any one season, and
- When pruning is completed, at least half the foliage should remain evenly distributed in the lower two-thirds of the canopy.

### 4.0 O&M OF SITE FEATURES

### 4.1 Water Control Structures

#### 4.1.1 Operations

The Site is designed to operate passively, however, water control structures with stoplogs and fish grates have been incorporated to permit active management and facilitate maintenance. These water control structures are located at the wetland inlet/outlet, within the connecting channel and within the dike at the open water embayment inlet/outlet (Figures 3 and 4). See Appendix B for photos of the water control structures.

Water levels within the Site shall be managed through either passive or active management. Under passive management, the water level within the Site will be controlled by the water level of the Maumee River and Lake Erie. While it is anticipated that passive management of water levels will be the preferred default long-term practice, active management may be appropriate to address specific conditions or goals. Examples of situations where active management may be appropriate include for the management of invasive species, to perform required repairs, during extreme water levels in Lake Erie, or during harmful algal blooms (HABs).

If active management is desired to help manage invasive species more effectively, it is recommended to vary the water depth in the Site depending on the season and year. During the first year of active management, stoplogs should be inserted during late spring to flood the target area(s) 12 to 18 inches (see Table 1 for required number of stoplogs). In three (3) to five (5) years, the stoplogs should be removed, except for the bottom stoplog, during May or June to allow drawdown to encourage native plant establishment. Stoplogs should then be inserted to reestablish the 12 to 18-inch water depth in the target area(s) during early Autumn. The drawdown should again occur in three (3) to five (5) years and this process should be continued as long as active management is desired to manage invasive species, or in accordance with a specific active management plan that is developed in the future. Note that after flooding to manage invasive species, it may be necessary to reseed/plant the flooded areas. The as-built planting plan provided by the Contractor is provided in Appendix C for reference to appropriate species to plant in each area.

### PENN 7 OPERATIONS AND MAINTENANCE

### TABLE 1

Wetland and G	Channel WCS	Open Water En	nbayment WCS⁴
Target Elevation (feet) <sup>1,3</sup>	Number of Stoplogs <sup>2,3</sup>	Target Elevation (feet) <sup>1,3</sup>	Number of Stoplogs <sup>2,3</sup>
571	4-5	570	4-5
572	6-7	571	6-7
573	8-9	572	8-9
574	10-11	573	10-11
575	12-13	574	12-13
>575	14	575	14

#### ACTIVE MANAGEMENT FOR INVASIVE SPECIES CONTROL

See Figures 3 and 4 to determine the target elevation based on the identified target area(s). Use the higher bounding contour as the target elevation.

<sup>2</sup> The number of stoplogs includes the bottom stoplog, which should always remain within the water control structures, and should flood the area approximately 12 to 18 inches above the target elevation.

<sup>3</sup> Each WCS has a staff gauge that can be used to check current water levels and as a reference to manage the stoplogs. The Wetland and Channel WCS have an interior bottom elevation of approximately 570' while the Open Water Embayment WCS has an interior bottom elevation of approximately 569'.

<sup>4</sup> The embayment water control structure has a maximum number of 14 stoplogs. Note that there is low permeability material installed on the embayment side of the dike up to an elevation of 574'. Water levels may be temporarily managed above this elevation, but note there maybe seepage through dike over the long-term.

If repairs are needed that require water levels within the Site to be controlled, the maximum number of stoplogs should be installed in the appropriate WCSs and the weekly forecast from the United States Army Corps of Engineers (USACE) should be checked for Lake Erie to verify that water levels are not anticipated to exceed the maximum stoplog elevation (i.e., 576 feet for the open water embayment and 577 feet for the wetland area) during the proposed repair work. Weekly forecasts are available at the following link: <a href="https://www.lre.usace.army.mil/Missions/Great-Lakes-Information/Great-Lakes-Water-Levels/Water-Levels/Weekly-Great-Lakes-Water-Levels/Water-Levels/Weekly-Great-Lakes-Water-Levels/Water-Levels/Water-Levels/Weekly-Great-Lakes-Water-Levels/Water-Levels/Weekly-Great-Lakes-Water-Levels/Water-Levels/Water-Levels/Weekly-Great-Lakes-Water-Levels/

Active management for extreme water levels in Lake Erie would involve installing stoplogs to either prevent the raising or lowering of water levels in the Site as the Maumee River and Lake Erie water levels fluctuate. In general, when extreme low-water levels are forecasted, stoplogs may be recommended to be installed to prevent the drawdown of water within the Site and when extreme high-water levels are forecasted, stoplogs may be installed to prevent the raising of water levels. If this type of active management is desired, it is recommended to develop an active management plan that considers the anticipated low- and highwater levels as well as the probable seiche events.

When HABs are present in Lake Erie and/or the Maumee River, the HABs may enter the Site when the Maumee River flows upstream due to changes in weather conditions. To prevent this, the maximum number of stoplogs could be inserted to hydraulically disconnect the Site from the Maumee River. However, the Site

should be inspected for evidence of HABs already within the Site prior to installing the stoplogs and the stoplogs are recommended to be removed after flow in the Maumee River changes direction again (i.e., resumes flowing downstream). A decision to install stoplogs for this situation may be made based on the weather forecast and if the Maumee River flow direction is anticipated to quickly change back to flowing downstream. The NOAA National Centers for Coastal Ocean Science maintains a Lake Erie Harmful Algal Bloom Forecast website that may be monitored to help make decisions for when to hydraulically disconnect the Site due HABs. This forecast is available following link: to at the https://coastalscience.noaa.gov/research/stressor-impacts-mitigation/hab-forecasts/lake-erie/

Note that under some conditions (e.g., extreme low- and high-water levels, etc.) temporary pumping of water (i.e., with a portable pump) from the Maumee River into the Site or from the Site into the Maumee River may be required to achieve the required water depth for invasive species management or repair work during active management. Note that water levels within the wetland and embayment areas may be controlled separately by utilizing the water control structure within the connecting channel, as desired.

When preventing Carp from entering the Site, the fish grates should be lowered into place when water temperatures are between 50 to 73 degrees Fahrenheit to reduce their use of the wetland for spawning. This temperature range generally corresponds to the time period between April 1<sup>st</sup> and July 1<sup>st</sup>. It is suggested that these dates be used as a rough guide on when to lower and raise the fish grates to ensure they are being used most effectively.

A more detailed active management plan may be developed based on this information and the installed structures, as desired.

### 4.1.2 Maintenance

The water control structures shall be inspected by a trained inspector as part of the annual inspection described in Section 3.1 for seepage through stop logs, sloughing of revetment, damage, and excessive piling of debris and/or sediment deposition at the culvert inlet/outlet and on the trash racks. The water level at the time of inspection should also be noted

Signs of sloughing may include slumping or displacement of the revetment on either side of the water control structure and visual signs of embankment erosion due to low spots creating concentrated stormwater flow, such as visible scour or cuts in the embankment exposing earth fill, aggregate fill (recycled concrete) or geotextile fabric. If any sloughing is observed, the observation shall be documented and photographed and provided to the Commissioner of the City's Division of Parks, Recreation and Forestry. The Commissioner shall

consult with an engineer as needed, determine if any corrective measures are required and implement the identified corrective measures.

The inspector should visually inspect all components of the water control structure (i.e., culvert pipe, catch basin, stoplogs, and fish grate) that are visible or accessible at the time of the inspection. Any components that are not able to be visually inspected at the time of inspection should be noted. It may be necessary to perform another inspection when the water level has lowered if there is reason to expect these components may be damaged. Any damage observed should be documented, photographed and reported to the Commissioner of the City's Division of Parks, Recreation and Forestry. The Commissioner shall consult with an engineer as needed, determine if any corrective measures are required and implement the identified corrective measures.

The water control structures should also be inspected for excessive piling of debris and/or sediment deposition at the culvert inlet/outlet that would restrict stormwater flows. Note that there are trash racks on both culverts for the Wetland, Channel, and Open Water Embayment WCSs to minimize clogging of the WCSs. If excessive piling of debris and/or sediment deposition appear to be concentrating stormwater flow to a certain area of the structure, the inspector shall document and photograph the restriction and report it to the Commissioner of the City's Division of Parks, Recreation and Forestry. The Commissioner shall prepare and implement a suitable plan for removing debris or sediment, as needed, from the forebay.

### 4.2 Dikes/Embankments

The dikes and embankments, which includes the channel crossing, (see Figures 3 and 4 for location) shall be inspected by a trained inspector as part of the annual inspection described in Section 3.1 for seepage, settlement, erosion, sloughing of revetment, and excessive piling of debris.

Signs of sloughing may include slumping or displacement of the revetment on either side of the dike or channel crossing and visual signs of embankment erosion due to low spots creating concentrated stormwater flow, such as visible scour or cuts in the embankment exposing earth fill, aggregate fill (recycled concrete) or geotextile fabric. If any sloughing is observed, the observation shall be documented and photographed and provided to the Commissioner of the City's Division of Parks, Recreation and Forestry. The Commissioner shall consult with an engineer as needed, determine if any corrective measures are required and implement the identified corrective measures.

Note that there is low permeability material (AquaBlok<sup>®</sup>) installed under the revetment stone on the sideslope on the embayment side of the dike from the toe to an elevation of 574' to support management of water levels over the long-term. This material is also located on the interior (Wetland) side sideslope of the perimeter dike around the Wetland Water Control Structure pipe to prevent seepage along this pipe. If this material appears disturbed or if seepage is observed through these locations, the observation shall be documented and photographed and provided to the Commissioner of the City's Division of Parks, Recreation and Forestry. The Commissioner shall consult with an engineer as needed, determine if any corrective measures are required and implement the identified corrective measures.

Signs of settlement may include low spots along the pathway where stormwater may accumulate. If any settlement is observed, the observation shall be documented and photographed and provided to the Commissioner of the City's Division of Parks, Recreation and Forestry. The Commissioner shall consult with an engineer as needed, determine if any corrective measures are required and implement the identified corrective measures.

The inspector shall visually inspect all portions of the dike and channel crossing that are visible at the time of the inspection for signs of erosion. It may be necessary to perform a follow up inspection when the water level has lowered if a significant portion of the dike or channel crossing is not visible and there is reason to believe it may be damaged. Signs of erosion include displacement of the revetment on either side of the dike or channel crossing and exposed aggregate fill (recycled concrete) or geotextile fabric. If any significant erosion is observed, the observation shall be documented and photographed and provided to the Commissioner of the City's Division of Parks, Recreation and Forestry. The Commissioner shall consult with an engineer as needed, determine if any corrective measures are required and implement the identified corrective measures.

The dikes and channel crossing should also be inspected for excessive piling of debris and/or sediment deposition. If excessive piling of debris and/or sediment deposition appear to be concentrating stormwater flow to a certain area of the dike or channel crossing, the inspector shall document and photograph the restriction and report it to the Commissioner of the City's Division of Parks, Recreation and Forestry. The Commissioner shall prepare and implement a suitable plan for removing debris or sediment, as needed, from the dikes or channel crossing.

### 4.3 Forebay

The forebay (see Figure 4 for location) shall be inspected by a trained inspector as part of the annual inspection described in Section 3.1 to monitor the piling of debris and sediment. Debris should be removed from the forebay when it is preventing the forebay from operating as designed. It is recommended to remove accumulated sediment before sediment overtops the forebay. Excessive piling of debris or sediment, particularly areas that are causing flow restrictions, should be documented, photographed and reported to

the Commissioner of the City's Division of Parks, Recreation and Forestry. The Commissioner shall prepare and implement a suitable plan for removing debris or sediment, as needed, from the forebay.

### 4.4 Channel

The channel (see Figure 3 for location) shall be inspected by a trained inspector as part of the annual inspection described in Section 3.1 to monitor the piling of debris and sediment. Debris and sediment should be removed from the channel when it is obstructing flow and fish passage through the channel. Excessive piling of debris or sediment, particularly areas that are causing flow restrictions, should be documented, photographed and reported to the Commissioner of the City's Division of Parks, Recreation and Forestry. The Commissioner shall prepare and implement a suitable plan for removing debris or sediment, as needed, from the channel.

### 5.0 INVASIVE PLANT SPECIES CONTROL

Invasive plant species that are common to the Site or are known to be within the vicinity of the Site and may translocate in the future, include but are not limited to cattail (*Typha Spp.*), common reed (*Phragmites Australis*), garlic mustard (*Alliaria Petiolata*), reed canary grass (*Phalaris Arundinacea*), honeysuckle (*Lonicera Spp.*), Japanese knotweed (*Polygonum Cuspidatum* or *Fallopia Japonica*), and flowering rush (*Butomus umbellatus*). Invasive species are recommended to be monitored and controlled so that no single species achieves greater than 5% coverage or alters the desired community structure of the Site. During the annual inspection described in Section 3.1, the location and approximate coverage of all observed invasive species should be documented, photographed and reported to the Commissioner of the City's Division of Parks, Recreation and Forestry by a trained inspector. The Commissioner shall prepare and implement a suitable plan for controlling all observed invasive species, as needed. Control measures include herbicides, mowing, flooding, burning, and mechanical methods (cutting and pulling), among others. Herbicide application can be used in conjunction with mechanical methods to reduce the amount of herbicide applied. Any herbicide application.

Removal and control methods for each of the above-mentioned species are discussed in Sections 5.1 through 5.7 below. Note that Deitering Landscaping, the landscape subcontractor for the wetland restoration activities at the Site, recommended the use of Liberty Herbicide or similar and that invasive species application should start in June and be continued through the remainder of the year, as needed. Fact sheets from the Ohio Invasive Plants Council (OIPC) and Minnesota Department of Natural Resources are provided in Appendix D to assist in the identification of these invasive plant species (other fact sheets are available online). For species not listed here, or for additional identification resources of the listed species, visit these websites: Ohio Department of Natural Resources (https://ohiodnr.gov/wps/portal/gov/odnr/discover-andlearn/safety-conservation/fish-management/aquatic-invasive-species/links-pubs-aquatic-invasives), Ohio 901:5-30-01 Administrative Code (http://codes.ohio.gov/oac/901%3A5-30), OIPC (https://www.oipc.info/), and United States Geological Survey NAS - Nonindigenous Aquatic Species (https://nas.er.usgs.gov/). In addition, free applications (e.g., PictureThis and PlantSnap) that may help with plant identification in the field are available for download to mobile devices.

### 5.1 Cattail (Typha Spp.)

Cattail species are very aggressive colonizers with an extensive rhizomatous root system that if it becomes established can be extremely difficult to eliminate. Hand pulling or digging may be effective on small or very young plants. This will be very labor intensive particularly if the plant becomes well established. Care should be given to removing the entire root structure or regrowth from broken roots may occur. However, once a stand becomes established, the extensive root system will make hand pulling or digging very difficult and potentially ineffective. Seed head removal can be conducted but treatment should take place before seed head establishment. Seed heads should be bagged immediately and removed from the Site. Many control measures have been tried in the past including mowing, flooding, and burning but the most effective control method has been herbicide application. Glyphosate has been shown to be an effective control measure but usually takes two or three seasons of applications to eliminate dense stands. The most effective means of control of cattail has been application of herbicides such as glyphosate that can be sprayed or applied by a wicking device. Herbicide application is recommended to occur in August.

### 5.2 Common Reed (Phragmites Australis)

Common reed is a very aggressive grass with an extensive rhizomatous root system that if it becomes established can be extremely difficult to eliminate. Hand pulling or digging may be effective on small or very young plants. This will be very labor intensive particularly if the plant becomes well established. However, once a stand becomes established, the extensive root system will make hand pulling or digging very difficult and potentially ineffective. Many control measures have been tried in the past including mowing, flooding, burning, and covering with black plastic but the most effective control method has been herbicide application. Glyphosate has been shown to be an effective control measure but usually takes two or three seasons of applications to eliminate dense stands. The most effective means of control of common reed has been application is recommended to occur in August. Common reed is shade intolerant and once the planted shrub and forested species provide a canopy that shades the replacement or restoration areas, common reed should not be a concern in mature forested areas. Periodic mowing may provide some control, but will likely not eliminate the plants. Other measures will likely be needed for long term control.

### 5.3 Garlic Mustard (Alliaria Petiolata)

Garlic mustard is a biannual plant that can form dense monotypic stands to the exclusion of native species. This plant grows in dense shade and can become established as a ground cover under upland forest canopy. Hand pulling and herbicides are the best management methodologies. Small infestations of garlic mustard can be controlled by hand pulling second year plants when they have started to flower. All the root must be removed since the roots can resprout. Collected plants should be placed in plastic bags and landfilled and not left on the ground or composted as they may remain alive and may yet produce seed.

### 5.4 Reed Canary Grass (Phalaris Arundinacea)

Reed canary grass is an aggressive wetland species that forms dense monotypic stands to the exclusion of other wetland species. It spreads by rhizomatous growth and seeds. Once established it can be difficult to adequately control due to resprouting from the soil seed bank. However, this herbaceous species should not be a problem once the shade canopy of the tree and shrub species become established in the replacement wetland area. Several methods of control are available each with moderate effectiveness. No one methodology will be fully effective if the reed canary grass is well established. Control methods include herbicides, burning, mowing or mechanical removal. Use of glyphosate has shown to have some success, being effective for up to two years. After two years, regrowth from the seed bank may reestablish the stand. Spraying large stands and or wicking small stands or individual plants will provide the best options. Repeated application will likely be needed and herbicides are recommended to be applied in June or July. Burning and twice-yearly mowing have also shown some success, but again resprouting from the seed bank will require management over multiple years. Removal using heavy construction equipment has not been shown to be effective due to rapid regrowth from rhizomes and seeds left in the soil.

### 5.5 Honeysuckle (Lonicera Spp.)

Bush honeysuckles, when established, exclude all other ground covers and shrubs. Honeysuckle produces fruits that are eaten by birds and disperse the seeds. They have a wide range of tolerance from partial to full sun. They are extremely invasive and can easily dominate a habitat.

Removal of small plants can be accomplished by pulling the seedlings and allow to desiccate. This will likely be the preferred control method, as any large shrubs should not be pulled. Control of large shrubs will require a combination of mechanical cutting and herbicide treatment of the stump. Shrubs should be cut with loppers, hand saw, or chainsaw. A smooth flat cut of the stem should be left. Each stump should then be treated with a dyed 20 percent solution of glyphosate. Cutting and treatment can be done any time of year. Cutting and herbicide treatment to the stump is very effective and the stumps should not resprout. However, cutting should not be done unless herbicide is also used. Cutting without herbicide will only result in dense resprouting. Reseeding the area after removal of the honeysuckle will help to reestablish a native herbaceous community.

### 5.6 Japanese Knotweed (Polygonum Cuspidatum or Fallopia Japonica)

Japanese knotweed is an aggressive perennial plant that sprouts from an extensive root and rhizome system. Roots can extend 20 feet from the plant and down 7 feet into the soil. Vegetative reproduction is likely the reason it is so successful at creating dense stands. Mechanical control means may be used, but any roots left in the soil will resprout. Herbicide applications will likely be required to control this species if it becomes established. Note that Japanese knotweed was identified on the southwest portion of Warrick Holdings, LLC property, along the northwest side of the channel. This area in particular should be monitored to confirm the Japanese knotweed is not spreading onto the site.

Herbicides should be used as a foliar application or injected into the plant stems. Foliar applications should be conducted in July to September, from flower bud to seeding stage. Foliar applications include risk of drift of herbicide to non-target species. Herbicides suitable for knotweed include glyphosate, imazapyr, and triclorpyr. Multiple years of treatment will be needed to fully eradicate the stand. In addition, the amount of herbicide that can be applied per acre is limited, typically 2 gallons per (2500 stems) per acre.

Hand pulling can be used on individual plants. This can be done when individual plants are in a small area, and must be repeated often during the growing season. When observed, plants should be pulled and bagged for disposal in a landfill. Do not leave on the ground as stems and stem fragments can root. Cutting can be effective on small patches, but requires repeated events. Stems must be cut twice a month from April to August and then once a month until frost. Cutting will stimulate growth and tends to produce numerous small shoots. Repeated cutting when the plants are small, six inches or less, deprives the plants of energy. When cut all fragments must be collected and bagged for disposal. Using herbicides on the final resprouts after a season of hand pulling is recommended as an effective control method.

### 5.7 Flowering Rush (Butomus umbellatus)

According to "Status and Strategy for Flowering Rush (*Butomus umbellatus L.*) Management" by R.A. Hackett and A.K. Monfils in 2014, flowering rush is an exotic plant that grows as an emergent along shorelines and submersed in lakes and rivers. It spreads by rhizome making removal and management difficult. This exotic can grow in thick stands and interfere with boating and recreation. This plant can also crowd out native plants, which fish and wildlife often rely on. The flowers grow in umbrella shaped clusters and the leaves can grow up to three feet in height. It can closely resemble native rushes if the plant is not in flower. Species that are often mistaken for flowering rush include *Sparangium spp*. and species of *Schoenoplectus* with triangular stems.

Flowering rush is sensitive to changes in water level and can easily invade areas not previously occupied by plants following water level changes. There were few effective methods found to control flowering rush and most research has been conducted on the infertile (triploid) populations, whereas fertile (diploid) populations are found more frequently in the Great Lakes basin. It is possible that the control methods for infertile populations may not be as effective with fertile populations. Control methods include cutting, hand digging, and herbicides (e.g., glyphosate, penoxsulam). No herbicide is selective to flowering rush and the chemicals often wash off the narrow leaves of this plant making herbicide treatment difficult (Hackett and Monfils, 2014). Should herbicides be applied, mid-summer is the most ideal application time. An aquatically registered surfactant should be added to help the herbicide adhere to the plant. Prevention, early detection, and rapid response is the best management technique for flowering rush.

### 6.0 CONCLUSION

The Site is designed to operate passively with minimal O&M requirements. If more active management is desired, such as for extreme water levels or HABs, it is recommended to develop an active management plan for the Site. It is difficult to project future water levels so this potential future active management plan may provide detailed guidance to achieve the particular objectives desired.

FIGURES









### APPENDIX A

Site Inspection Form



### SITE INSPECTION FORM

Operation and Maintenance (O&M) Plan for Penn 7 Wetland Restoration

Entity: City of Toledo	Inspection Type: Annual/Other	Inspector:	Date://	
	mopoenen i yper <u>/ amoui/ Omer</u>		//	

The inspector shall complete entire Site Inspection Form, and return original copy to the Commissioner of the City of Toledo's Division of Parks, Recreation and Forestry. If unable to inspect an item, or cannot clearly conclude an answer, select no answer **(NA)**; and include reason for selection in comments/notes column. Use Figures 3 and 4 of O&M Plan for reference.

### YES = May Need Further Evaluation

### No = No Evaluation Needed

### PERIMETER FENCE AND GATES INSPECTION:

Inspection Item	Lee Portion (south/west):	Warrick Portion (north/east):	Comments/Notes:
Perimeter fence compromised?	□ NA □ YES □ NO	□ NA □ YES □ NO	
Excess gaps or holes in fence material?	🗌 NA 🗌 YES 🗌 NO	🗌 NA 🗌 YES 🗌 NO	
Damage to gates, locks, or fence posts?	🗌 NA 🗌 YES 🗌 NO	🗌 NA 🗌 YES 🗌 NO	
Gate locks inoperable or unlocked?	🗌 NA 🗌 YES 🗌 NO	🗌 NA 🗌 YES 🗌 NO	
Excess vegetative growth within fence or debris against fence?	🗌 NA 🗌 YES 🗌 NO	🗌 NA 🗌 YES 🗌 NO	
<b>Documentation</b> : If potential impacts to perimeter fence or gates, document location, take picture, provide information to Commissioner for evaluation. Commissioner will consult with an engineer, if needed. Excessive piling of debris shall be removed and relocated per Commissioner.			

### WATER CONTROL STRUCTURE (WCS) INSPECTION:

Inspection Item:	Wetland WCS:	Connecting Channel WCS:	Embayment WCS:	Comments/Notes:
Record Water Level				
Water seeping through stop logs?			🗋 NA 📋 YES 📋 NO	
Expositive debris (readiment within the				
WCS?				
Damage to the WCS or internal	🗌 NA 🗌 YES 🗌 NO	🗌 NA 🗌 YES 🗌 NO	🗌 NA 🗌 YES 🗌 NO	
components (stop logs, fish grate,				
Sloughing of revetment?	ΠΝΑ ΠΥΕΣ ΠΝΟ	ΠΝΑ ΠΥΕΣ ΠΝΟ	Π ΝΑ Π ΥΕΣ Π ΝΟ	
Erosion around or adjacent to the	🗌 NA 🗌 YES 🗌 NO	🗌 NA 🗌 YES 🗌 NO	🗌 NA 🗌 YES 🗌 NO	
WCS?				
Excessive piling of debris/sediment				
at outlets or trash racks?				
<b>Documentation:</b> If potential impacts to structural integrity of WCS, document location, take picture, provide information to Commissioner for evaluation. Commissioner				
at outlets or trash racks?  Documentation: If potential impacts to structural integrity of WCS, document location, take picture, provide information to Commissioner for evaluation. Commissioner will consult with an engineer, if needed. Excessive piling of debris/sediment shall be removed and relocated per Commissioner.				

### **DIKES/EMBANKMENT INSPECTION:**

Inspection Item:	Perimeter CDF Dike:	Channel Crossing:	Embayment Dike :	Comments/Notes:
Water seeping through the dike or embankments?	□ NA □ YES □ NO	🗌 NA 🗌 YES 🗌 NO	□ NA □ YES □ NO	
Portions of side slope eroded?	□ NA □ YES □ NO	🗌 NA 🗌 YES 🗌 NO	□ NA □ YES □ NO	
Portions of pathway settled?	□ NA □ YES □ NO	🗌 NA 🗌 YES 🗌 NO	□ NA □ YES □ NO	
Sloughing of revetment materials?	□ NA □ YES □ NO	🗌 NA 🗌 YES 🗌 NO	□ NA □ YES □ NO	
Excessive piling of debris/sediment on side slopes?	□ NA □ YES □ NO	🗌 NA 🗌 YES 🗌 NO		
<b>Documentation:</b> If potential impacts to dikes or embankments, document location, take picture, provide information to Commissioner for evaluation. Commissioner will consult with an engineer, if needed. Excessive piling of debris/sediment shall be removed and relocated per Commissioner.				

### CHANNEL/FOREBAY INSPECTION:

Inspection Item:	Channel:	Forebay:	Comments/Notes:
Excessive piling of debris?	🗌 NA 🗌 YES 🗌 NO		
Excessive piling of sediment?	🗋 na 📋 yes 📋 no		
Documentation: If potential flow restrictions or impacts to channel or forebay, document location, take picture, provide information to Commissioner for evaluation.			
Commissioner will consult with an engineer, if needed. Excessive piling of debris/sediment shall be removed and relocated per Commissioner.			

### **VEGETATION INSPECTION:**

Inspection Item:	Wetland:	Upland:	Embayment:	Comments/Notes:
Established vegetative growth unhealthy?	🗌 NA 🗌 YES 🗌 NO	🗌 NA 🗌 YES 🗌 NO	□ NA □ YES □ NO	
Invasive species present?	🗌 NA 🗌 YES 🗌 NO	🗌 NA 🗌 YES 🗌 NO	□ NA □ YES □ NO	
Damage to any trees or plants?	🗌 NA 🗌 YES 🗌 NO	🗌 NA 🗌 YES 🗌 NO	□ NA □ YES □ NO	
Trees or shrubs requiring maintenance?	🗌 NA 🗌 YES 🗌 NO	🗌 NA 🗌 YES 🗌 NO	□ NA □ YES □ NO	
List invasive species observed:				
Documentation: If vegetation concerns are present, document location, take picture, provide information to Commissioner for evaluation. Commissioner will consult with an ecologist, if needed.				

General Notes/Comments (indicate if additiona	sheets were required for notes):	
Summary of Potential Action Items (indicate if a	additional sheets were required):	
Inspection Completed By:	Date:	
Inspection Report Reviewer Verification:		
Commissioner	or Designated Employer/Agent	

### APPENDIX B

Water Control Structure Photo Pages



PHOTO 1: Overview of the Wetland Water Control Structure (WCS).



PHOTO 2: Overview of the Channel WCS.



Penn 7 Operations and Maintenance Plan City of Toledo Water Control Structure Photographs

> 3300 N Summit Street R Toledo, Lucas County, Ohio

### June 2022

Project Number: COT303 File Name: COT303.0020.XLS

Date:



PHOTO 3: Overview of Open Water Embayment WCS.







Penn 7 Operations and Maintenance Plan City of Toledo

Site Photographs

3300 N Summit Street R Toledo, Lucas County, Ohio June 2022

Project Number: COT303 File Name:

Date:

COT303.0020.XLS



PHOTO 5: Interior of the Wetland WCS showing, from left to right, the staff gauge, stop log guides, steps, and fish grate.



### PHOTO 6: Removal of stop log from the Wetland WCS using lifting hooks.



Penn 7 Operations and Maintenance Plan City of Toledo Site Photographs

> 3300 N Summit Street R Toledo, Lucas County, Ohio

June 2022 Project Number: COT303 File Name:

Date:

COT303.0020.XLS

### APPENDIX C

As-Built Planting Plan



LOCATION MAP

# CONSTRUCTION DRAWINGS FOR: PENN 7 EMERGENT COASTAL FLOODPLAIN WETLANDS RESTORATION PROJECT

**CITY OF TOLEDO** LUCAS COUNTY, OHIO





THE LOCATIONS OF UNDERGROUND UTILITIES SHOWN HEREON ARE BASED ON ABOVE GROUND STRUCTURES AND RECORD DRAWINGS PROVIDED TO THE SURVEYOR. LOCATIONS OF UNDERGROUND UTILITIES/STRUCTURES MAY VARY FROM LOCATIONS SHOWN HEREON. ADDITIONAL BURIED UTILITIES/STRUCTURES MAY BE ENCOUNTERED. NO EXCAVATIONS WERE MADE DURING THE PROGRESS OF THIS SURVEY TO LOCATE BURIED UTILITIES/STRUCTURE

TOPOGRAPHIC SURVEY PERFORMED BY: GARCIA SURVEYORS, INC DATE OF FIELD WORK: 06-13-2016 AND 01-06-2020 EVERY DOCUMENT OF RECORD REVIEWED AND CONSIDERED AS A PART OF THIS SURVEY IS NOTED HEREO

BATHYMETRIC SURVEY PERFORMED BY. JOBES HENDERSO DATE OF FIELD WORK: 05-19-2016

EVERY DOCUMENT OF RECORD REVIEW AND CONSIDERED AS PART OF THIS SURVEY IS NOTED HEREON

ELECTRONIC TOPOGRAPHIC AND BATHYMETRIC SURVEYS ARE AVAILABLE UPON REQUEST

ALL ELEVATIONS ARE IN FEET AND REFER TO THE INTERNATIONAL GREAT LAKES DATUM OF 1985 (IGL085). ORDINARY HIGH WATER MARK (OHWM) IS 573.40. ANTICIPATED AVERAGE LAKE LEVEL RANGE IS 570.00 TO 573.00.

#### BASIS OF BEARINGS:

HEREIN ARE BASED ON OHIO STATE PLANE COORDINATE SYSTEM, NORTH SYSTEM, NAD83, GEOID12A

BENCHMARKS

AS PER THE TOPOGRAPHIC SURVEY PREPARED BY GARCIA SURVEYORS, INC. THE CONTRACTOR AND/OR HIS SURVEYOR SHALL BE RESPONSIBLE TO CROSS CHECK ALL CONTROL FOR DISTURBANCE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.

#### FLOODZONE INFORMATION

THE SITE IS LOCATED IN ZONE A , AREAS DETERMINED TO BE WITHIN 1% ANNUAL CHANCE FLOOD (100-YEAR FLOOD), BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY ON FLOOD INSURANCE RATE MAP, MAP NO 39095C0115E, WITH AN EFFECTIVE DATE OF AUGUST 6, 2011 IN LUCAS COUNTY, OHIO

#### PRE-CONSTRUCTION NOTICE

THESE PLANS HAVE BEEN PREPARED USING THE MOST ACCURATE INFORMATION AND DATA AVAILABLE AT THE TIME OF PREPARATION. FIELD CONDITIONS MAY BE ENCOUNTERED DURING CONSTRUCTION WHICH VARY FROM THOSE DEPICTED HEREIN. MODIFICATIONS TO THE DESIGN AS SHOWN MAY BE REQUIRED BASED ON FIELD CONDITIONS AT THE TIME OF CONSTRUCTION, IN ANY EVENT, THE ENGINEERING OBJECTIVES OF THE DESIGN SHALL BE MET. IF FIELD CONDITIONS ARE ENCOUNTERED PRIOR TO CONSTRUCTION OR DURING CONSTRUCTION THAT DIFFER SIGNIFICANITY FROM THE CONDITIONS SHOWN ON THE PLANS, THE CONTRACTOR MUST STOP WORK AND NOTIFY THE OWNER AND ENGINEER IMMEDIATELY.

Mesic to Dry Mix - Area's disturbed by constniction, not on plan



ODOT Roadside MIX - Area's disturbed by Construction, not on plan

#### SHEET INDEX

SHEET TITLE	SHEET NO
ÍTLE	C1.0
SENERAL NOTES	C2.0
EGEND	C3.0
OPOGRAPHIC SURVEY	C4.0
XISTING ENVIRONMENTAL CONDITIONS	C4.1
OVERALL SITE PLAN	C5.0
RADING PLAN	C6.0
RADING PLAN	C6.1
ECTIONS	C6.2
IKE & REVETMENT DETAIL	C7.0
VATER CONTROL STRUCTURE DETAILS	C7.1
VATER CONTROL STRUCTURE DETAILS	C7.2
MBAYMENT DETAILS	C7.3
ROSION & SEDIMENT CONTROL PLAN	C8.0
ROSION & SEDIMENT CONTROL PLAN	C8.1
ROSION & SEDIMENT CONTROL NOTES	C8.2
ROSION & SEDIMENT CONTROL DETAILS	C8.3
LANTING PLAN	C9.0
LANTING PLAN	C9.1
LANTING NOTES & TABLES	C9.2
LANTING NOTES & DETAILS	C9.3
WASIVE SPECIES CONTROL NOTES	C9.4





Sheet Number:

1 OF 22

C10









HULL Environment / Energy / Infrastructure

Hull & Associates, Inc. Phone: (419) 365-2018 218 S. Eris Street Fax: (419) 243-1881 Telado, CH 43604 www.hullinc.com

erine Takat

Mapleo

vofessional Seat:

Project Tille:

Sheet Hemb

19 OF 22

C9.1

#### SEEDING AND MULCHING

SEEDING AND MULCHING SHALL BE PERFORMED WITHIN THE APPLICATION TIME FRAMES SPECIFIED IN ODNR RAINWATER AND LAND DEVELOPMENT MANUAL. SEED SCHEDULE SHALL BE AS FOLLOWS:

PERMANENT SEEDING EROSION CONTROL MIXTURE: REFER TO THE TABLES ON THIS SHEET AND THE PLANTING PLAN ON SHEET C9.2

TEMPORARY EROSION CONTROL MIXTURE: MARCH 1 TO AUGUST 15 OATS: 60% OF WEIGHT CANADIAN WILDRYE: 20% OF WEIGHT VIRGINIA WILDRYE: 20% OF WEIGHT APPLICATION RATE: 5 lbs. PER 1,000 SQ. FT.

AUGUST 16 TO NOVEMBER 1 CEREAL RYEGRASS: 60% OF WEIGHT CANADIAN WILDRYE: 20% OF WEIGHT VIRGINIA WILDRYE: 20% OF WEIGHT APPLICATION RATE: 5 LBS. PER 1,000 SQ. FT.

NOVEMBER 2 TO FEBRUARY 28 USE MULCH ONLY OR PERMANENT SEEDING

- 2. PERFORM THIS WORK IN ALL AREAS OF SOIL DISTURBANCE THAT WILL NOT HAVE SOME OTHER TYPE OF PERMANENT EROSION CONTROL BARRIER AS SHOWN ON THE PLANS (E.G., GRAVEL COVER, PAVEMENT, ETC.).
- 3. PERFORM THIS WORK IN THE TIMEFRAMES IDENTIFIED IN THE SWPPP AND WITHIN 7 DAYS OF OBTAINING FINAL GRADE. IF IT IS ANTICIPATED THAT FUTURE WORK MAY DISTURB AN AREA, PLACE TEMPORARY SEED AND MULCH.
- 4. MULCHING MATERIAL SHALL BE APPLIED AT A RATE OF 90 lbs. PER 2 TONSIACRE. MULCHING SHALL CONSIST OF OAT OR WHEAT STRAW, HAY OR WOOD FIBER FREE FROM WEEDS AND FOREIGN MATTER DETRIMENTAL TO PLANT LIFE. TACKIFIER SHALL BE APPLIED TO WOOD MULCH. TACKIFIER APPLICATION RATE 3 LBS PER ACRE LAND TACK SCE-TAK OR ENGINEER APPROVED EQUAL. FOR AREAS LESS STEEP THAN 4:1 SLOPE, DIRECT DRILL OF SEEDS WITHOUT MULCH IS ACCEPTABLE AS LONG AS THE CONTRACTOR ENSURES THE SITE REACHES FINAL STABILIZATION
- APPLY WATER IN ACCORDANCE WITH ODOT ITEM 659. WATER SHALL BE CLEAN, FRESH AND FREE OF SUBSTANCES OR MATTER WHICH COULD INHIBIT VIGOROUS GROWTH OF GRASS.
- 6. SEEDED AREAS SHALL BE MAINTAINED BY THE CONTRACTOR UNTIL THE SITE REACHES FINAL STABILIZATION FINAL SEEDED AREAS 317412 DE MAINTAINED DE THE COMMON TO WITH THE SITE REAVERES FINAL STABILIZATION. FINAL STABILIZATION MEANS THE VEGETATION HAS ESTABLISHED UNIFORM PERENNILL VEGETATUE COVER (E.G., EVENL) DISTRIBUTED, WITHOUT LARGE BARE AREAS) WITH A DENSITY OF AT LEAST 70 PERCENT VEGETATUE COVER FOR A PERIOD OF 1 YEAR FROM THE TIME OF PLANTING. IN ADDITION, ALL TEMPORARY ERGOSION AND SEDIMENT CONTROL PRACTICES ARE REMOVED AND DISPOSED OF AND ALL TRAPPED SEDIMENT IS PERMANENTLY STABILIZED TO PREVENT FURTHER ERGOSION. CONTRACTOR SHALL WATER TO PREVENT GRASS AND SOIL FROM DRYING OUT.
- SEEDED AREAS THAT DO NOT HAVE A UNIFORM DENSITY OF AT LEAST 70 PERCENT VEGETATIVE COVER, SHALL BE REPAIR SEEDED OR INTER-SEEDED AND MULCHED. COMPOST MAY NOT BE USED TO REPAIR AREAS.

#### GENERAL PLANTING NOTES

#### PLANTING PROCEDURE

- 1. THIS WORK SHALL BE DONE IN CONFORMANCE WITH THE REQUIREMENTS OF ODOT CMS 661. PLANTS SHALL BE PLANTED CAREFULLY AND FIRMLY IN PLACE AT THE SPECIFIED PLANTING DENSITIES TO THE MINIMUM DEPTH NECESSARY TO ANCHOR THEM IN THE SOIL
- 2. REFER TO THIS SHEET FOR PLANTING SCHEDULES.

#### PLANTING MAINTENANCE

1. DURING THE LIFE OF THE CONTRACT AND PERIOD OF ESTABLISHMENT, THE CONTRACTOR WILL BE RESPONSIBLE TO MAINTAIN THE PLANTED AREAS AND KEEP THIS AREA FREE FROM WEEDS AND DEBRIS.

#### INSPECTIONS

- PERIODIC INSPECTIONS OF THE PLANTING AREA SHALL OCCUR ON A MONTHLY BASIS DURING THE PERIOD OF 1 ESTABLISHMENT TO ENSURE THAT THE SITE IS BEING MAINTAINED AS SPECIFIED. THE CONTRACTOR IS RESPONSIBLE TO MAKE ARRANGEMENTS WITH THE ENGINEER TO ESTABLISH A SCHEDULE FOR THESE INSPECTIONS.
- THE PERIOD OF ESTABLISHMENT WILL BE AS SPECIFIED IN THE 2010 ODOT CMS 661.17. 2.
- THE NUMBER OF PERENNIALS, AS PER PLAN OF EACH SPECIES AND SIZE WILL BE THOSE PLANTED, COMPLETE IN PLACE AND 3. ACCEPTED

	AREA 1 - WETLAND/WATERWAY RIPARIAN SLOPE STABILIZATI
Щ_Ш===	AREA 2 - FORESTED WETLAND RESTORATION
	AREA 3 - EMERGENT WETLAND RESTORATION
	AREA 4 - SUBMERGED AQUATIC VEGETATION RESTORATION
<i>% % % % % % </i>	AREA 5 - MESIC TO DRY UPLAND

DUETI AND DEGTODATION AND	NUMBER OF A	ND ENEDOEN		PLANII	NG AREA
D WEILAND RESIDRATION AND E	NHANCEMENIA	ND EMERGEN	IT WETLAND	AREA 2	AREA 3
T				ACRES: 3.0	ACRES: 2.2
COMMON NAME	INDICATOR STATUS*	DENSITY	LBS PER ACRE	QUANTITY (LBS)	QUANTITY (LBS)
Fox Sedge	OBL	33.2%	6.64	19.8	14.7
Virginia Wildrye	FACW	20.0%	4	11.9	8.9
Blunt Broom Sedge	FACW	9.2%	1.84	5.5	4.1
Lurid Sedge	OBL	8.0%	1.6	4.8	3.5
Hop Sedge	OBL	8.0%	1.6	4.8	3.5
Blue Vervain	FACW	4.0%	0.8	2.4	1.8
Soft Rush	OBL	3.0%	0.6	1.8	1.3
Swamp Milkweed	OBL	3.0%	0.6	1.8	1.3
Wood Reedgrass	FACW	3.0%	0.6	1.8	1.3
Flat-Topped White Aster	FACW	2.4%	0.48	1.4	1.1
Oxeye Sunflower	FACU	2.0%	0.4	1.2	0.9
	D WETLAND RESTORATION AND E T COMMON NAME Fox Sedge Virginia Wildrye Blunt Broom Sedge Lurid Sedge Hop Sedge Blue Vervain Soft Rush Swamp Milkweed Wood Reedgrass Fiat-Topped White Aster Oxeye Sunflower	D WETLAND RESTORATION AND ENHANCEMENT A T COMMON NAME Fox Sedge OBL Virginia Widrye FACW Blunt Broom Sedge FACW Lurid Sedge OBL Hop Sedge OBL Blue Vervain FACW Soft Rush OBL Swamp Milkweed OBL Swamp Milkweed OBL Wood Reedgrass FACW Flat-Topped White Aster FACW Oxeys Sunflower FACU	D WETLAND RESTORATION AND ENHANCEMENT AND EMERGEN T COMMON NAME Fox Sedge OBL 33.2% Virginia Widrye Blunt Broom Sedge FACW 20.0% Blunt Broom Sedge OBL 8.0% Hop Sedge OBL 8.0% Hop Sedge OBL 8.0% Soft Rush OBL 3.0% Swamp Milkweed OBL 3.0% Swamp Milkweed OBL 3.0% Swamp Milkweed OBL 3.0% Swamp Milkweed OBL 3.0%	D WETLAND RESTORATION AND ENHANCEMENT AND EMERGENT WETLAND T COMMON NAME INDICATOR STATUS* DENSITY LBS PER ACRE Fox Sedge OBL 33.2% 6.64 Virginia Wildrye FACW 20.0% 4 Blunt Broom Sedge FACW 9.2% 1.84 Lurid Sedge OBL 8.0% 1.6 Blue Vervain FACW 4.0% 0.8 Soft Rush OBL 8.0% 0.6 Swamp Milkweed OBL 3.0% 0.6 Swamp Milkweed OBL 3.0% 0.6 Flat-Topped White Aster FACW 2.4% 0.48 Oxeys Sunflower FACU 2.0% 0.4	D WETLAND RESTORATION AND ENHANCEMENT AND EMERGENT WETLAND         PLANIII           T         COMMON NAME         INDICATOR STATUS*         DENSITY         LBS PER ACRE         QUANTITY (LBS)           Fox Sedge         OBL         33.2%         6.64         19.8           Virginia Wildrye         FACW         20.0%         4         11.9           Blunt Broom Sedge         FACW         9.2%         1.84         5.5           Lurid Sedge         OBL         8.0%         1.6         4.8           Blue Vervain         FACW         4.0%         0.8         2.4           Sort Rush         OBL         3.0%         0.6         1.8           Wood Reedgrass         FACW         3.0%         0.6         1.8           Wood Reedgrass         FACW         2.0%         0.6         1.8           Wood Reedgrass         FACW         2.0%         0.6         1.8           Virgina Wilk Aster         FACW         2.0%         0.4         1.4

1.0%

1.0%

0.6%

0.2

0.2

0.12

0.6

0.6

0.4

0.4

04

0.3

0.2

0.2

0.2 0.0 44.4

FACW

FACW

OBL

Alisma subcordatum	Water Plantain	OBL	0.5%	0.1	0.3
Lobelia siphilitica	Great Blue Lobelia	FACW	0.5%	0.1	0.3
Scirpus cyperinus	Woolgrass	OBL	0.5%	0.1	0.3
Chelone glabra	Turtlehead	OBL	0.1%	0.02	0.1
		TOTAL:	100.0%	20	59.6
* Wetland indicator status based	on Northcentral and Northeast USDA an	d USACE subregion	n.		
- Seed mixed based on ERNST	Seed mix for wet meadows and wetland	ds (ERNMX-122).			
- Substitutions may be made ba	ad upon availability and coordination w	ith angineer			

- Subs - Round total quantity up to nearest pound for estimating and purchasing purposes.

Common Sneeze

Roneset

Ditch Ston

Helenium autumnale

Penthorum sedoides

Eupatorium perfoliatum

					PLANTING
TABLE 2: SEED MIX FOR MESIC TO	D DRY UPLAND AREA DISTURBED	BY CONSTRUCTION	N		AREA 5
					ACRES:
					6.0
SCIENTIFIC NAME	COMMON NAME	INDICATOR	DENSITY	LBS PER	QUANTITY
		STATUS*		ACRE	(LBS)
Schizachyrium scoparium	Little Bluestem	FACU	27.5%	5.50	32.9
Elymus virginicus	Virginia Wildrye	FACW	20%	4.00	23.9
Sorghastrum nutans	Indiangrass	FAC	15%	3.00	17.9
Tridens flavus	Purpletop	UPL	5%	1.00	6.0
Verbena hastata	Blue Vervain	FACW	5%	1.00	6.0
Panicum clandestinum	Deertongue	FACW	5%	1.00	6.0
Coreopsis lanceolata	Lanceleaf Coreopsis	FACU	4%	0.80	4.8
Rudbeckia hirta	Blackeye Susan	FACU	3%	0.60	3.6
Echinacea purpurea	Purple Coneflower	FACU	3%	0.60	3.6
Chamaecrista fasciculata	Partridge Pea	FACU	3%	0.60	3.6
Heliopsis helianthoides	Smooth Oxeye	FACU	2%	0.40	2.4
Liatris spicata	Marsh Blazing Star	FAC	1.6%	0.32	1.9
Zizia aurea	Golden Alexanders	FAC	1%	0.20	1.2
Asclepias incarnata	Swamp Milkweed	OBL	1%	0.20	1.2
Symphyotrichum laeve	Smoth Blue Aster	FACU	0.7%	0.14	0.8
Senna marilandica	Maryland Senna	FACW	0.5%	0.10	0.6
Baptisia australis	Blue False Indigo	FACU	0.5%	0.10	0.6
Eupatorium perfoliatum	Boneset	FACW	0.50%	0.10	0.6
Geum canadense	White Avens	FAC	0.5%	0.10	0.6
Monarda fistulosa	Wild Bergamont	FACU	0.4%	0.08	0.5
Lespedeza capitata	Roundhead Lespedeza	FACU	0.3%	0.06	0.4
Asclepias syriaca	Common Milkweed	UPL	0.3%	0.06	0.4
Solidago juncea	Early Goldenrod	n/a	0.2%	0.04	0.2
		TOTAL:	100%	20	119.6

\* Wetland indicator status based on Northcentral and Northeast USDA and USACE subregion - Substitutions may be made based upon availability and coordination with engineer. - Seed mixed based on ERNST Seed mix for wet meadows and wetlands (ERNMX-105). - Round total quantity up to nearest pound for estimating and purchasing purposes.

TABLE 3: SEED MIX FOR WET	LAND/WATERWAY RIPARIAN SLO	PE STABILIZATION			PLANTING ARE AREA 1 ACRES:
SCIENTIFIC NAME	COMMON NAME	INDICATOR STATUS*	DENSITY	L8S PER ACRE	1.4 QUANTITY (LBS)
Elymus riparius	Riverbank Wildrye	FACW	32.0%	6.4	8.9
Elymus virginicus	Virginia Wildrye	FACW	32.0%	6.4	8.9
Elymus hystrix	Bottlebrush Grass	FACU	18.0%	3.6	5.0
Elymus villosus	Silky Wildrye	FACU	18.0%	3.6	5.0
		TOTAL:	100.0%	20	27.7

\* Wetland indicator status based on Northcentral and Northeast USDA and USACE subregion - Substitutions may be made based upon availability and coordination with engineer - Round total quantity up to nearest pound for estimating and purchasing purposes.

					1.000				S STORES		
					PLA	TING AREA		E	nvironm	ent / Energy /	Infrastructure
TAB	LE 4: WOODY STEM PLAN	TING FOR FORESTE	ED WETLA	ID HABITAT		ACRES		Hu	11 & Assoc	iates, Inc. Ph	ine: (419) 385-2018
	T			INDICATOR	۲ C	UANTITY		21 To	9 S. Erie ledo, OH 4	Street Fa 13604 war	.hullinc.com
	SCIENTIFIC NAME	COMMON	NAME	STATUS*	1	STEMS <sup>†</sup> )		Pr	ofessional	Sed:	
	Acer rubrum	Red Maple		FAC		30				100000000000000000000000000000000000000	
CANOP	Acer saccharinum	Black Willow		OBL		30				and and	A CONTRACTOR
TREES	Platanus occidentalis	American Syca	more	FACW		30			1	PEP	1.1
	Quercus bicolor	Swamp White (	Dak	FACW		30			1	t and a	Real Provide P
	Amnia melanogama	Black chokaba	rn/	TOTA	<u>+L: </u>	30			1	11 13623	M
	Cephalanthus occidenta	lis Buttonbush	ily	FACW		30				XALLE	Al.
SHRUB	Cornus amomum	Silky dogwood		FACW		30			4	Property and	har a
	Cornus sericea	Red-osier dogy	wood	FAC		30				31	IGARD
	Sambucus canadensis	Elderberry		TOTA	M ·	150		Pr	niect Title	:	
* Wetlan <sup>†</sup> Canopy - Quanti - Substit - No sing be rando	d indicator status based on i trees shall be 1-inch calipen y based on 100 stems/acre utions may be made based ple species may comprise m mly planted throughout resp	Northcentral and North s and shrubs shall be l upon availability and o ore than 40% of habit ective habitat areas.	heast USDA bareroot 2-y coordination at, trees an	, and USACE s ear seedlings, with engineer d shrubs should	subregion. d					WETLANDS	
					PLA	NTING AREA			NGS	PLAIN	0
TABLE	5: WOODY STEM PLANTI	NG FOR MESIC TO I	DRY FORE	STED UPLAND	) <del> </del>	ACRES			M	БЩ	٥Ĕ
	1		×	INDICATO		6.0 UANTITY			R	ЯŠ	ы с
	SCIENTIFIC NAME	COMMON	NAME	STATUS*		STEMS <sup>†</sup> )			b	권법	ゴ다
	Quercus rubra	Red Oak	1	FACU		48			N	N L	2 N
CANOPY	Quercus alba	White Oak		FACU		48			Ĕ	ĔĔ	ЧÖ
TREES	Linodendron tulipitera	Burr Oak		FACU		48			2	AA	200
	Juglans nigra	Black Walnut		FACU		48			R	Sp	ΗŇ
				TOTA	AL:	240			ST	ST	0 9
	Amelanchier arborea	Common Servi	ceberry	FACU		48			ð		
SHRUBS	Corylus americana	Hazelnut		FACU		48			Ö	ŝ	
	Crataegus mollis	Hawthorn		FACU		48		4		Щ	
* Wetlan Canopy - Quantii	Crataegus mollis Viburnum prunifolium d indicator status based on i trees shall be 1-inch calipen y based on 80 stems/acre	Hawthorn Blackhaw S Northcentral and North s and shrubs shall be	neast USDA bareroot 2-y	FACU FACU TOTA and USACE s ear seedlings.	AL: subregion.	48 48 240	1000000	þ		PENN 7 EME	
* Wetlan Canopy - Quantii - Substit - No sing hrougho	Crataegus mollis Viburnum prunifolium d indicator status based on l trees shall be 1-inch calipen y based on 80 stems/acre utions may be made based le species may comprise m it respective habitat areas.	Hawthorn Blackhaw S Northcentral and North s and shrubs shall be l upon availability and c ore than 40% of habit	neast USDA bareroot 2-y coordination cat, trees an	FACU FACU TOTA and USACE s ear seedlings. with engineer d shrubs should	AL: subregion. d be rando	48 48 240 mly planted	1000000	4	Nemer:	PENN 7 EME	
* Wetlan Canopy - Quantii - Substit - No sing hroughou	Cratagus mollis Viburnum prunifolium d indicator status based on I trees shall be 1-inch calipers y based on 80 stems/acre utions may be made based le species may comprise m ut respective habitat areas. TABLE 6: LIVE STAKE PI RIPARIAN	Hawthorm Blackhaw S Northcentral and North s and shrubs shall be l upon availability and c ore than 40% of habit LANTING FOR WETL SLOPE STABILIZATI	AND/WATE	FACU FACU TOTA and USACE s ear seedlings. with engineer d shrubs should	AL: subregion. d be rando PLANTIN ARE ACR	48 48 240 mly planted G AREA A 1 ES:	r rowwood	<b>4</b>	Awmer:	DELETERSOL	AVENUE.
* Wetlan Canopy - Quantii - Substit - No sing hroughor	Crategus mollis Viburnum prunifolium di indicator status based on l trees shall be 1-inch calipen y based on 80 stems/acre titons may be made based le species may comprise m it respective habitat areas. TABLE 6: LIVE STAKE PI RIPARIAN SCIENTIFIC NAME	Hawthorn Blackhaw Northcentral and North s and shrubs shall be l upon availability and d ore than 40% of habit LANTING FOR WETL SLOPE STABILIZATI	AND/WATE	FACU FACU TOTA and USACE sear seedlings. with engineer d shrubs should	d be rando PLANTIN ARE ACR 1. QUAN (STAF	48 48 240 mly planted G AREA A1 ES: 4 TITY (ES)	r rowwood	<b>4</b>	Demer: 600	D JEFFERSON SUITE 3 TOLEDO, 07	AVENUE, 00 1 43604
* Wetlan Canopy - Quantii - Substit - No sing hroughou	Crategus mollis Viburnum prunifolium d indicator status based on l trees shall be 1-inch calipen y based on 80 stems/acre titons may be made based le species may comprise m it respective habitat areas. TABLE 6: LIVE STAKE PI RIPARIAN SCIENTIFIC NAME ix discolor	Hawthorn Blackhaw Northcentral and North s and shrubs shall be l upon availability and d ore than 40% of habit core than 40% of habit LANTING FOR WETL SLOPE STABILIZATI COMMON NAM Pussy Willow	AND/WATE	FACU FACU TOTA and USACE sear seedlings. with engineer d shrubs should RWAY	AL: subregion. d be rando PLANTIN ARE ACR 1 QUAN (STAF 122	48 48 240 mly planted G AREA A1 ES: 4 TITY ES: 10	r rowwood	<b>4</b>	Armer: 600	D JEFFERSON SUITE 3 TOLEDO, 04	AVENUE, 00 1 43604
* Wetlan Canopy - Quantii - Substit - No sing throughout Sal	Cratagus mollis Viburnum prunifolium d indicator status based on l trees shall be 1-inch calipen y based on 80 stems/acre titons may be made based le species may comprise m it respective habitat areas. TABLE 6: LIVE STAKE PI RIPARIAN SCIENTIFIC NAME ix discolor ix interior/exigua	Hawthorn Blackhaw Northcentral and North s and shrubs shall be l upon availability and d ore than 40% of habit core than 40% of habit LANTING FOR WETL SLOPE STABILIZATI COMMON NAM Pussy Willow Sandbar Willow	AND/WATE	FACU FACU TOTA and USACE sear seedlings. with engineer d shrubs should RWAY	AL: subregion. d be rando PLANTIN ARE ACR 1. QUAN (STAF 122 122 244	48 48 240 mly planted G AREA A 1 ES: 4 TITY (ES) 10 10	r rowwood	<b>k</b>	Nemer: 600 This dr	ULEFFERSOI SUITES TOLEDO, OF	AVENUE, 00 1 43604 and is the sole of base inc
* Wetlan Canopy - Quantii - Substit - No sing - No sing - No sing - No sing - Sal -	Cratagus mollis Viburnum prunifolium di ndicator status based on l trees shall be 1-inch caliper y based on 80 stems/acre utions may be made based le species may comprise m it respective habitat areas. TABLE 6: LIVE STAKE PI RIPARIAN SCIENTIFIC NAME ix discolor ix Interior/exigua /etland indicator status base ubstitutions may be made to pace live stakes 5-foot on co	Hawthorm Blackhaw S Northcentral and North s and shrubs shall be l upon availability and one than 40% of habit LANTING FOR WETL SLOPE STABILIZATI COMMON NAM Pussy Willow Sandbar Willow d on Northcentral and Is/acre wased upon availability enter	AND/WATE AND/WATE Northeast and coordin	FACU FACU TOTA and USACE sear seedlings. with engineer d shrubs should random seedlings. RWAY DICATOR STATUS* FACW FACW FACW TOTAL: JSDA and USA	AL: subregion. d be rando PLANTIN ARE ACR 1. QUAN (STAF 122 122 122 122 122 122 122 122 122 12	48 48 240 mly planted 3 AREA A1 ES: 4 TITY 4ES) 10 10 10 10 10 10 10 10	r <i>towwoo</i>	4	Amer: 60( This dri This dri Th	A NUBA D JEFFERSON SUITE 3 TOLEDO, OF awing is copyrigh property Hull & Associa- to dear of the last second reliable as a fighter ere copyright	AVENUE, 00 1 43604 ad and is the sole of the project covers of the
* Wetlan Canopy - Quantii - Substit - Substit - No sing hrougho - No sing - Sal - Sal - S - S - S	Cratagus mollis Viburnum prunifolium d indicator status based on 1 trees shall be 1-inch calipers y based on 80 stems/acre utions may be made based le species may comprise m at respective habitat areas. TABLE 6: LIVE STAKE PI RIPARIAN SCIENTIFIC NAME ix discolor Ix Interlor/exigua /etland indicator status base ubstitutions may be made to pace live stakes 5-foot on co	Hawthorm Blackhaw S Northcentral and North s and shrubs shall be l upon availability and c ore than 40% of habit LANTING FOR WETL SLOPE STABILIZATI COMMON NAM Pussy Willow Sandbar Willow d on Northcentral and skacre usaed upon availability enter	AND/WATE	FACU FACU TOTA and USACEs ear seedings. with engineer d shrubs should shrubs should iRWAY DICATOR STATUS' FACW TOTAL: USDA and US/ hation with engineer	AL: subregion. d be rando PLANTIN ARE ACR 127 127 244 ACE subregineer	48 48 240 mly planted G AREA A 1 ES: 4 TITY (ES) 10 10 10 10 10 10 10 10 10 10		<b>A</b>	Amer: 60( This dri Reproduc perm stork D -	UNUE CONVICTOR	AVENUE, 00 143604 ad and is the sole of the project owner the project owner the project owner the drawng or the method of the drawn of the sole of the drawn of t
* Wetlan Canopy - Quantil - Substit - Substit - No sing hrougho - No sing - Sal - Sal - S - S - S - S	Cratagus mollis Viburnum prunifolium d indicator status based on 1 trees shall be 1-inch calipers y based on 80 stems/acre utions may be made based le species may comprise m at respective habitat areas. TABLE 6: LIVE STAKE PI RIPARIAN SCIENTIFIC NAME ix discolor Ix Interior/exigua /etland indicator status base ubatitutions may be made to pace live stakes 5-foot on co	Hawthorm Blackhaw S Northcentral and North s and shrubs shall be l upon availability and c ore than 40% of habit LANTING FOR WETL SLOPE STABILIZATI COMMON NAM Pussy Willow Sandbar Willow d on Northcentral and Is/acre ased upon availability enter	AND/WATE AND/WATE Northeast and coordin	FACU FACU TOTA and USACEs ear seedings. with engineer d shrubs should shrubs should RWAY DICATOR STATUS' FACW TOTAL: USDA and USA hation with engineer	AL: subregion. d be rando PLANTIN ARE ACR 127 127 127 244 ACE subregineer	48 48 240 mly planted G AREA A 1 ES: 4 TITY (ES) 10 10 10 10 10 10 10 10 10 10	NG AREA 4 ACRES:	<b>k</b>	Amer: 600 This dra Reproduc perm perm serv perm perm perm perm perm perm perm perm	UNCETURAL DESC	AVENUE, 00 143604 ead and is the sole of the project owner to the drawing or the n without the written they prohibited erved erved n 10/29/1 N (303) 11/12/1
* Wetlan Canopy - Quantii - Substit - No sinç - No sinç - No sinç - Sal - Sal - S - S - S - S - S - S - S - S	Cratagus mollis Viburnum prunifolium d indicator status based on l trees shall be 1-inch calipers y based on 80 stems/acre utions may be made based lie species may comprise m at respective habitat areas. TABLE 6: LIVE STAKE PI RIPARIAN SCIENTIFIC NAME ix discolor ix Interior/exigua /etland indicator status base uantity based on 1742 ster ubstitutions may be made to pace live stakes 5-foot on c	Hawthorm Blackhaw S Northcentral and North s and shrubs shall be l upon availability and c ore than 40% of habit LANTING FOR WETL SLOPE STABILIZATI COMMON NAN Pussy Willow Sandbar Willow d on Northcentral and Is/acre ased upon availability enter	AND/WATE AND/WATE AND/WATE AND/WATE Northeast and coordin	FACU FACU TOTA and USACEs ear seedings. with engineer d shrubs should rubs should rubs should rubs should rubs should rubs for the fact TotAL: JSDA and USA aution with engineer totok for PO	AL: subregion. d be rando PLANTIN ARE ACR 12. 122 122 244 ACE subres ineer	48 48 240 mly planted 3 AREA A 1 ES: 4 TITY (ES) 10 10 10 10 10 10 10 10 10 10	NG AREA 4 ACRES: 0.62		Amer: 600 This dr Reproduce perm work D Perm Perm C P P	UNANCE OF CONTROL OF C	A AVENUE, 00 1 43604 ad and is the sole of the graving or but is but drawing or but drawing or but drawing or but is but drawing or but drawing or but drawing or but drawing or but is but drawing or but drawing ore
* Wetlan Canopy - Quantii - Substit - No sing - No sing - No sing - Sal - Sal	Crategus mollis Viburnum prunifolium d indicator status based on 1 trees shall be 1-inch calipen y based on 80 stems/acre utions may be made based le species may comprise m it respective habitat areas. TABLE 6: LIVE STAKE PI RIPARIAN SCIENTIFIC NAME ix discofor Ix Interior/ex/gua /etland indicator status base uantity based on 1742 stem ubstitutions may be made t pace live stakes 5-foot on co	Hawthorn Blackhaw S Northcentral and North s and shrubs shall be l upon availability and c ore than 40% of habit LANTING FOR WETL SLOPE STABILIZATI COMMON NAN Pussy Willow COMMON NAN Pussy Willow d on Northcentral and Is/acre ased upon availability enter	AND/WATE AND/WATE AND/WATE Northeast and coordin IC VEGETA	FACU FACU TOTA and USACEs ear seedings. with engineer d shrubs should shrubs should iRWAY DICATOR STATUS' FACW TOTAL: USDA and USA aution with engineer to the second state of the second status' FACW TOTAL: USDA and USA	AL: subregion. d be rando PLANTIN ARE ACR 12: 12: 12: 244 ACE subres ineer	48 48 240 mly planted 3 AREA A 1 ES: 4 TITY (ES) 10 10 10 10 10 10 10 10 10 10	NG AREA 4 ACRES: 0.62 EMBAYMENT QUANTITY (LBS)		This dra It is protu- informatic work D P F C C C C C C C C C C C C C	L NNAL C NNAL	AVENUE, 00 1 43604 ed and is the sole of the grogest owner, the groupst owner,
* Wetlan t Canopy - Quantii - Substit - No sing - No sing - No sing - Salt - S	Crategus mollis Viburnum prunifolium d indicator status based on 1 trees shall be 1-inch calipen y based on 80 stems/acre titons may be made based le species may comprise m it respective habitat areas. TABLE 6: LIVE STAKE PI RIPARIAN SCIENTIFIC NAME ix discolor Ix Interior/exigua /etland indicator status base uantity based on 1742 stem ubstitutions may be made to pace live stakes 5-foot on co UABLOK) FOR AREA 4 - S COMMON NAME adfruit Bur-Reed	Hawthorn Blackhaw S Northcentral and North s and shrubs shall be l upon availability and d ore than 40% of habit LANTING FOR WETL SLOPE STABILIZATI COMMON NAM Pussy Willow Sandbar Willow d on Northcentral and ts/acre usased upon availability enter UBMERGED AQUATI	AND/WATE AND/WATE AND/WATE AND/WATE Northeast and coordin IC VEGETA DENSIT 15%	FACU FACU TOTA and USACEs ear seedings. with engineer d shrubs should irway BICATOR STATUS FACW TOTAL: JSDA and USA aution with engineer to the spectrum for PO for LBS PE 2.	AL: subregion. d be rando PLANTIN ARE ACR 1. QUAN (STAF 122 244 ACE subregineer DND R ACRE	48 48 48 240 mly planted 3 AREA A 1 ES: 4 TITY (ES) 10 10 10 10 10 10 10 10 10 10	NG AREA 4 ACRES: 0.62 EMBAYMENT QUANTITY (LBS) 1.39		Anner: 60( This dra It is protu- informatic perrotu- informatic P P P S S C C C C C C C C C C C C C C C	L NNAL C NNAL	A AVENUE, 00 1 43604 ed and is the sole of the project owner in the project owner in the project owner in the project owner in the arwing or the evered 0220 Data N 10/23/1 (503) 11/12/1 (503) 01/30/2 (503) 01/30/2
* Wetlan Canopy - Quantii - Substit - No sing hroughor - S - S - S - S - S - S - S - S - S - S	Crategus mollis Viburnum prunifolium d indicator status based on 1 trees shall be 1-inch calipen y based on 80 stems/acre titons may be made based le species may comprise m it respective habitat areas. TABLE 6: LIVE STAKE PI RIPARIAN SCIENTIFIC NAME ix discolor ix interior/exigua /etland indicator status base uantity based on 1742 stem ubstitutions may be made t pace live stakes 5-foot on co UABLOK) FOR AREA 4 - S COMMON NAME adfruit Bur-Reed tstem Bulrush	Hawthorn Blackhaw S Northcentral and North s and shrubs shall be l upon availability and d ore than 40% of habit LANTING FOR WETL SLOPE STABILIZATI COMMON NAM Pussy Willow Sandbar Willow d on Northcentral and Is/acre ased upon availability enter UBMERGED AQUATI	AND/WATE ON AND/WATE ON ME Northeast Northeast CVEGETA DENSIT 15% 5%	FACU FACU TOTA and USACEs ear seedings. with engineer d shrubs should random status ranus FACW TOTAL: JSDA and USA aution with engineer to the second to the	AL: subregion. d be rando PLANTIN ARE ACR 1. QUAN (STAF 122 122 122 244 ACE subres ineer DND R ACRE 25 75 75	48 48 240 mly planted 3 AREA A 1 ES: 4 TITY (ES) 10 10 10 10 10 10 1.84 0.61 0.61 0.61	NG AREA 4 ACRES: 0.62 EMBAYMENT QUANTITY (LBS) 1.39 0.46		Anner: 60( This dra It is protu- informatic perm Mork D P P P P P P P P P P P P P	LINE LINE LINE LINE LINE LINE LINE LINE	A AVENUE, 00 1 43604 ad and is the sole of line drawing of the project owner in the project o
* Wetlan t Canopy - Quantii - Substiti - No sing - No sing - No sing - S - S - S - S - S - S - S - S	Cratagus mollis Viburnum prunifolium d indicator status based on l trees shall be 1-inch caliper y based on 80 stems/acre titons may be made based le species may comprise m it respective habitat areas. TABLE 6: LIVE STAKE PI RIPARIAN SCIENTIFIC NAME ix discolor ix Interior/exigua /etland indicator status base uantity based on 1742 sterr ubstitutions may be made t pace live stakes 5-foot on co UABLOK) FOR AREA 4 - S COMMON NAME adfruit Bur-Reed Istem Bulrush Digrass	Hawthorm Blackhaw S Northcentral and North s and shrubs shall be l upon availability and d ore than 40% of habit LANTING FOR WETL SLOPE STABILIZATI COMMON NAM Pussy Willow Sandbar Willow d on Northcentral and Is/acre ased upon availability enter UBMERGED AQUATI INDICATOR STATUS* OBL OBL OBL	The set USDA bareroot 2-y coordination is at the set us of the set	FACU FACU TOTA and USACE sear seedlings. with engineer d shrubs shouk RWAY DICATOR STATUS' FACW TOTAL: USDA and USA TOTAL: USDA and USA tation with engineer ( LBS PE 2. 0. 0.	AL: subregion. d be rando PLANTIN ARE ACR 1. QUAN (STAF 122 244 ACE subres ineer DND ER ACRE 25 75 75 75	48 48 48 240 mly planted 3 AREA A 1 ES: 4 1 TITY (ES) 10 10 10 10 10 10 10 10 10 10	NG AREA 4 ACRES: 0.62 EMBAYMENT QUANTITY (LBS) 1.39 0.46 0.46		Amer: 600 This dr Reproduce formation formation formation From the formation From the formation F	LINE CONTRACTOR OF CONTRACTOR	A AVENUE, 00 1 43604 ad and is the sole of this drawing or the the project owner of this drawing or the without the where the project owner of this drawing or the without the where without the where the project owner of the project owner
* Wetlan Canopy - Quanti - Substit - No sing Sal Sal Sal Sal Sal Sal Sal Sal Sal Sal	Cratagus mollis Viburnum prunifolium d indicator status based on l trees shall be 1-inch caliper y based on 80 stems/acre titons may be made based le species may comprise m it respective habitat areas. TABLE 6: LIVE STAKE PI RIPARIAN SCIENTIFIC NAME ix discolor ix Interior/exigua /etland indicator status base uantity based on 1742 sterr ubstitutions may be made t pace live stakes 5-foot on co UABLOK) FOR AREA 4 - S COMMON NAME adfruit Bur-Reed Istem Bulrush olgrass erican Water Plantain Kerelweed	Hawthorn Blackhaw S Northcentral and North s and shrubs shall be l upon availability and d ore than 40% of habit LANTING FOR WETL SLOPE STABILIZATI COMMON NAM Pussy Willow Sandbar Willow d on Northcentral and Is/acre ased upon availability enter UBMERGED AQUATI INDICATOR STATUS* OBL OBL OBL OBL	The set USDA bareroot 2-y coordination at, trees and AND/WATE ION ME IN Northeast I and coordin IC VEGETA DENSIT 15% 5% 5% 5%	FACU FACU TOTA and USACE sear seedlings. with engineer d shrubs shouk RWAY DICATOR FACW TOTAL: JSDA and USA hation with engineer ( LBS PE 2. 0. 0. 1.	AL: Subregion. AL: Subregion. PLANTIN ARE ACR 1.2 QUAN (STAP 122 122 244 ACE subres ineer DND R ACRE 25 75 50	48 48 240 mly planted G AREA A 1 ES: 4 TITY (ES) 100 00 00 00 00 00 00 00 00 0	NG AREA 4 ACRES: 0.62 EMBAYMENT QUANTITY (LBS) 1.39 0.46 0.46 0.46 0.93		Armer: 600 This dr. This dr. Thi	LIN LIN LIN D JEFFERSON SUITE 3 TOLEDO, OL SUITE 3 SUITE 3	AVENUE, 00 1 43604 ad and is the sole of the project owner of the drawing or the without the writter the project owner of the drawing or the writter N 10/29/1 N 02/21/2 N 02/
* Wetlan Canopy - Cuanti - Substit - No sing Sal Sal - V - C - S - S - S - S - S - S - S - S	Crategus mollis Viburnum prunifolium d indicator status based on l trees shall be 1-inch calipen y based on 80 stems/acre titons may be made based le species may comprise m it respective habitat areas. TABLE 6: LIVE STAKE PI RIPARIAN SCIENTIFIC NAME ix discolor ix interior/exIgua /etland indicator status base uantity based on 1742 ster ubstitutions may be made to pace live stakes 5-foot on c UABLOK) FOR AREA 4 - S COMMON NAME adfruit Bur-Reed tstem Bulrush Jojarass erican Water Plantalin Kerelweed ighair Sedge	Hawthorn Blackhaw S Northcentral and North s and shrubs shall be l upon availability and d ore than 40% of habit LANTING FOR WETL SLOPE STABILIZATI COMMON NAM Pussy Willow Sandbar Willow d on Northcentral and Is/acre assed upon availability enter UBMERGED AQUATI INDICATOR STATUS' OBL OBL OBL OBL OBL	LEAST USDA bareroot 2-y coordination at, trees and AND/WATE ION ME IN Northeast I and coordin IC VEGETA DENSIT 15% 5% 5%	FACU FACU TOTP and USACE sear seedlings. with engineer d shrubs shouk RWAY DICATOR STATUS' FACW TOTAL: JSDA and US/ aution with engineer (LBS PE 2. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.	AL: Subregion. AL: Subregion. PLANTIN ARE ACR 1. QUAN (STAF 122 122 122 122 122 122 122 12	48 48 48 240 mly planted 3 AREA A1 ES: 4 TITY (ES) 10 10 10 10 10 10 10 10 10 10	NG AREA 4 ACRES: 0.62 EMBAYMENT QUANTITY (LBS) 1.39 0.46 0.46 0.46 0.46 0.46 0.46 0.46 0.46		Armer: 600 This dr. This dr. This dr. Control of the second	LINE STATES STAT	AVENUE, 00 1 43604 ed and is the sole of the project owner, of the drawing or the without the writter of the drawing or the the project owner, of the drawing or the sole of the project owner, of the drawing or the writter N 10/29/1 V (302) 11/12/1 (903) 11/12/6/ (903) 11/12/6/ (903) 11/12/6/ (903) 01/30/2 x) 02/21/2 x) 02/21/2 x) 02/21/2 x) 02/21/2 x) 02/25/2 x) 02/25/
* Wetlan Canopy - Quanti - Substit - No sing - No sing - Sal - Sal	Crategus mollis Viburnum prunifolium d indicator status based on I trees shall be 1-inch calipen y based on 80 stems/acre utions may be made based le species may comprise m it respective habitat areas. TABLE 6: LIVE STAKE PI RIPARIAN SCIENTIFIC NAME ix discolor ix Interior/exIgua /etland indicator status base uantity based on 1742 ster ubstitutions may be made to pace live stakes 5-foot on co UABLOK) FOR AREA 4 - S COMMON NAME adfruit Bur-Reed tstem Bulrush olgrass erican Water Plantalin kerelweed igad Sedge iged Sedge	Hawthorn Blackhaw S Northcentral and North s and shrubs shall be l upon availability and d ore than 40% of habit SLOPE STABILIZATI COMMON NAM Pussy Willow Sandbar Willow d on Northcentral and Is/acre assed upon availability anter UBMERGED AQUATI INDICATOR STATUS* OBL OBL OBL OBL OBL OBL	Least USDA bareroot 2-y coordination tat, trees and AND/WATE ION ME IN Northeast IC VEGETA DENSIT 15% 5% 5% 5% 5%	FACU FACU TOTA and USACE sear seedlings. with engineer d shrubs shouk raturs shouk	AL: subregion. d be rando PLANTIN ARE ACR 1.2 122 122 122 122 122 122 122 122 122	48 48 48 240 mly planted 3 AREA A 1 ES: 4 TITY (ES) 10 10 10 10 10 10 10 10 10 10	NG AREA 4 ACRES: 0.62 EMBAYMENT QUANTITY (LBS) 1.39 0.46 0.46 0.46 0.33 0.46 0.33 0.46 1.39		Arner: 600 This dr. Reproduce Ferroret From By Project N Project N Project N Project N Check By Scole: Layout By Check By Scole: Layout By Scole: Layout By Check By Scole: Layout By Check By Scole: Layout By Check By Scole: Layout By Scole: Layo	LINE CONTRACTOR OF CONTRACTOR	AVENUE, 00 1 43604 ed and is the sole of this drawing or the without the written the project owner, of this drawing or the writhout the written the project owner, of this drawing or the writhout the written the project owner, of this drawing or the written the project owner, of this drawing or the written the project owner, of this drawing or the written the project owner, of the project owner, owne
* Wetlan Canopy - Quanti - Substit - No sing - No sing - No sing - S - S - S - S - S - S - S - S - S - S	Crategus mollis Viburnum prunifolium d indicator status based on I trees shall be 1-inch calipen y based on 80 stems/acre titons may be made based le species may comprise m it respective habitat areas. TABLE 6: LIVE STAKE PI RIPARIAN SCIENTIFIC NAME ix discolor ix Interior/ex/gua Vetland indicator status base uantity based on 1742 ster ubstitutions may be made t pace live stakes 5-foot on c UABLOK) FOR AREA 4 - S COMMON NAME adfruit Bur-Reed Istem Bulrush Digrass erican Water Plantain kerelweed igal Sedge iged Sedge a Cutgrass lequin Blueflag	Hawthorn Blackhaw S Northcentral and North s and shrubs shall be l upon availability and d ore than 40% of habit SLOPE STABILIZATI COMMON NAM Pussy Willow Sandbar Willow d on Northcentral and Is/acre assed upon availability anter UBMERGED AQUATI INDICATOR STATUS* OBL OBL OBL OBL OBL OBL OBL OBL OBL	Least USDA bareroot 2-y coordination at, trees an AND/WATE ION ME IN Northeast I and coordin IC VEGETA DENSIT 15% 5% 5% 5% 5% 5% 5% 5% 5% 5% 5% 5% 5% 5	FACU FACU TOTA and USACE sear seedlings. with engineer d shrubs shouk shrubs shouk shrubs shouk shrubs shouk FACW FACW TOTAL: JSDA and US/ station with engineer to the search search search search should be should be should be the search search search search search to the search search search search search should be should be should be should be the search s	AL: subregion. d be rando PLANTIN ARE ACR 1. QUAN (STAF 122 122 122 122 122 122 122 122 122 12	48 48 48 240 mly planted G AREA A 1 ES: 4 TITY (ES) 10 10 10 10 10 10 10 10 10 10	NG AREA 4 ACRES: 0.62 EMBAYMENTY (LBS) 1.39 0.46 0.46 0.93 0.46 1.39 0.46		Finis dr. This dr. Reproduce Reproduce Service Content Reproduce Reproduce Reproduce Peroject N Peroject N Perover By Project N Pict Duck Dyout By Prover By Scole: Check By Scole:	LINE Copyright Sector Description Description Description Description Description Description Description Construction De	AVENUE, 00 1 43604 ed and is the sole of the project conner, of the drawing or the project conner, of the drawing or the project conner, of the drawing or the project conner, the project conner, t
* Wetlan Canopy - Quantin - Substit - No sing - No sing - No sing - No sing - S - S - S - S - S - S - S - S - S - S	Crategus mollis Viburnum prunifolium d indicator status based on 1 trees shall be 1-inch caliper y based on 80 stems/acre titons may be made based le species may comprise m it respective habitat areas. TABLE 6: LIVE STAKE PI RIPARIAN SCIENTIFIC NAME ix discolor ix interior/exigua /etland indicator status base uantity based on 1742 stem batitutions may be made to pace live stakes 5-foot on co UABLOK) FOR AREA 4 - S COMMON NAME adfruit Bur-Reed Istem Bulrush olgrass erican Water Plantain kerelweed gipal r Sedge iged Sedge e Cutgrass lequin Blueflag sh Seedbox	Hawthorn Blackhaw S Northcentral and North s and shrubs shall be l upon availability and ore than 40% of habit stope stability and ore than 40% of habit COMMON NAM Pussy Willow Sandbar Willow d on Northcentral and Is/acre used upon availability enter UBMERGED AQUATI INDICATOR STATUS* OBL OBL OBL OBL OBL OBL OBL OBL OBL	Least USDA bareroot 2-y coordination tat, trees and AND/WATE ION ME IN Northeast I and coordin IC VEGETA DENSIT 15% 5% 5% 10% 5% 5%	FACU FACU TOTA and USACEs ear seedings. with engineer d shrubs should read shrubs	AL: subregion. d be rando PLANTIN ARE ACR 1. QUAN (STAF 122 122 122 122 122 122 122 122 122 12	48 48 48 240 mly planted 3 AREA A1 ES: 4 1 1 4 1 2 4 1 1 2 4 1 2 4 1 2 4 1 1 2 4 1 1 2 4 1 1 2 4 1 1 2 4 1 1 2 4 1 1 2 4 1 1 2 4 1 1 2 4 1 1 2 4 1 1 1 2 1 1 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1	NG AREA 4 ACRES: 0.62 EMBAYMENT QUANTITY (LBS) 0.46 0.46 0.46 0.93 0.46 1.39 0.46 1.39 0.46		Arner: 600 This dri Reproduce It is produce point Fri C C P Project N Pict Date Crown By Pict Date Lagout By Check By Scola: Lague Dat Scola:	LINE Copyright probability of the second second second sec	AVENUE, 00 4 43604 ed and is the sole of the project evener of the drawing or the without the writed evved 10/29/1 4 (302) 11/12/1 (502) 11/12/1
* Wetlan Canopy - Quantin - Substit - No sing - No sing - No sing - Sat - Sat	Crategus mollis Viburnum prunifolium di indicator status based on l trees shall be 1-inch calipen y based on 80 stems/acre titons may be made based le species may comprise m it respective habitat areas. TABLE 6: LIVE STAKE PI RIPARIAN SCIENTIFIC NAME ix discofor Ix Intertor/exigua /etland indicator status base uantity based on 1742 stem ubstitutions may be made to pace live stakes 5-foot on co UABLOK) FOR AREA 4 - S COMMON NAME adfruit Bur-Reed tstem Bulrush ojgrass erican Water Plantain Kerelweed gighalr Sedge a Cutgrass equin Blueflag sh Seedbox adleaf Arrowhead	Hawthorn Blackhaw S Northcentral and North s and shrubs shall be l upon availability and ( ore than 40% of habit LANTING FOR WETL SLOPE STABILIZATI COMMON NAM Pussy Willow Sandbar Willow d on Northcentral and Is/acre wased upon availability enter UBMERGED AQUATI INDICATOR STATUS* OBL OBL OBL OBL OBL OBL OBL OBL OBL OBL	AND/WATE AND/WATE ION AND/WATE ION ME INOR IC VEGETA DENSIT 15% 5% 5% 15% 15% 15% 15% 15%	FACU FACU TOTA and USACEs ear seedlings. with engineer d shrubs should rubs should rubs should rubs should rubs should rubs should rubs should rubs facw FACW FACW FACW TOTAL: USDA and USA rubs PE 2. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.	AL: subregion. d be rando PLANTIN ARE ACR 12: 12: 12: 24/ ACE subres ineer IND R ACRE 25 75 75 50 75 50 75 50 75 50 75 50	48 48 48 240 mly planted 3 AREA A1 ES: 4 TITY 4ES) 10 10 10 10 10 10 10 10 10 10	NG AREA 4 ACRES: 0.62 EMBAYMENT QUANTITY (LBS) 0.46 0.46 0.46 0.46 0.46 1.39 0.46 1.39 0.46 0.46 0.46 0.46 0.46 0.46 0.46		Froject N Project N Projec	LINE Copyright property Lines Copyright property Hull & Association of Hull is a second of the second of the second property Hull & Association of Hull is a All fights res Copyright is a second of the second of the second second of the second of the second of the second property Hull & Association of Hull is a All fights res Copyright Desson of Hull is a Copyright Desson of Hull is a Copyright Desson (food construction Re- man of the second of the second of the copyright Desson (food construction Re- man of the second of the sec	AVENUE, 00 1 43604 ad and is the sole of the groget owner, the groget owner, the drawing or but the drawing or but th
* Wetlan <sup>†</sup> Canopy - Quantin - Substit - No sing - No sing - No sing - S - S - S - S - S - S - S - S	Crategus mollis Viburnum prunifolium d indicator status based on 1 trees shall be 1-inch caliper y based on 80 stems/acre titons may be made based le species may comprise m it respective habitat areas. TABLE 6: LIVE STAKE PI RIPARIAN SCIENTIFIC NAME ix discolor Ix Interior/exigua /etland indicator status base uantity based on 1742 stem ubstitutions may be made t pace live stakes 5-foot on co UABLOK) FOR AREA 4 - S COMMON NAME adfruit Bur-Reed Istem Bulrush Digrass erican Water Plantain kerelweed ghair Sedge a Cutgrass lequin Blueflag sh Seedbox adleaf Arrowhead nlock Waterparsnip	Hawthorn Blackhaw S Northcentral and North s and shrubs shall be l upon availability and d ore than 40% of habit LANTING FOR WETL SLOPE STABILIZATI COMMON NAM Pussy Willow Sandbar Willow d on Northcentral and ts/acre usased upon availability enter UBMERGED AQUATI INDICATOR STATUS* OBL OBL OBL OBL OBL OBL OBL OBL OBL OBL	AND/WATE AND/WATE AND/WATE ION ME IN Northeast and coordin IC VEGETA DENSIT 15% 5% 10% 5% 15% 15% 15% 15% 15% 15% 15%	FACU FACU TOTA and USACEs ear seedings. with engineer d shrubs should shrubs should iRWAY DICATOR STATUS' FACW FACW TOTAL: USDA and US/ Nation with engineer (LBS PE 2. 0. 0. 0. 2. 2. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.	AL: subregion. d be rando PLANTIN ARE ACR 127 122 244 ACE subregineer ineer IND R ACRE 25 75 75 75 50 75 50 75 50 75	48 48 48 240 mly planted G AREA A 1 ES: 4 TITY ES: 0 00 10 10 10 10 10 10 10 10	NG AREA 4 ACRES: 0.62 EMBAYMENT QUANTITY (LBS) 1.39 0.46 0.46 0.46 0.46 0.46 0.46 0.46 0.46		Arner: 600 This dra This dra ti is produce the produce Froject N Project N Project N Project N Project N Scole: Issue Det TH Project N Project N Proj	LANTING	A AVENUE, 00 1 43604 ed and is the sole of the generation of the sole of the generation of the sole of the sole of the sole of the sole of the sole of the sole of the sole of the sole of the sole of the sole of the sole of the sole of the sole of the sole of the sole of the sole of the sole of the s

TABLE	5: WOODY	STEM	PLANTING	FOR	MESIC	TO	DRY	FORE	-

					PLANTING AREA		Environ	ment / Energy /	Infractructure
TARI	E 4. WOODY STEM PLAN	TING FOR FOREST	D WETLAN		AREA 2		Environi	nent/ Energy/	miasuuciun
					ACRES 3.0		Hull & Ass 219 S. Eri	ociates, Inc. Pho e Street Fax	18: (419) 385-201 (419) 243-1881
				INDICATOR	QUANTITY		Toledo, OH	43604 warm	hullinc.com
	SCIENTIFIC NAME	COMMON Red Maple	NAME	FAC	(STEMS') 30		Professiona	Seci:	
	Acer saccharinum	Siver Maple		FACW	30			- 5 00	Sec. 1
VOPY	Salix nigra	Black Willow		OBL	30			and and	the state
EES	Platanus occidentalis	American Syca	more	FACW	30		1	al h	A A
	Quercus bicolor	Swamp White (	Dak	FACW	30			EXCINE 1	
	Amnia melanocama	Black chokehe	rn/	FAC	30		1	AL CORES	- 181 -
	Cephalanthus occidenta	lis Buttonbush	iiy	FACW	30			XAL	EL.
RUBS	Cornus amomum	Silky dogwood		FACW	30			No. because	have a c
	Cornus sericea	Red-osier dogy	wood	FAC	30			31	GARE
	Sambucus canadensis	Elderberry		FACW	30				
letland inopy uantity ubstitu o sing andor	d indicator status based on trees shall be 1-inch caliper y based on 100 stems/acre utions may be made based le species may comprise n nly planted throughout resp	Northcentral and North s and shrubs shall be l upon availability and o nore than 40% of habit pective habitat areas.	bareroot 2-ye coordination at, trees and	and USACE subreg ear seedlings. with engineer I shrubs should	ion.			WETLANDS	
BLE	5: WOODY STEM PLANT	ING FOR MESIC TO I	DRY FORES		PLANTING AREA		INGS	DPLAIN	C
					ACRES 6.0		I ₹	5 S	o H
			8	INDICATOR	QUANTITY		N N	25	ШŃ
	SCIENTIFIC NAME	COMMON	NAME	STATUS*	(STEMS <sup>†</sup> )			E P	5
	Quercus rubra	Red Oak	1	FACU	48		6	0 AL	Ξ
IOPY	Quercus alba	Tulintee		FACU	40		Ē	LS L	ц Б С
EES	Quercus macrocarpa	Burr Oak		FACU	48		1 3	Ϋ́Α	70
	Juglans nigra	Black Walnut		FACU	48		R R	20	E S
			2 1	TOTAL:	240		S I	E S	
	Amelanchier arborea	Common Servi	севепту	FACU	48		N S	L	-
RUBS	Cercis canadensis	Hazelout		FACU	40		Ŭ	ອ –	
	- si jius americana	uconut						LE.	
	Crataegus mollis	Hawthorn		FACU	48			ш	
'etlanc nopy uantity	Crataegus mollis Viburnum prunifolium I indicator status based on trees shall be 1-inch caliper y based on 80 stems/acre	Hawthom Blackhaw S Northcentral and North s and shrubs shall be l	NEAST USDA	FACU FACU TOTAL: and USACE subreger ear seedlings.	48 48 240 jion.	rowwood		PENN 7 EME	
/etlanc nopy uantity ubstitu o sing ughou	Crataegus mollis Viburnum prunifolium I indicator status based on trees shall be 1-inch caliper y based on 80 stems/acre tions may be made based le species may comprise n t respective habitat areas.	Hawthorn Blackhaw S Northcentral and North s and shrubs shall be l upon availability and d nore than 40% of habit	neast USDA bareroot 2-ye coordination at, trees and	FACU FACU TOTAL: and USACE subregear seedlings. with engineer I shrubs should be r	48 48 240 jion. andomly planted	rowwood	Owner:	PENN 7 EME	No.
letlanc nopy uantity ubstitu ubstitu ughou	Cratagus mollis Viburnum prunifolium I indicator status based on trees shall be 1-inch caliper / based on 80 stems/acre tions may be made based le species may comprise n t respective habitat areas. TABLE 6: LIVE STAKE P RIPARIAN	Hawthorn Blackhaw S Northcentral and North s and shrubs shall be l upon availability and ore than 40% of habit LANTING FOR WETL SLOPE STABILIZATI	AND/WATE ON	FACU FACU TOTAL: and USACE subreg aar seedlings. with engineer shrubs should be r	48 48 240 jion. andomly planted MTING AREA AREA 1 ACRES: 1.4	rowwood	Owner:	DEENN 7 EME	AVENUE,
letlanc nopy uantity ubstitu o singi ughou	Cratagus mollis Viburnum prunifolium I indicator status based on trees shall be 1-inch caliper based on 80 stems/acre tions may be made based le species may comprise n t respective habitat areas. TABLE 6: LIVE STAKE P RIPARIAN SCIENTIFIC NAME	Hawthorn Blackhaw S Northcentral and North s and shrubs shall be l upon availability and ore than 40% of habit LANTING FOR WETL SLOPE STABILIZATI	AND/WATE ON	FACU FACU TOTAL: and USACE subreg aar seedlings. with engineer shrubs should be r shrubs should be r PLA PLA	48 48 240 jion. andomly planted MTING AREA AREA 1 ACRES: 1.4 ULANTITY	rowwood	Owner: 	HWE L NNE	AVENUE, 00 43604
letlanc nopy uantity ubstitu o sing ughou	Cratagus mollis Viburnum prunifolium I indicator status based on trees shall be 1-inch caliper / based on 80 stems/acre titons may be made based le species may comprise n t respective habitat areas. TABLE 6: LIVE STAKE P RIPARIAN SCIENTIFIC NAME	Hawthorn Blackhaw S Northcentral and North s and shrubs shall be l upon availability and c ore than 40% of habit LANTING FOR WETL SLOPE STABILIZATI COMMON NAM	AND/WATE ON IE IN IE	FACU FACU TOTAL: and USACE subreg aar seedlings. with engineer i shrubs should be r shrubs should be r PLA DICATOR TATUS* (	48 48 240 jion. andomly planted NTING AREA AREA 1 ACRES: 1.4 UANTITY STAKES) 1220	rowwood	Owner: 60	HWH L NNH	AVENUE, 00 43604
etlanc nopy uantity ustitu o sing ughou Sali	Cratagus mollis Viburnum prunifolium I indicator status based on trees shall be 1-inch caliper / based on 80 stems/acre titons may be made based le species may comprise m t respective habitat areas. TABLE 6: LIVE STAKE P RIPARIAN SCIENTIFIC NAME x discolor / Interior/extruta	Hawthorn Blackhaw S Northcentral and North s and shrubs shall be l upon availability and c toore than 40% of habit LANTING FOR WETL SLOPE STABILIZATI COMMON NAN Pussy Willow Sandhar Willow	AND/WATE ON IE IN IE IN	FACU FACU TOTAL: and USACE subreg aar seedlings. with engineer shrubs should be r shrubs should be r PLA PLA DICATOR C TATUS* ( FACW	48 48 240 jion. andomly planted ARCEA 1 ACRES: 1.4 UANTITY STAKES) 1220 1220	rowwood	Owner: 60 This d	HWE L NNEE L NNEE DO JEFFERSON SUITE 33 TOLEDO, OH Traving is copyright	AVENUE, 0 43604
etlanc nopy uantity ubstitu o sing ughou Sali	Cratagus mollis Viburnum prunifolium I indicator status based on trees shall be 1-inch caliper / based on 80 stems/acre titons may be made based le species may comprise n t respective habitat areas. TABLE 6: LIVE STAKE P RIPARIAN SCIENTIFIC NAME x discolor x interior/exigua	Hawthorn Blackhaw S Northcentral and North s and shrubs shall be l upon availability and c ore than 40% of habit LANTING FOR WETL SLOPE STABILIZATI COMMON NAN Pussy Willow Sandbar Willow	AUG heast USDA bareroot 2-yr xoordination at, trees and AND/WATE ON IE IN S	FACU FACU TOTAL: and USACE subreg aar seedlings. with engineer i shrubs should be r shrubs should be r DICATOR TATUS* ( FACW FACW TOTAL:	48 48 240 jion. andomly planted NTING AREA AREA 1 ACRES: 1.4 UANTITY STAKES) 1220 1220 1220 1220 1240	rowwood	Owner: 60 This d	HILL & Associal	AVENUE, 00 43604 sd and is the s ea, Inc.
etlanc nopy uantity ubstitu o sing ughou Sali Sali Sali Sali Sali Sali Sali Sali	Cratagus mollis Viburnum prunifolium I indicator status based on trees shall be 1-inch caliper y based on 80 stems/acre titons may be made based le species may comprise n t respective habitat areas. TABLE 6: LIVE STAKE P RIPARIAN SCIENTIFIC NAME x discolor x Interior/exigua etland indicator status base ushtly based on 1742 ster ubstitutions may be made l pace live stakes 5-foot on c	Hawthorn Blackhaw S Northcentral and North s and shrubs shall be l upon availability and d ore than 40% of habit LANTING FOR WETL SLOPE STABILIZATI COMMON NAM Pussy Willow Sandbar Willow Sandbar Willow ed on Northcentral and ns/acre based upon availability enter	AND/WATE ON Northeast L AND/WATE ON	FACU FACU TOTAL: and USACE subreg sar seedlings. with engineer shrubs should be r RWAY DICATOR TATUS* FACW TOTAL: ISDA and USACE s ation with engineer	48 48 240 jon. andomly planled MTING AREA AREA 1 ACRES: 1.4 UUANTITY STAKES) 1220 2440 subregion.	rowwood	Owner: 60 This d Reprodu informat per	HWB L NNAB L NNAB DO JEFFERSON SUITE 33 TOLEDO, OH Hull & Associat roduced for use by concert for use by the second for use by concert for use by the second for use by the the second for use by the second for use by the second for use by the second for use by the second for use by the second for use by the second for use by the second for use by the second for use by the second for use by the second for use by the second for use by the second for use by the second for use by the second for use by the second for use by the the second for use by the second for use by the second for use by the second for use by the second for use by the second for use by the second for use by the second for use by the second for use by the second for use by the second	AVENUE, 00 43604 43604 sa, Inc. the project own their drawing including icity prohibilec icity prohibilec icity prohibilec
letlanc nopy uantity ubstitu o sing ughou sing Sali Sali Sali Sali Sali Sali Sali Sali	Cratagus mollis Viburnum prunifolium I indicator status based on trees shall be 1-inch caliper y based on 80 stems/acre tions may be made based le species may comprise m t respective habitat areas. TABLE 6: LIVE STAKE P RIPARIAN SCIENTIFIC NAME x discolor x Interior/exigua letland indicator status base untity based on 1742 ster ubstitutions may be made lo pace live stakes 5-foot on c	Hawthorn Blackhaw S Northcentral and North s and shrubs shall be l upon availability and ( ore than 40% of habit LANTING FOR WETL SLOPE STABILIZATI COMMON NAM Pussy Willow Sandbar Willow ad on Northcentral and ns/acre based upon availability enter	AND/WATE ON Northeast L AND/WATE ON	FACU FACU TOTAL: and USACE subreg aar seedlings. with engineer shrubs should be r shrubs should be r shrubs should be r SDCATOR TATUS* FACW TOTAL: SDA and USACE s ation with engineer	48 48 240 jion. andomly planted Arrea 1 ACRES: 1.4 ILANTITY STAKES) 1220 1220 2440 uubregion.	TOWNOOD	Gener: 60 This d Reprodu informat per	UNAL CANNED CONTRACTOR CONT	AVENUE, 00 43604 43604 as, Inc. he project own this drawing a withocube w city prohibite ryzed
Vetlance nopy uantity ubstitu o sing ughou Sali Sali Sali - Si - Si - Si	Crategus mollis Viburnum prunifolium I indicator status based on trees shall be 1-inch caliper / based on 80 stems/acre titons may be made based le species may comprise m t respective habitat areas. TABLE 6: LIVE STAKE P RIPARIAN SCIENTIFIC NAME x discolor x Interior/exigua tetland indicator status bases uantity based on 1742 stem ubstitutions may be made bace live stakes 5-foot on c	Hawthorn Blackhaw S Northcentral and North s and shrubs shall be l upon availability and ore than 40% of habit LANTING FOR WETL SLOPE STABILIZATI COMMON NAN Pussy Willow Sandbar Willow ad on Northcentral and ns/acre based upon availability enter	AND/WATE ON IE Northeast L and coordin	FACU FACU TOTAL: and USACE subreg aar seedlings. with engineer shrubs should be r shrubs should be r shrubs should be r PLA PLA DICATOR CO TATUS' (FACW TOTAL: SDA and USACE s ation with engineer	48 48 240 jion. andomly planted ACRES: 1.4 UANTITY STAKES) 1220 120 1	IG AREA 4 ACRES:	Owner: 60 This d Reprodu informat per	UNITY OF CONTRACT	AVENUE, 10 43604 xd and is the s as, Inc. he project own this drawing without the w city prohibited ryzed 10/ (300) 11/
Vetlance nopy uantity ubstitu o sing ughou Sali Sali Sali - St - St - St	Crategus mollis Viburnum prunifolium I indicator status based on trees shall be 1-inch caliper y based on 80 stems/acre tions may be made based le species may comprise n t respective habitat areas. TABLE 6: LIVE STAKE P RIPARIAN SCIENTIFIC NAME x discolor x Interior/exigua tetland indicator status base uantity based on 1742 ster ubstitutions may be made I pace live stakes 5-foot on c	Hawthorn Blackhaw S Northcentral and North s and shrubs shall be l upon availability and c ore than 40% of habit LANTING FOR WETL SLOPE STABILIZATI COMMON NAN Pussy Willow Sandbar Willow ad on Northcentral and ns/acre based upon availability renter	AND/WATE ON Northeast U AND/WATE ON Northeast U and coordin	FACU FACU TOTAL: and USACE subreg aar seedlings. with engineer i shrubs should be r shrubs should be r PLA PLA PLA DICATOR TATUS' () FACW TOTAL: SDA and USACE s ation with engineer	48 48 240 jion. andomly planted AREA 1 ACRES: 1.4 UANTITY STAKES) 1220 120 1	IG AREA 4 ACRES: 0.62	Owner: 60 This d Reprodu informat per Mort	UNITY OFFICEMENT OFFICE	AVENUE, 10 43604 d and is the s f as, Inc. The project own the proj
Vetlanc nopy uantity ushtitu bosti bos	Crategus mollis Viburnum prunifolium I indicator status based on trees shall be 1-inch caliper y based on 80 stems/acre tions may be made based le species may comprise n t respective habitat areas. TABLE 6: LIVE STAKE P RIPARIAN SCIENTIFIC NAME x discolor x Interior/exigua tetland indicator status base uantity based on 1742 stem ubstitutions may be made I pace live stakes 5-foot on c	Hawthorn Blackhaw S Northcentral and North s and shrubs shall be l upon availability and ( ore than 40% of habit LANTING FOR WETL SLOPE STABILIZATI COMMON NAM Pussy Willow Sandbar Willow Sandbar Willow Sandbar Willow Sandbar Willow Sandbar Willow Sandbar Willow Inter SUBMERGED AQUATI	AND/WATE ON IE Northeast U and coordin	FACU FACU TOTAL: and USACE subreg aar seedlings. with engineer shrubs should be r shrubs should be r PLA RWAY DICATOR DICATOR FACW FACW FACW TOTAL: SDA and USACE s ation with engineer	48 48 240 jion. andomly planted NTING AREA AREA 1 ACRES: 1.4 UANTITY STAKES) 1220 1220 1220 1220 1220 1220 1220 2440 ubregion. PLANTIN ACRES: 0.82 WETLAND INTER- CHANNEL POOL QUANTITY (LBS)	IG AREA 4 ACRES: 0.62 EMBAYMENT QUANTITY (LBS)	Owner: 60 This d Reprodu informat per	UNITE OF CONTRICTION DAYS	AVENUE, 10 43604 rd and is the sc 4 so, Inc. hap project own this drawing without the w city prohibited prod (303) 11/1 (503) 12/4 (503)
letlanc nopy ubstitu o sing ughou <u>Sali</u> <u>Sali</u> - Si - Si D-AQU	Crategus mollis Viburnum prunifolium I indicator status based on trees shall be 1-inch calipen y based on 80 stems/acre titons may be made based le species may comprise n t respective habitat areas. TABLE 6: LIVE STAKE P RIPARIAN SCIENTIFIC NAME x discolor x Interior/exigua tetland indicator status base uantity based on 1742 ster ubstitutions may be made I pace live stakes 5-foot on c JABLOK) FOR AREA 4 - S COMMON NAME	Hawthorn Blackhaw S Northcentral and North s and shrubs shall be l upon availability and d nore than 40% of habit LANTING FOR WETL SLOPE STABILIZATI COMMON NAN Pussy Willow Sandbar Willow ed on Northcentral and ns/acre based upon availability enter	AND/WATE ON Northeast U AND/WATE ON IE Northeast U and coordin IC VEGETA DENSITY 15%	FACU FACU TOTAL: and USACE subreg aar seedlings. with engineer shrubs should be r shrubs should be r PLA RWAY DICATOR DICATOR TATUS' ( FACW TOTAL: SDA and USACE s ation with engineer FION FOR POND LBS PER AC 2.25	48 48 240 jion. andomly planted NTING AREA AREA 1 ACRES: 1.4 UANTITY STAKES) 1220 1240 12	IG AREA 4 ACRES: 0.62 EMBAYMENT QUANTITY (LBS) 1.39	Owner: 60 This d Ris p Reprodu informat per Mork	UNUELONG AND	AVENUE, 10 43604 d and is the sc the project own the drawing c so, Inc. The project own the drawing c to the project own the drawing c to the dra
Vetlanc nopy ushtitu o sing ughou Sali Sali - Si - Si - Si D-AQI	Crategus mollis Viburnum prunifolium I indicator status based on trees shall be 1-inch calipen y based on 80 stems/acce tions may be made based le species may comprise n t respective habitat areas. TABLE 6: LIVE STAKE P RIPARIAN SCIENTIFIC NAME x discolor x Interior/exigua tetland indicator status base uantity based on 1742 sten ubstitutions may be made I pace live stakes 5-foot on c JABLOK) FOR AREA 4 - S COMMON NAME adfruit Bur-Reed	Hawthorn Blackhaw S Northcentral and North s and shrubs shall be l upon availability and d nore than 40% of habit LANTING FOR WETL SLOPE STABILIZATI COMMON NAM Pussy Willow Sandbar Willow ad on Northcentral and ns/acre based upon availability enter SUBMERGED AQUATI	AND/WATE ON IE IN Source IN AND/WATE ON IE IN Source IN DENSITY	FACU     FACU     FACU     TOTAL:     and USACE subreg aar seedlings.      with engineer     I shrubs should be i     reveal and the should be i     comparison of the shou	48 48 240 240 jion. andomly planted Intring AREA AREA 1 ACRES: 1.4 IUANTITY STAKES) 1220 2440 IUBregion. PLANTIR ACRES: 0.82 WETLAND INTER- CHANNEL POOL QUANTITY (LBS) 1.84 0.61 0.64	IG AREA 4 ACRES: 0.62 EMBAYMENT QUANTITY (LBS) 1.39 0.46 0.45	Owner: 60 This d Reprodu informat informat Mork	UIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	AVENUE, 100 43604 as, Inc. he project own this drawing d without the without the without the without the without the without the without the without the 10/(30x) 11/(50x) 11
Vetlanc nopy uantity ubstitu o sing ughou Sali * W - Q - St - St - St D-AQI	Crategus mollis Viburnum prunifolium I indicator status based on trees shall be 1-inch calipen y based on 80 stems/acce tions may be made based le species may comprise n t respective habitat areas. TABLE 6: LIVE STAKE P RIPARIAN SCIENTIFIC NAME x discolor x interior/exigua etland indicator status base uantity based on 1742 stem ubstitutions may be made i bace live stakes 5-foot on c JABLOK) FOR AREA 4 - S COMMON NAME adfruit Bur-Reed stem Bulrush igrass	Hawthorn Blackhaw S Northcentral and North s and shrubs shall be l upon availability and d nore than 40% of habit LANTING FOR WETL SLOPE STABILIZATI COMMON NAM Pussy Willow Sandbar Willow ad on Northcentral and ns/acre based upon availability enter SUBMERGED AQUATI INDICATOR STATUS* OBL OBL OBL	AND/WATE ON IE IN Northeast L and coordin IC VEGETA DENSITY 15% 5%	FACU FACU TOTAL: and USACE subreg aar seedlings. with engineer I shrubs should be r RWAY DICATOR TATUS* DICATOR FACW TOTAL: SDA and USACE s ation with engineer LBS PER AC 2.25 0.75 0.75	48 48 240 jon. andomly planted MTING AREA AREA 1 ACRES: 1.4 UJANTITY STAKES) 1220 1220 1220 2440 ubregion. PLANTIN ACRES: 0.82 WETLAND INTER- CHANNEL POOL QUANTITY (LBS) 1.84 0.61 0.61 0.61	IG AREA 4 ACRES: 0.62 EMBAYMENT QUANTITY (LBS) 1.39 0.46 0.46	Owner: 60 This d Reprodu informat per Mork Project Loyout E	UI CNUE CNUE CNUE CNUE CNUE CNUE CNUE CNUE CNUE CONCEPTUAL DESIGN CONCEPTUAL D	AVENUE, 00 43604 d and is the s d as, Inc. he project own this drawing - witcut far without far witcut far without far witcut far 10/ (303) 11/ (503) 12/ (503) 12/
Vetlanc nopy uantity ubstitu o sing ughou Sali Sali - Su - Su - Su - Su - Su - Su - Su - Su	Crategus mollis Viburnum prunifolium I indicator status based on trees shall be 1-inch calipen y based on 80 stems/acce tions may be made based to species may comprise n t respective habitat areas. TABLE 6: LIVE STAKE P RIPARIAN SCIENTIFIC NAME x discolor x interior/exigua etland indicator status base uantity based on 1742 ster ubstitutions may be made i bace live stakes 5-foot on c JABLOK) FOR AREA 4 - S COMMON NAME adfruit Bur-Reed stem Bulrush igrass trican Water Plantalin isrelweed	Hawthorn Blackhaw Northcentral and North s and shrubs shall be l upon availability and d nore than 40% of habit LANTING FOR WETL SLOPE STABILIZATI COMMON NAN Pussy Willow Sandbar Willow ad on Northcentral and ns/acre Dased upon availability enter SUBMERGED AQUATI INDICATOR STATUS* OBL OBL OBL OBL	AND/WATE ON AND/WATE ON IE IN S ON Northeast L and coordin IC VEGETA DENSITY 15% 5% 5% 5%	FACU FACU TOTAL: and USACE subreg sar seedlings. with engineer I shrubs should be i RWAY DICATOR FACW TOTAL: SDA and USACE s ation with engineer LBS PER AC 2.25 0.75 0.75 1.50	48 48 240 jon. andomly planted NTING AREA AREA 1 ACRES: 1.4 UUANTITY STAKES) 1220 1220 1220 1220 2440 wertenbol inter- CHANNEL POOL QUANTITY (LBS) 1.84 0.61 0.61 1.23	IG AREA 4 ACRES: 0.62 EMBAYMENT QUANTITY (LBS) 1.39 0.46 0.46 0.93	Owner: 60 This d Reprodu information per Mork Project Pict Det Loyout E Drown B	UNIT STATE OF STATE O	AVENUE, 00 43604 d and is the s des, Inc. he project own this drawing - witcut by prohibite victory prohibite (300) 11/ (300) 11/ (3
etlanc nopy uantity ubstitu o sing ughou sali Sali Sali - Si - Si - Si D-AQI Broa Soft Woo Ame Pick Lon	Crategus mollis Viburnum prunifolium I indicator status based on trees shall be 1-inch calipen y based on 80 stems/acre tions may be made based te species may comprise n t respective habitat areas. TABLE 6: LIVE STAKE P RIPARIAN SCIENTIFIC NAME x discolor x Interior/exigua lettand indicator status base uantity based on 1742 ster battutions may be made I bace live stakes 5-foot on c JABLOK) FOR AREA 4 - S COMMON NAME adfruit Bur-Reed stem Bulrush ligrass rican Water Plantain isrelweed ghair Sedge	Hawthorn Blackhaw S Northcentral and North s and shrubs shall be l upon availability and d nore than 40% of habit LANTING FOR WETL SLOPE STABILIZATI COMMON NAM Pussy Willow Sandbar Willow Sandbar Willow Sandbar Willow Based upon availability enter SUBMERGED AQUATI INDICATOR STATUS* OBL OBL OBL OBL OBL	AND/WATE ON AND/WATE ON IE IN Northeast L and coordin IC VEGETA DENSITY 15% 5% 5% 5%	FACU FACU TOTAL: and USACE subreg sar seedlings. with engineer I shrubs should be i RWAY DICATOR FACW TOTAL: ISDA and USACE s ation with engineer LBS PER AC 2.25 0.75 0.75 1.50 0.75	48 48 240 jion. andomly planted NTING AREA AREA 1 ACRES: 1.4 UUANTITY STAKES) 1220 1220 1220 1220 2440 wbregion. PLANTIP ACRES: 0.82 0.82 WETLAND INTER- CHANNEL POOL QUANTITY (LBS) 1.84 0.61 0.61 1.23 0.61	IG AREA 4 ACRES: 0.62 EMBAYMENT QUANTITY (LBS) 1.39 0.46 0.46 0.93 0.46	Owner: 60 This d Reproduced Information Project Project Pict Det Layout E Drown B Check B	LU L L L L L L L L L L L L L	AVENUE, 00 43604 d and is the s fermionic stress fermionic stress d and is the s fermionic stress fermionic stre
etlanc nopy uantity bstitu o sing ughou Sali Sali Sali Sali Sali Sali Sali Sali	Crategus mollis Viburnum prunifolium I indicator status based on trees shall be 1-inch caliper y based on 80 stems/acre tions may be made based te species may comprise n t respective habitat areas. TABLE 6: LIVE STAKE P RIPARIAN SCIENTIFIC NAME x discolor x Interior/exigua ettand indicator status base uantity based on 1742 ster ubstitutions may be made to bace live stakes 5-foot on c UABLOK) FOR AREA 4 - S COMMON NAME adfruit Bur-Reed stem Bulrush igrass erican Water Plantain erelweed ghair Sedge ged Sedge	Hawthorn Blackhaw S Northcentral and North s and shrubs shall be l upon availability and d ore than 40% of habit LANTING FOR WETL SLOPE STABILIZATI COMMON NAM Pussy Willow Sandbar Willow	AND/WATE ON AND/WATE ON IE IN Northeast L and coordin IC VEGETA DENSITY 15% 5% 5% 5% 10% 5%	FACU FACU TOTAL: and USACE subreg sar seedlings. with engineer shrubs should be r RWAY DICATOR FACW TOTAL: ISDA and USACE s ation with engineer ISDA and USACE s ation with engineer LBS PER AC 2.25 0.75 0.	48 48 240 jon. andomly planled NTING AREA AREA 1 ACRES: 1.4 ULANTIFY STAKES) 1220 1220 1220 1220 2440 WeTLAND INTER- CHANNEL POOL QUANTIFY (LBS) 1.84 0.61 0.61 0.61 1.23 0.61 1.84	IG AREA 4 ACRES: 0.62 EMBAYMENT QUANTITY (LBS) 1.39 0.46 0.46 0.93 0.46 0.93 0.46 1.39	Owner: 60 This d Reprodu informer Mark Mark Project I Piot Dat Layout B Check B Scoler	LU L L L L L L L L L L L L L	AVENUE, 00 AVENUE, 00 4 43604 4 43604 4 43604 4 43604 4 43604 4 43604 4 43604 1 4 0 4 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
etlanc nopy justitu justitu justitu Sali Sali Sali Sali Sali Sali Sali Sali	Crategus mollis Viburnum prunifolium I indicator status based on trees shall be 1-inch caliper y based on 80 stems/acre tions may be made based te species may comprise n t respective habitat areas. TABLE 6: LIVE STAKE P RIPARIAN SCIENTIFIC NAME x discolor x interior/exigua etiland indicator status base uantity based on 1742 stem ubstitutions may be made la pace live stakes 5-foot on c JABLOK) FOR AREA 4 - S COMMON NAME adfruit Bur-Reed stem Bulrush Igrass erican Water Plantain aretweed ghair Sedge ged Sedge Cutgrass enuth Bur-Reen	Hawthorn Blackhaw S Northcentral and North s and shrubs shall be l upon availability and ( ore than 40% of habit SLOPE STABILIZATI COMMON NAM Pussy Willow Sandbar Willow Sandbar Willow Sandbar Willow Based upon availability enter SUBMERGED AQUATI INDICATOR STATUS* OBL OBL OBL OBL OBL OBL OBL OBL	AND/WATE ON AND/WATE ON IE IN Northeast L and coordin IC VEGETA DENSITY 15% 5% 5% 15% 15%	FACU FACU TOTAL: and USACE subreg sar seedlings. with engineer shrubs should be r RWAY PLA RWAY PLA PLA PLA PLA PLA PLA PLA PLA	48 48 240 jion. andomly planted AREA 1 ACRES: 1.4 IUANTITY STAKES) 1220 2440 IUbregion. PLANTIF ACRES: 0.82 WETLAND INTERC. QUANTITY (LBS) 1.84 0.61 0.61 0.61 1.84 1.84 0.64 0.64	G AREA 4 ACRES: 0.62 EMBAYMENT QUANTITY (LBS) 1.39 0.46 0.46 0.33 0.46 1.39 0.46	Owner: 60 This d Reprodu informat per Mark Project Piot Det Layout E Drown B Check B Scole: Issue D	LU L L L L L L L L L L L L L	AVENUE, 00 443604 43604 443604 443604 443604 443604 443604 19 project ow 10 project ow
International Sector Se	Crategus mollis Viburnum prunifolium I indicator status based on trees shall be 1-inch caliper y based on 80 stems/acre tions may be made based le species may comprise n t respective habitat areas. TABLE 6: LIVE STAKE P RIPARIAN SCIENTIFIC NAME x discolor x Interior/exigua tetland indicator status base uantity based on 1742 ster ubstitutions may be made I pace live stakes 5-foot on c JABLOK) FOR AREA 4 - S COMMON NAME adfruit Bur-Reed stem Bulrush ligrass rircian Water Plantain rircelweed ghair Sedge ged Sedge cutgrass equin Blueflag sh Seathory	Hawthorn Blackhaw S Northcentral and North s and shrubs shall be l upon availability and d nore than 40% of habit LANTING FOR WETL SLOPE STABILIZATI COMMON NAM Pussy Willow Sandbar Willow ad on Northcentral and ns/acre based upon availability enter SUBMERGED AQUATI NDICATOR STATUS* OBL OBL OBL OBL OBL OBL OBL OBL OBL OBL	AND/WATE ON AND/WATE ON TE IN SOUTION Northeast L and coordin IC VEGETA DENSITY 15% 5% 15% 5% 15% 5% 5%	FACU         FACU         TOTAL:         and USACE subreg par seedlings.         with engineer         I shrubs should be i         I shrubs should be i         DICATOR         CC         TATUS*         SDA and USACE s         ation with engineer         TION FOR POND         LBS PER ACC         2.25         0.75      0.75 <t< td=""><td>48 48 240 jon. andomly planted NTING AREA AREA 1 ACRES: 1.4 UANTITY STAKES) 1220 1220 1220 1220 2440 ubregion. PLANTIN ACRES: 0.82 WETLAND INTER- QUANTITY (LBS) 1.84 0.61 0.61 1.84 0.61 0.</td><td>IG AREA 4 ACRES: 0.62 EMBAYMENT QUANTITY (LBS) 1.39 0.46 0.46 0.46 0.46 0.46 1.39 1.39 0.46 0.46 0.46</td><td>Owner: 60 This d R is p Reprodu informat per Mark Mark Mark Project Poject Poject Drown B Check B Scola: Issue Dc Scheck T</td><td>LU L L L L L L L L L L L L L</td><td>AVENUE, 10 43604 d and is the s 1 so, Inc. he project own the project own the project own the project own 10 (303) 11/ (503) 12/ (503) 12/ (5</td></t<>	48 48 240 jon. andomly planted NTING AREA AREA 1 ACRES: 1.4 UANTITY STAKES) 1220 1220 1220 1220 2440 ubregion. PLANTIN ACRES: 0.82 WETLAND INTER- QUANTITY (LBS) 1.84 0.61 0.61 1.84 0.61 0.	IG AREA 4 ACRES: 0.62 EMBAYMENT QUANTITY (LBS) 1.39 0.46 0.46 0.46 0.46 0.46 1.39 1.39 0.46 0.46 0.46	Owner: 60 This d R is p Reprodu informat per Mark Mark Mark Project Poject Poject Drown B Check B Scola: Issue Dc Scheck T	LU L L L L L L L L L L L L L	AVENUE, 10 43604 d and is the s 1 so, Inc. he project own the project own the project own the project own 10 (303) 11/ (503) 12/ (503) 12/ (5
International Sector Se	Crategus mollis Viburnum prunifolium I indicator status based on trees shall be 1-inch caliper y based on 80 stems/acce tions may be made based le species may comprise n t respective habitat areas. TABLE 6: LIVE STAKE P RIPARIAN SCIENTIFIC NAME x discolor x Interior/exigua etland indicator status base uantity based on 1742 sten ubstitutions may be made l pace live stakes 5-foot on c JABLOK) FOR AREA 4 - S COMMON NAME adfruit Bur-Reed stem Bulrush igrass reclawed ghair Sedge ged Sedge course equin Blueflag sh Seedbox ableaf Arrowhead	Hawthorn Blackhaw S Northcentral and North s and shrubs shall be l upon availability and d nore than 40% of habit LANTING FOR WETL SLOPE STABILIZATI COMMON NAM Pussy Willow Sandbar Willow Sandbar Willow ad on Northcentral and ns/acre based upon availability enter SUBMERGED AQUATI INDICATOR STATUS* OBL OBL OBL OBL OBL OBL OBL OBL OBL OBL	AND/WATE ON AND/WATE ON TE IN Source and ON Northeast L and coordin IC VEGETA DENSITY 15% 5% 10% 5% 15% 15% 5% 15% 5%	FACU         FACU         TOTAL:         and USACE subreg sar seedlings.         with engineer         I shrubs should be i         RWAY         DICATOR         CC         TATUS*         DICATOR         CC         TATUS*         DICATOR         CC         TATUS*         SDA and USACE satisfies         ation with engineer         ICION FOR POND         LBS PER AC         2.25         0.75         1.50         0.75         1.50         0.75         1.50	48 48 240 jon. andomly planted NTING AREA AREA 1 ACRES: 1.4 UANTITY STAKES) 1220 123 0.61 0.61 1.4 0.61 1.4 1.4 0.61 0.61 1.23 0.61 1.23	IG AREA 4 ACRES: 0.62 EMBAYMENT QUANTITY (LBS) 1.39 0.46 0.46 0.46 0.46 1.39 1.39 0.46 0.46 0.46 0.46 0.46 0.46 0.46 0.93	Owner: 60 This d Reproduinformat informat Mark Mark Mark Mark Net Dat Drom B Check B Scolar Isaoo Do Sheet Ti	LU LAND DU JEFFERSON SUITE 31 TOLEDO, OH Huil & Associal TOLEDO, OH Huil & Associal Copyright 2 Description Conceptual, Desch Resummer Reserved Desch No: Construction Dead Reserved Desch Reserved Desch	AVENUE, 100 43604 d and is the s f as, Inc. he project own this drawing without here is a line. he project own this drawing without here is a line. he project own this drawing (300) 10/ (300)
etlanc nopy usatifu bstitu bstitu s sing ughou Sali Sali Sali Sali Sali Sali Sali Sali	Crategus mollis Viburnum prunifolium I indicator status based on trees shall be 1-inch calipen y based on 80 stems/acce tions may be made based le species may comprise n t respective habitat areas. TABLE 6: LIVE STAKE P RIPARIAN SCIENTIFIC NAME x discolor x interior/exigua etland indicator status base uantity based on 1742 stem batitutions may be made i bace live stakes 5-foot on c JABLOK) FOR AREA 4 - S COMMON NAME star Bulrush igrass rircian Water Plantain tarelweed ghair Sedge ged Sedge Cutgrass equin Blueflag sh Seedbox baleaf Arrowhead liock Waterparsnip	Hawthorn Blackhaw S Northcentral and North s and shrubs shall be l upon availability and d nore than 40% of habit LANTING FOR WETL SLOPE STABILIZATI COMMON NAM Pussy Willow Sandbar Willow ad on Northcentral and ns/acre based upon availability enter SUBMERGED AQUATI INDICATOR STATUS* OBL OBL OBL OBL OBL OBL OBL OBL OBL OBL	AND/WATE ON AND/WATE ON IE IN S ON Northeast L and coordin IC VEGETA DENSITY 15% 5% 5% 5% 5% 5% 5% 5% 5% 5% 5% 5% 5% 5	FACU FACU TOTAL: and USACE subreg aar seedlings. with engineer I shrubs should be r RWAY DICATOR TATUS* DICATOR TATUS* C FACW TOTAL: SDA and USACE s ation with engineer C LBS PER ACC 2.25 0.75 1.50 0.75 1.50 0.75 1.50 0.75 1.50 0.75 1.50 0.75 1.50 0.75	48 48 240 jon. andomly planted MTING AREA AREA 1 ACRES: 1.4 UUANTITY STAKES) 1220 1220 1220 2440 uubregion. PLANTIN ACRES: 0.82 WETLAND INTER- CHANNEL POOL QUANTITY (LBS) 1.84 0.61 0.61 1.23 0.61 1.23 0.61	IG AREA 4 ACRES: 0.62 EMBAYMENT QUANTITY (LBS) 1.39 0.46 0.46 0.33 0.46 1.39 0.46 0.33 0.46	Owner: 60 This d Reprodu informat Perject Mork Piot Dat Drown B Check B Scolar Issue Dr Scheck T Schect T	UN CONTRACTOR OF	AVENUE, 00 43604 d and is the s f as, Inc. he project own this drawing witcut the witch 10/ (300) 11/ (300) 11/ (301) 11/ (301) 11/ (302) 11/ (302) 11/ (302) 11/ (302) 11/ (303) 11/ (304) 11/ (304) 11/ (305) 11

								U	
				PLAN	ITING AREA		Environ	ment / Energy /	Infrastructure
WOODY STEM PLANT	TING FOR FORESTE	D WETLAN	D HABITAT		AREA 2				
			INDICATOR		3.0		219 S. Eri Toledo, OH	e Street Fax 43604 waw	: (419) 243-1881 .hullinc.com
SCIENTIFIC NAME	COMMON	NAME	STATUS*		UANTIT STEMST		Professione	al Seqi:	
r rubrum	Red Maple	in un c	FAC		30				
r saccharinum	Siver Maple		FACW		30			18 07 6	A. Mar
x nigra	Black Willow		OBL		30			AP BER	30/
anus occidentalis	American Sycar	nore	FACW		30		ł	+/ h	à de l
ricus picolor	Swamp winte C	dh	TOTA	1:	150			11000	18
nia melanocarpa	Black chokeber	ту	FAC		30			Gal Garen	2/11/
halanthus occidentali	s Buttonbush		FACW		30			XEGAN	Ehn.
nus amomum	Silky dogwood		FACW		30			" possible	
nus sericea	Red-osier dogw	rood	FAC		30			31	19120
nducus canadensis	Elderberry		TOTA	1.	150		Project Tit	ie-	
cator status based on N shall be 1-inch calipers ed on 100 stems/acre may be made based u ecies may comprise mo lanted throughout respe	lorthcentral and North and shrubs shall be b upon availability and c ore than 40% of habita cctive habitat areas.	east USDA a areroot 2-ye cordination v at, trees and	and USACE s ar seedlings. vith engineer shrubs should	ubregion.				N WETLANDS	
OODY STEM PLANTIN	IG FOR MESIC TO D	RY FORES	TED UPLAND		ITING AREA AREA 5 ACRES		WINGS	DPLAI	AIO HIO
			INDICATOR		6.0 UANTITY		N N	ЯŠ	ы с
SCIENTIFIC NAME	COMMON	NAME	STATUS*	`  ï	STEMS <sup>†</sup> )		Ľ Ľ	<u>н</u> н	Ľ
ercus rubra	Red Oak		FACU	- <u> </u> '	48		Z	ZZ	2 <u>z</u>
rcus alba	White Oak		FACU		48		2	₹ <u>0</u>	гO
odendron tulipifera	Tuliptree		FACU		48		5	AT VS	00
rcus macrocarpa	Burr Oak		FACU		48		N N	2 8	\Z S
lans nigra	Black Walnut		FACU	1.	48		μË	ŏΥ	55
alanchiar arhorea	Common Servic	eherry	FACU		48		NS	ES NT	2
cis canadensis	Redbud	coony	FACU		48		ō	<u> </u>	
ylus americana	Hazelnut		FACU		48		0	ő	
taegus mollis	Hawthorn		FACU		48	to all		Ξ	
urnum prunifolium	Blackhaw 😏	UB_	FACU		48 🗛	poorman		2	
			TOTA	L:	240			~	
shall be 1-inch calipers ed on 80 stems/acre may be made based u acies may comprise mo	and shrubs shall be b upon availability and co pre than 40% of habita	cordination v at, trees and	ar seedlings. vith engineer shrubs should	t he rando	1. 100 Div A			PEN	
pective habitat areas.					nly planted			17172	
				PLANTIN	nly planted		Owner:		
LE 6: LIVE STAKE PL RIPARIAN S	ANTING FOR WETL	AND/WATEF DN	RWAY	PLANTIN ARE ACR 1.4	AREA		Owner:	DO JEFFERSON SUITE 4	AVENUE,
LE 6: LIVE STAKE PL RIPARIAN S IENTIFIC NAME	ANTING FOR WETL SLOPE STABILIZATIK COMMON NAM	AND/WATEF DN E INC		PLANTIN ARE ACRI 1.4 QUAN	AREA		Owner:	DO JEFFERSON SUITE 30 TOLEDO, OH	AVENUE, 20 43604
LE 6: LIVE STAKE PL RIPARIAN S IENTIFIC NAME	ANTING FOR WETL SLOPE STABILIZATION COMMON NAM	AND/WATEF DN E INC S	RWAY	PLANTIN ARE ACR 1.4 QUAN (STAP	AREA A1 ES: TITY ES) 0		Owner: 6(	DO JEFFERSON SUITE 30 TOLEDO, OH	AVENUE, 00 43604
LE 6: LIVE STAKE PL RIPARIAN S IENTIFIC NAME color erior/exigua	ANTING FOR WETL SLOPE STABILIZATK COMMON NAM Pussy Willow Sandbar Willow	AND/WATEF DN E INC S	RWAY	PLANTIN ARE ACRI QUAN (STAM 122 122	My planted		Owner: 6( 	DO JEFFERSON SUITE 30 TOLEDO, OH	AVENUE, JO 43604
LE 6: LIVE STAKE PL RIPARIAN S IENTIFIC NAME color erior/exigua	ANTING FOR WETL SLOPE STABILIZATIO COMMON NAM Pussy Willow Sandbar Willow	AND/WATEF DN E INC S	RWAY DICATOR TATUS* FACW TOTAL:	PLANTIN ARE ACRI 1.4 QUAN (STAM 122 122 244	AREA A1 SS: ES) 0 0 0		Owner: 6(	D0 JEFFERSON SUITE 30 TOLEDO, OH trawing is copyrighte property Hull & Associat	AVENUE, DO 43604 td and is the sole td and is the sole td and is the sole
LE 6: LIVE STAKE PL RIPARIAN S IENTIFIC NAME color arlor/exigua d indicator status based	ANTING FOR WETL SLOPE STABILIZATIO COMMON NAM Pussy Willow Sandbar Willow	AND/WATEF DN E INE S 	RWAY DICATOR TATUS* FACW FACW TOTAL: SDA and USA	PLANTIN ARE ACRI 1.4 QUAN (STAF 122 122 244 ACE subres	Ny planted		Owner: 6( This o	D0 JEFFERSON SUITE 30 TOLEDO, OH drawing is copyright property Hull & Associat	AVENUE, DO 43604 ad and is the sole of the project owner,
LE 6: LIVE STAKE PL RIPARIAN S IENTIFIC NAME color arlon/exigua d indicator status based y based on 1742 stems tivons may be made be live stakes 5-foot on ce	ANTING FOR WETL SLOPE STABILIZATION COMMON NAM Pussy Willow Sandbar Willow I on Nothcentral and s/acre ased upon availability : nter	AND/WATEF DN E INC S Northeast U and coordina	RWAY DICATOR TATUS* FACW TOTAL: SDA and USA stion with engi	PLANTIN ARE ACR QUAN (STAH 122 122 244 ACE subres	Ny planted		Owner: 6( This of Information Preprod.	Do JEFFERSON SUITE 33 TOLEDO, OH drawing is copyright roduced for use by o don contained herei roduced for use by a don contained herei and rights rest Copyright	AVENUE, DO 43604 dato 4 dato 4
LE 6: LIVE STAKE PL RIPARIAN S IENTIFIC NAME color erior/ex/gua d indicator status based y based on 1742 stems utions may be made be jive stakes 5-foot on ce LOK) FOR AREA 4 - SU	ANTING FOR WETL SLOPE STABILIZATIO COMMON NAM Pussy Willow Sandbar Willow I on Northcentral and s/acre ased upon availability - nter	AND/WATER DN E INE S Northeast U and coordina C VEGETAT	RWAY	PLANTINI ARE ACRI QUAN (STAP 122 122 122 244 XCE subrece neer	Planted           AREA           A1           SS:           ITTY           ES)           0           0           0           0           0           0           0           0           0           0           0           0           0           0           0           0	NG AREA 4 ACRES: ACRES:	Owner: 6( This o Reprodu information per	DO JEFFERSON SUITE 31 TOLEDO, OH Hull & Associal fraving is copyright property of Hull & Associal for contained herei mission of Hull as bi All rights res- Copyright 2 Description	AVENUE, 00 446604 ed and is the sole of an i
LE 6: LIVE STAKE PL RIPARIAN S IENTIFIC NAME color arlor/exigua d Indicator status based y based on 1742 stem utions may be made ba live stakes 5-foot on ce	ANTING FOR WETL SLOPE STABILIZATIO COMMON NAM Pussy Willow Sandbar Willow I on Northcentral and s/acre ased upon availability nter	AND/WATEF DN E INE S 	ICATOR TATUS FACW TOTAL: SDA and USA tion with engi	PLANTIN ARE ACR QUAN (STAH 122 122 244 ACE subres neer	B AREA         1           3 AREA         1           3 ITTY         55:           5         1           1TTY         ES)           0         0           0         0           ion.         0	IG AREA 4 ACRES: 0.62	Owner: 60 This c Reprodu informa per	Do JEFFERSON SUITE 31 TOLEDO, OH drawing is copyright property Hull & Associat roduced for us as fon contained hereis mission of Hull is st All rights resu Copyright 2 Description CONCEPTUL DESIGN	AVENUE, 00 445604 445604 445604 445604 445604 445604 445604 445604 445604 445604 445604 45604
LE 6: LIVE STAKE PL RIPARIAN S IENTIFIC NAME color erlor/exigua d indicator status based y based on 1742 stems utions may be made ba live stakes 5-foot on ce live stakes 5-foot on ce	ANTING FOR WETL SLOPE STABILIZATION COMMON NAM Pussy Willow Sandbar Willow I on Nothcentral and sfacre ased upon availability inter JBMERGED AQUATION INDICATOR STATUS*	AND/WATER DN E INC S Northeast U and coordina C VEGETAT DENSITY	ICATOR TATUS* FACW TOTAL: SDA and USA tion with engi	PLANTIN' ARE ACR: ULANTIN' (STAF 122 244 244 244 244 244 244 244 244 244	AREA AT SS: ES: ES) 0 0 0 0 0 0 0 0 0 0 0 0 0	NG AREA 4 ACRES: 0.62 EMBAYMENT QUANTITY (LBS)	Owner: 6( This c Peppod informal per	DO JEFFERSON SUITE 31 TOLEDO, OH drawing is copyright property of Hull & Associat copyright 2 Description CONCEPTUAL DESIGN SCHEMATE DESCH PRE_TRAUL DESIGN CONSTRUCTION DEAD	AVENUE, 00 43604 43604 ad and is the sole M ad ad a
LE 6: LIVE STAKE PL RIPARIAN S IENTIFIC NAME color erior/exigua d indicator status based y based on 1742 stems utions may be made ba live stakes 5-foot on ce ive stakes 5-foot on ce COMMON NAME it Bur-Reed	ANTING FOR WETL SLOPE STABILIZATION COMMON NAM Pussy Willow Sandbar Willow i on Nothcentral and s/acre ased upon availability inter JBMERGED AQUATION INDICATOR STATUS* OBL	AND/WATER DN E INC S Northeast U and coordina C VEGETAT DENSITY 15%	RWAY	PLANTIN ARE ARE ACRI UJAN (STAV 122 122 122 122 122 122 122 122 122 12	AREA A1 SS: ES) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	NG AREA 4 ACRES: 0.62 EMBAYMENT QUANTITY (LBS) 1.39	Owner: 6( This c Reproma shore per	DO JEFFERSON SUITE 31 TOLEDO, OH drawing is copyright property Hull & Associat roduced for sub sy to characterized association of Hull as the Copyright 2 Description CONCEPTUAL DESIGN PRELIMINARY DESIGN PRELIMINARY DESIGN CONSTRUCTION DRAN CONSTRUCTION DRAN	AVENUE, 00 43604 as and is the sole as and is the sole as and is the sole as a lnc. the project owner this drawing or the without the without the writed 10/29/19 (sox) 11/12/19 (sox) 11/12/19 (sox) 11/12/19 (sox) 11/12/19 (sox) 21/20/19 (sox) 21/20/19
LE 6: LIVE STAKE PL RIPARIAN S IENTIFIC NAME color artor/exigua d Indicator status based y based on 1742 stems utions may be made be itive stakes 5-foot on ce OK) FOR AREA 4 - SL COMMON NAME it Bur-Reed Bulrush	ANTING FOR WETLI SLOPE STABILIZATIO COMMON NAM Pussy Willow Sandbar Willow I on Northcentral and s/acre ased upon availability inter JBMERGED AQUATION INDICATOR STATUS* OBL OBL	AND/WATEF DN E INC S Northeast U and coordina C VEGETAT DENSITY 15% 5%	RWAY DICATOR TATUS* FACW TOTAL: SDA and USA ation with engineration TION FOR PO LBS PE 2.: 0.	PLANTIN ARE ACR 1. UJAN (STAP 122 244 XCE subrece ND R ACRE 25 75 75	nly planted  3 AREA A1 55: 57: 57: 50: 50: 50: 50: 50: 50: 50: 50: 50: 50	NG AREA 4 ACRES: 0.62 EMBAYMENT QUANTITY (LBS) 1.39 0.46	Owner: 6( This of Information Information Project	DO JEFFERSON SUITE 31 TOLEDO, OH drawing is copyright property of Hull & Associal of contained herei mission of Hull set All rights rest Copyright 2 Description CONCEPTUAL DESIGN PRELIMINARY DESIGN PRE-FINAL DESIGN PRE-FINAL DESIGN FINAL DESIGN (1022 CONSTRUCTION DRAW PRE-FINAL DESIGN PRE-FINAL	AVENUE, 00 43604 d and is the sole of des, Inc. he project owner this drawing or the without the without the virtual the without 10/29/19 (300) 11/12/19 (300) 11/12/19 (300) 11/30/20 0 02/21/20 0 00 0
LE 6: LIVE STAKE PL RIPARIAN S IENTIFIC NAME color erior/exigua d indicator status based y based on 1742 stems utions may be made be live stakes 5-foot on ce LOK) FOR AREA 4 - SL COMMON NAME it Bur-Reed Bulrush is Mater Blachel	ANTING FOR WETL SLOPE STABILIZATIO COMMON NAM Pussy Willow Sandbar Willow I on Northcentral and s/acre ased upon availability - nter JBMERGED AQUATION INDICATOR STATUS* OBL OBL OBL	AND/WATEF N E INE S Northeast U and coordina C VEGETAT DENSITY 15% 5% 5% 5%	INTERPORT	PLANTIN ARE ACR 1. QUAN (STAY 122 244 22 244 22 244 24 24 24 24 24 24 2	PLANTII AREA A1 SS: ES) 0 0 0 0 0 0 0 0 0 0 0 0 0	NG AREA 4 ACRES: 0.62 EMBAYMENT QUANTITY (LBS) 1.39 0.46 0.46 0.46	Owner: 6( This o Reprodu- Information Periodect Mark Project Pict Det Laceat	D0 JEFFERSON SUITE 31 TOLEDO, OH drawing is copyright property of Hull & Associal froduced for use by to constrained herei mission of Hull as bi All rights rest Copyright 2 Description CONCEPTUAL DESCA PRELIMINARY DESCA PRELIMIN	AVENUE, 00 43604 d and is the sole of the adawing or the hep project owner this drawing or the without the without the without the without without the without 10/29/19 10/29/19 10/29/19 10/29/19 000 10/29/19 000 10/22/19 000 01/12/19 000 000 000 000 000 000 000 0
LE 6: LIVE STAKE PL RIPARIAN S IENTIFIC NAME color artor/ex/gua d indicator status based y based on 1742 stems utions may be made ba live stakes 5-foot on ce ive stakes 5-foot on ce COMMON NAME it Bur-Reed Bulrush is Water Plantain werd	ANTING FOR WETLI SLOPE STABILIZATIO COMMON NAM Pussy Willow Sandbar Willow a on Northcentral and s/acre ased upon availability inter JBMERGED AQUATION JBMERGED AQUATION INDICATOR STATUS* OBL OBL OBL OBL	AND/WATEF DN E INE Northeast U and coordina C VEGETAT DENSITY 15% 5% 5% 5%	ION FOR PO	PLANTIN ARE ARE ARE ARE 11 UUAN (STAF 122 244 XCE subrec neer ND R ACRE 25 75 75 75 55	PLANTII AREA A1 SS: ES) 0 0 0 0 0 0 0 0 0 0 0 0 0	NG AREA 4 ACRES: 0.62 EMBAYMENT QUANTITY (LBS) 1.39 0.46 0.46 0.46 0.93	Owner: 6( This of Reprodu- information Per Mark Project Pat Dat Dorom E	D0 JEFFERSON SUITE 31 TOLEDO, OH trawing is copyright property of Hull & Associal for contained hereis mission of Hull as to conceptual. Design Conceptual. Design Conceptual. Design PRELIMINARY DESIGN FRELIMINARY DESIGN FRELIMINARY DESIGN FRELIMINARY DESIGN FRELIMINARY DESIGN FRELIMINARY DESIGN FINAL DESIGN (1000 CONSTRUCTION DRAY CONSTRUCTION DRAY Design (1000 CONSTRUCTION DRAY	AVENUE, 00 44604 d and is the sole of this drawing or the project owner this drawing or the without the written to yread 10/29/19 10/29/19 10/29/19 10/29/19 00 00 00 01/30/20 00 02/21/20 00 03 1/20 /20 /20
LE 6: LIVE STAKE PL RIPARIAN S IENTIFIC NAME color erior/exigua d indicator status based y based on 1742 stems utions may be made ba live stakes 5-foot on ce live stakes 5-foot on ce common NAME common NAME it Bur-Reed Bulrush is n Water Plantain weed Sedge	ANTING FOR WETL SLOPE STABILIZATIO COMMON NAM Pussy Willow Sandbar Willow I on Northcentral and s/acre ased upon availability inter I BMERGED AQUATION I INDICATOR STATUS* OBL OBL OBL OBL OBL OBL OBL OBL	AND/WATEF DN E INE S Northeast U and coordina C VEGETAT DENSITY 15% 5% 5% 5% 5% 5%	ION FOR PO	PLANTIN' ARE ACR: UJAN (STAA 122 244 244 244 244 244 244 244 244 244	PLANTII AREA A1 S3 AREA A1 S3: S3: S4: A1 CHANTII ACRES: 0.82 0 0 0 0 0 0 0 0 0 0 0 0 0	NG AREA 4 ACRES: 0.62 EMBAYMENT QUANTITY (LBS) 1.39 0.46 0.46 0.46 0.93 0.46	Owner: 6( This c Reprodu- informat per Mort Project Pot Det Layout Layout Drom E	D0 JEFFERSON SUITE 31 TOLEDO, OH drawing is copyright property of Hull & Associal fon contained hereit mission of Hull as the All rights res Copyright 2 Description CONCEPTUAL DESIGN FRE-TNAL DESIGN FRE-TNAL DESIGN FRE-TNAL DESIGN FINAL DESIGN (1000 CONSTRUCTION DRA DESIGN (10000 CONSTRUCTION DRA DESIGN (	AVENUE, 00 445604 445604 445604 445604 445604 445604 445604 445604 445604 445604 445604 445604 45604
LE 6: LIVE STAKE PL RIPARIAN S IENTIFIC NAME color erlor/exigua d indicator status based y based on 1742 stem utions may be made ba ive stakes 5-foot on ce ive stakes 5-foot on ce common NAME common NAME it Bur-Reed Bulrush is t Bur-Reed Bulrush is Sedge Sedge	ANTING FOR WETL SLOPE STABILIZATION COMMON NAM Pussy Willow Sandbar Willow I on Northcentral and sed upon availability ased upon availability ased upon availability ased upon availability ased upon availability INDICATOR STATUS* OBL OBL OBL OBL OBL OBL OBL OBL OBL	AND/WATEF DN E INE S Northeast U and coordina C VEGETAT DENSITY 15% 5% 5% 5% 10% 5%	ION FOR PO	PLANTIN' ARE ACR: UUAN (STAF 122 244 (STAF 122 244 CCE subred neer R ACRE 25 75 75 75 75 55 55 75 75 75 75 75 75 75	PLANTII AREA A1 SS: ES: ES) 0 0 0 0 0 0 0 0 0 0 0 0 0	NG AREA 4 ACRES: 0.62 EMBAYMENT QUANTITY (LBS) 1.39 0.46 0.46 0.46 0.93 0.46 1.39	Owner: 6( This of It is provided information information per Notes Project Project Project Project Project Scole	ODU JEFFERSON SUITE 31 TOLEDO, OH drawing is copyright property Hull & Associat roduced for uses by Copyright 2 Description CONCEPTUAL DESCH SCHEMAL DESCH SCHEMAL DESCH CONSTRUCTION DRAW	AVENUE, 00 445604 d and is the sole of metal and is the sole of t
LE 6: LIVE STAKE PL RIPARIAN S IENTIFIC NAME color antor/exigua d indicator status based y based on 1742 stems utions may be made be live stakes 5-foot on ce COK) FOR AREA 4 - SL COMMON NAME it Bur-Reed Bulrush Bulrush SS Vater Plantain weed Sedge Sedge grass	ANTING FOR WETL SLOPE STABILIZATION COMMON NAM Pussy Willow Sandbar Willow andbar Willow I on Nothcentral and sead upon availability of the and the state of the state of the state sead upon availability of the state sead upon availability of the	AND/WATEF DN E INC S Northeast U and coordina C VEGETAT DENSITY 15% 5% 5% 5% 5% 5% 5% 5% 5% 5%	RWAY	PLANTIN ARE ARE ACR: 122 122 122 122 122 122 122 122 122 12	nly planted  3 AREA A1 SS: FITY ES) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	NG AREA 4 ACRES: 0.62 EMBAYMENT QUANTITY (LBS) 1.39 0.46 0.46 0.46 0.46 0.46 1.39 1.39 1.39	Owner: 6( This c Reformation R	CONSTRUCTION DEVALUATION DEVAL	AVENUE, 00 43604 ad and is the sole ad ad ad ad and is ad ad ad ad ad a
LE 6: LIVE STAKE PL RIPARIAN S IENTIFIC NAME color erior/exigua d Indicator status based y based on 1742 stems utions may be made be itive stakes 5-foot on ce COK) FOR AREA 4 - SL COMMON NAME it Bur-Reed Bulrush is t Water Plantain weed Sedge Sedge grass n Blueflag	ANTING FOR WETL SLOPE STABILIZATIO COMMON NAM Pussy Willow Sandbar Willow Jon Northcentral and s/acre ased upon availability - nter JBMERGED AQUATION INDICATOR STATUS* OBL OBL OBL OBL OBL OBL OBL OBL OBL	AND/WATEF DN E INC S' Northeast U and coordina C VEGETAT DENSITY 15% 5% 5% 5% 5%	ION FOR PO	PLANTIN ARE ACR 1. QUAN (STAP 122 244 VCE subres 244 CCE subres 244 CCE subres 244 CCE subres 244 CCE subres 25 75 75 50 75 55 50 75 55 52 52 52 52 52 52 52 52 52 52 52 52	Planted  AT  AT  SAREA  AT  ES  D  D  D  D  D  D  D  D  D  D  D  D  D	VG AREA 4 ACRES: 0.62 EMBAYMENT QUANTITY (LBS) 1.39 0.46 0.46 0.46 0.33 0.46 1.39 1.39 1.39	Owner: 6( This of Project Project Project Drom E Check E Scole: Insoc D Sheet Ti	DO JEFFERSON SUITE 31 TOLEDO, OH drawing is copyright property of Hull & Associal reduced for use by action or other use of taking the set for contained herei mission of Hull as to concerption Concerptual. Design Presumawa Presumawa Description CONCEPTUAL DESIGN PRE-TRAL DESIGN PRE-TRA	AVENUE, 00 43604 d and is the sole of this drawing or the hep roject owner this drawing or the without the without 10/29/19 (303) 11/12/19 (303) 11/12/19 (303) 11/12/19 (303) 01/30/20 0.02/21/20 IMNCS 02/28/20 
LE 6: LIVE STAKE PL RIPARIAN S IENTIFIC NAME color artor/ex/gua d indicator status based y based on 1742 stems utions may be made be jive stakes 5-foot on ce COMMON NAME it Bur-Reed Bulrush is t Bur-Reed Bulrush is sedge Sedge Sedge Sedge arass in Blueflag eedbox	ANTING FOR WETLI SLOPE STABILIZATIO COMMON NAM Pussy Willow Sandbar Willow a on Northcentral and s/acre ased upon availability inter JBMERGED AQUATION JBMERGED AQUATION JBMER	AND/WATEF DN E INE Northeast U and coordina C VEGETAT DENSITY 15% 5% 5% 5% 5% 5%	ION FOR PO	PLANTIN' ARE ARE ARE 11 QUAN (STAV 122 244 XCE subre; neer ND R ACRE 25 75 75 75 75 75 75 75 75 75 75	nly planted	NG AREA 4 ACRES: 0.62 EMBAYMENT QUANTITY (LBS) 1.39 0.46 0.46 0.93 0.46 1.39 0.46 1.39 0.46 1.39 0.46	Owner: 6( This of Reprodu- information Period Mark Project Pict Dat Upyout 1 Drown 1 Scale Isaoo D Sheet Ti	DO JEFFERSON SUITE 31 TOLEDO, OH trawing is copyright property of Hull & Associal froduced for use by totion or other use of top contained hereis mission of Hull set All rights res- Copyright 2 Description CONCEPTUAL DESIGN FRELMANKY DESIGN FRE	AVENUE, 00 44604 d and is the sole of es, Inc. he project owner this drawing or the without the writen toty prohibited project owner this drawing or the project owner this drawing owner this d
LE 6: LIVE STAKE PL RIPARIAN S IENTIFIC NAME color anton/ex/gua d indicator status based y based on 1742 stems utions may be made ba live stakes 5-foot on ce live stakes 5-foot on ce cok) FOR AREA 4 - SL COMMON NAME it Bur-Reed Bulrush Surves Bulrush Sage Sedge Sedge grass n Blueflag seedbox f Arrowhead	ANTING FOR WETL SLOPE STABILIZATIO COMMON NAM Pussy Willow Sandbar Willow I on Northcentral and s/acre ased upon availability ased upon a	AND/WATEF DN E INE Solution Northeast U and coordina C VEGETAT DENSITY 15% 5% 5% 15% 5% 15% 5%	ICATOR TATUS' FACW TOTAL: SDA and USA tion with engi ION FOR PO LBS PE 2.: 0. 0. 0. 0. 2.: 2.: 0. 0. 0. 0. 1. 1. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.	PLANTIN' ARE ARE ACR. QUAN (STAA 122 244 122 244 122 244 122 244 122 244 122 244 122 244 122 25 175 15 15 15 15 15 15 15 15 15 15 15 15 15	PLANTII AREA A1 S3 AREA A1 S5: S5: S5: S7: ACRES: 0 0 0 0 0 0 0 0 0 0 0 0 0	NG AREA 4 ACRES: 0.62 EMBAYMENT QUANTITY (LBS) 1.39 0.46 0.46 0.46 0.93 1.39 1.39 1.39 0.46 0.46 0.46 0.46 0.46 0.46 0.46 0.46	Owner: 6( This c Reprodu- informal per Mort Project Layout I Drome E Cocket T State T	D0 JEFFERSON SUITE 31 TOLEDO, OH trawing is copyright property of Hull & Associat is copyright 2 Description CONCEPTUAL DESIGN CONCEPTUAL DESIGN CONCEPTUAL DESIGN FRELIMINARY DESIGN FRELIMINARY DESIGN FRELIMINARY DESIGN CONSTRUCTION DRA DESIGN (1000 CONSTRUCTION DRA DESIGN (1	AVENUE, 00 445604 dand is the sole of the project owner this drawing or the project owner the project owner the projec
LE 6: LIVE STAKE PL RIPARIAN S IENTIFIC NAME color arlor/exigua d indicator status based y based on 1742 stems utions may be made ba live stakes 5-foot on ce live stakes 5-foot on ce coky FOR AREA 4 - SL COMMON NAME it Bur-Reed Bulrush is a n Water Plantain weed Sedge grass n Blueflag eedbox f Arrowhead Waterparsnip	ANTING FOR WETL SLOPE STABILIZATION COMMON NAM Pussy Willow Sandbar Willow I on Northcentral and s/acre ased upon availability of slamer JBMERGED AQUATION INDICATOR STATUS* OBL OBL OBL OBL OBL OBL OBL OBL OBL OBL	AND/WATEF DN E INC S Northeast U and coordina C VEGETAT DENSITY 15% 5% 5% 10% 5% 5% 15% 5% 15% 5% 15% 5% 10%	ION FOR PO	PLANTIN' ARE ACR: UUAN (STAA (STAA 122 244 XCE subred neer ND R ACRE 25 75 75 75 75 75 75 75 75 75 75 75 75 75	PLANTII AREA A1 SS: ES: D 0 0 0 0 0 0 0 0 0 0 0 0 0	NG AREA 4 ACRES: 0.62 EMBAYMENT QUANTITY (LBS) 1.39 0.46 0.46 0.46 0.46 0.46 1.39 1.39 0.46 1.39 0.46 0.46 0.46 0.43 0.46 0.46 0.93 0.46 0.93 0.46 0.93 0.46	Owner: 6( This of Perpending information per Notes Project Pot bot Drown E Societ Isaso D Sheet T	DOU JEFFERSON SUITE 31 TOLEDO, OH drawing is copyright property of the Associal control of the rate of the Associal control of the Association control of the Asso	AVENUE, 00 445604 dand is the sole of the dawing or the period of the sole of the dawing or the period of the the dawing or the the daw
	Inus occidentalis reus bicolor ila melanocarpa valanthus occidentali us amonum lus sericea bucus canadensis ator status based on N shall be 1-inch calipers ad on 100 stems/acre and throughout respe DODY STEM PLANTIN SCIENTIFIC NAME CRUS rubra reus alba idendron tulipifera reus macrocarpa ans nigra vanchier arborea is canadensis dus americana agus mollis urum prunifolium ator status based on N shall be 1-inch calipers ad on Stems/acre may be made based to cices may comprise mo	Inus occidentalis American Sycar rcus bicolor Swamp White C ila melanocarpa Black chokeber ila melanocarpa Black chokeber ila melanocarpa Black chokeber ila melanocarpa Black chokeber is amomum Silky dogwood us sericea Red-osler dogw bucus canadensis Elderberry ator status based on Northcentral and North shall be 1-inch calipers and shrubs shall be b ad on 100 stems/acre may be made based upon availability and o cise may comprise more than 40% of habita anted throughout respective habitat areas. DODY STEM PLANTING FOR MESIC TO D SCIENTIFIC NAME COMMON rcus rubra Red Oak rcus alba White Oak dendron tullpifera Tulliptree rcus macrocarpa Burr Oak ans nigra Black Walnut ilanchier arborea Common Servic is canadensis Redbud rlus americana Hazelnut aegus mollis Hawthorn and based on Northcentral and North shall be 1-inch calipers and shrubs shall be b ad on 80 stems/acre	nuus occidentalis       American sycamore         rcus bicolor       Swamp White Oak         ia melanocarpa       Black chokeberry         ialantus occidentalis       Buttonbush         us amonum       Silky dogwood         uus amonum       Silky dogwood         uus amonum       Silky dogwood         uus amonum       Silky dogwood         ator status based on Northcentral and Northeast USDA         shall be 1-inch calipers and shrubs shall be barerool 2-ye         ad on 100 stems/acre         may be made based upon avaitability and coordination v         ciss may comprise more than 40% of habitat, trees and         anted throughout respective habitat areas.         DODY STEM PLANTING FOR MESIC TO DRY FORES'         SCIENTIFIC NAME       COMMON NAME         rcus alba       White Oak         diendron tulipifera       Tuliptree         rcus macrocarpa       Burr Oak         ans nigra       Black Walnut         via americana       Hazelnut         agus molis       Hawthorn         urum prunifolium       Blackhaw         via samericana       Hazelnut         agus nolis       Hawthorn         urum prunifolium       Blackhaw         via samericana	nuts occidentalis       American Sycamore       FACW         rcus bicolor       Swamp White Oak       FACW         ia melanocarpa       Black chokeberry       FAC         ia melanocarpa       Black chokeberry       FACW         was amonum       Silky dogwood       FACW         us sericea       Red-osier dogwood       FAC         bucus canadensis       Elderberry       FACW         ator status based on Northcentral and Northeast USDA and USACE s       shall be 1-inch calipers and shrubs shall be bareroot 2-year seedlings.         ad on 100 stems/ace       may be made based upon availability and coordination with engineer         cise may comprise more than 40% of habitat, trees and shrubs should       anted throughout respective habitat areas.         DODY STEM PLANTING FOR MESIC TO DRY FORESTED UPLANE       INDICATOR         SCIENTIFIC NAME       COMMON NAME       STATUS*         recus rubra       Red Oak       FACU         rus alba       White Oak       FACU         rus macrocarpa       Burr Oak       FACU         rus marcarana       Redbud       FACU         rus rubra       Redbud       FACU         rus rubra       Red Oak       FACU         scientrific NAME       COMMON NAME       STATUS*	nuus occidentalis       American Sycamore       PAL-W         rcus bicolor       Swamp White Oak       FACW         ia melanocarpa       Black chokeberry       FAC         ia melanocarpa       Black chokeberry       FAC         ia anthus occidentalis       Buttonbush       FACW         us amonum       Silky dogwood       FACW         uus sericea       Red-osier dogwood       FAC         bucus canadensis       Elderberry       FACW         ator status based on Northcentral and Northeast USDA and USACE subregion.       shall be 1-inch calipers and shubs shall be barerool 2-year seedlings.         ad on 100 stems/acre       may be made based upon availability and coordination with engineer       cise may comprise more than 40% of habitat, trees and shubs should anted throughout respective habitat areas.         DODY STEM PLANTING FOR MESIC TO DRY FORESTED UPLAND       INDICATOR       Q         SCIENTIFIC NAME       COMMON NAME       STATUS* (group and and shub for a facu areas.         DODY STEM PLANTING FOR MESIC TO DRY FORESTED UPLAND       Indicator areas         Cruss rubra       Red Oak       FACU         rcus matrocarpa       Bur Oak       FACU         cruss nationa       Red Oak       FACU         cruss nationa       Red Oak       FACU         cruss mationa <td>Inus occidentalis       American Sycamore       FAC.W       Ju         rcus bicolor       Swamp White Oak       FACW       30         ia melanocama       Black chokeberry       FAC       30         ia melanocama       Black chokeberry       FAC       30         ia melanocama       Black chokeberry       FAC       30         ia anthus occidentalis       Buttonbush       FACW       30         us sericea       Red-osier dogwood       FACW       30         bucus canadensis       Elderberry       FACW       30         bucus canadensis       Elderberry       FACW       30         ator status based on Northcentral and Northeast USDA and USACE subregion.       shalb be 1-inch calipers and shrubs shall be barerool 2-year seedlings.         ad on 100 stems/ace       may be made based upon availability and coordination with engineer cise may comprise more than 40% of habitat, trees and shrubs should anted throughout respective habitat areas.         DODY STEM PLANTING FOR MESIC TO DRY FORESTED UPLAND       AREA 5         SciENTIFIC NAME       COMMON NAME       STATUS'         SCIENTIFIC NAME       COMMON NAME       STATUS'         crus rubra       Red Oak       FACU       48         crus rubra       Red Oak       FACU       48</td> <td>nuss accidentalis       American Sysamore       FACW       30         reus bicolor       Swamp White Oak       FACW       30         ia melanocarpa       Black chokeberry       FAC       30         haianthus occidentalis       Butchobush       FACW       30         uss amomum       Silky dogwood       FACW       30         uss amomum       Silky dogwood       FACW       30         uss arcour       TOTAL:       150         ator status based on Northcentral and Northeast USDA and USACE subregion.       shall be 1-inch calipers and shrubs shall be barerool 2-year seedlings.         ad on 100 stems/acre       may be made based upon avalability and coordination with engineer       cleas may comprise more than 40% of habitat, trees and shrubs should anted throughout respective habitat areas.         DODY STEM PLANTING FOR MESIC TO DRY FORESTED UPLAND       AREA 5         ACRES       6.0         SCIENTIFIC NAME       COMMON NAME         STATUS*       (STEMS<sup>1</sup>)         recus alba       White Oak         FACU       48         denoton tulipifera       TUIpitree         rcus macrocarpa       Burr Oak       FACU         as rs rigra       Black Walnut       FACU         is canadensis       Redbud       FACU</td> <td>nrus accidentalis       American Sycamore       FACW       30         reus bicolor       Swamp White Oak       FACW       30         ia melanocarpa       Black chokebery       FAC       30         halanthus occidentalis       Buttohbush       FACW       30         us armonum       Silky dogwood       FACW       30         us armonum       Silky dogwood       FACW       30         bucus canadensis       Elderberry       FACW       30         ator status based on Northcentral and Notheast USDA and USACE subregion.       shall be 1-inch calipers and shrubs shall be bareroot 2-year seedlings.         ad on 100 stems/acre       may be made based upon availability and coordination with engineer       cises may comprise more than 40% of habitat, trees and shrubs should anted throughout respective habitat areas.         DODY STEM PLANTING FOR MESIC TO DRY FORESTED UPLAND       ARCRES 6.0       0         SCIENTIFIC NAME       COMMON NAME       STATUS*       (STEMS<sup>1</sup>)         scient rubra       Red Oak       FACU       48         rcus rubra       Red Oak       FACU</td> <td>nus accidentalis       American Sycamore       FACW       30         rous bicolor       Swamp White Oak       FACW       30         ia melanocarpa       Black chokeberry       FAC       30         ia melanocarpa       Black chokeberry       FAC       30         us sarcea       Red-osier dogwood       FACW       30         us sarcea       Red-osier dogwood       FACW       30         bicus canadensis       Elderbarry       FACW       30         bicus canadensis       Elderbarry       FACW       30         bicus canadensis       Elderbarry       FACW       30         ator status based on Nothcentral and Notheast USDA and USACE subregion.       shale b 1-tho. calpers and shhubs shall be harroot 2-year seedlings.         ad on 100 stems/acre       may be made based upon availability and coordination with engineer       6.0         cis may comprise more than 40% of habitat trees and shubs should anted throughout respective habitat areas.       ACRES         SCIENTIFIC NAME       COMMON NAME       FACU       48         is canadensis       Redbud       FACU       48         is canadensis       Redbud       FACU       48         is canadensis       Redbud       FACU       48         is canadensis</td>	Inus occidentalis       American Sycamore       FAC.W       Ju         rcus bicolor       Swamp White Oak       FACW       30         ia melanocama       Black chokeberry       FAC       30         ia melanocama       Black chokeberry       FAC       30         ia melanocama       Black chokeberry       FAC       30         ia anthus occidentalis       Buttonbush       FACW       30         us sericea       Red-osier dogwood       FACW       30         bucus canadensis       Elderberry       FACW       30         bucus canadensis       Elderberry       FACW       30         ator status based on Northcentral and Northeast USDA and USACE subregion.       shalb be 1-inch calipers and shrubs shall be barerool 2-year seedlings.         ad on 100 stems/ace       may be made based upon availability and coordination with engineer cise may comprise more than 40% of habitat, trees and shrubs should anted throughout respective habitat areas.         DODY STEM PLANTING FOR MESIC TO DRY FORESTED UPLAND       AREA 5         SciENTIFIC NAME       COMMON NAME       STATUS'         SCIENTIFIC NAME       COMMON NAME       STATUS'         crus rubra       Red Oak       FACU       48         crus rubra       Red Oak       FACU       48	nuss accidentalis       American Sysamore       FACW       30         reus bicolor       Swamp White Oak       FACW       30         ia melanocarpa       Black chokeberry       FAC       30         haianthus occidentalis       Butchobush       FACW       30         uss amomum       Silky dogwood       FACW       30         uss amomum       Silky dogwood       FACW       30         uss arcour       TOTAL:       150         ator status based on Northcentral and Northeast USDA and USACE subregion.       shall be 1-inch calipers and shrubs shall be barerool 2-year seedlings.         ad on 100 stems/acre       may be made based upon avalability and coordination with engineer       cleas may comprise more than 40% of habitat, trees and shrubs should anted throughout respective habitat areas.         DODY STEM PLANTING FOR MESIC TO DRY FORESTED UPLAND       AREA 5         ACRES       6.0         SCIENTIFIC NAME       COMMON NAME         STATUS*       (STEMS <sup>1</sup> )         recus alba       White Oak         FACU       48         denoton tulipifera       TUIpitree         rcus macrocarpa       Burr Oak       FACU         as rs rigra       Black Walnut       FACU         is canadensis       Redbud       FACU	nrus accidentalis       American Sycamore       FACW       30         reus bicolor       Swamp White Oak       FACW       30         ia melanocarpa       Black chokebery       FAC       30         halanthus occidentalis       Buttohbush       FACW       30         us armonum       Silky dogwood       FACW       30         us armonum       Silky dogwood       FACW       30         bucus canadensis       Elderberry       FACW       30         ator status based on Northcentral and Notheast USDA and USACE subregion.       shall be 1-inch calipers and shrubs shall be bareroot 2-year seedlings.         ad on 100 stems/acre       may be made based upon availability and coordination with engineer       cises may comprise more than 40% of habitat, trees and shrubs should anted throughout respective habitat areas.         DODY STEM PLANTING FOR MESIC TO DRY FORESTED UPLAND       ARCRES 6.0       0         SCIENTIFIC NAME       COMMON NAME       STATUS*       (STEMS <sup>1</sup> )         scient rubra       Red Oak       FACU       48         rcus rubra       Red Oak       FACU	nus accidentalis       American Sycamore       FACW       30         rous bicolor       Swamp White Oak       FACW       30         ia melanocarpa       Black chokeberry       FAC       30         ia melanocarpa       Black chokeberry       FAC       30         us sarcea       Red-osier dogwood       FACW       30         us sarcea       Red-osier dogwood       FACW       30         bicus canadensis       Elderbarry       FACW       30         bicus canadensis       Elderbarry       FACW       30         bicus canadensis       Elderbarry       FACW       30         ator status based on Nothcentral and Notheast USDA and USACE subregion.       shale b 1-tho. calpers and shhubs shall be harroot 2-year seedlings.         ad on 100 stems/acre       may be made based upon availability and coordination with engineer       6.0         cis may comprise more than 40% of habitat trees and shubs should anted throughout respective habitat areas.       ACRES         SCIENTIFIC NAME       COMMON NAME       FACU       48         is canadensis       Redbud       FACU       48         is canadensis       Redbud       FACU       48         is canadensis       Redbud       FACU       48         is canadensis

a palustris ia latifolia lave	Broa Hem	lock Waterparsnip	OBL	5% 100%	0.	.75	0.61	0.46	PI	ANTING N	IOTES &
a palustris ia latifolia	Broa	Idleaf Arrownead	OBI	5%	0	.75	0.61	0.46		ANTINO	
a palustris	D			1070	1.	und l					
	Mars	sh Seedbox	OBL	5%	0.	.75	0.61	0.46			
icolor	Harl	equin Blueflag	OBL	5%	0.	.75	0.61	0.46	Sheet Title	£	
oryzoides	Rice	Cutgrass	OBL	15%	2.	.25	1.84	1.39	Issue Date	r: WARC	H 2020
inita	Frin	ged Sedge	OBL	15%	2.	25	1.84	1.39	Scala:	AS N	OTED
omosa	Lon	ahair Sedge	OBL	5%	1.	.75	0.61	0.46	Check By:	PAH	(JHH
subcordatum	Ame	rican Water Plantain	OBL	5%	0.	50	0.61	0.40	Drmen Per	CHS	/sah
cyperinus	Woo	Igrass	OBL	5%	0.	.75	0.61	0.46	Plot Date:	3/10	/20
oplectus tabernaemonta	ani Soft	stem Bulrush	OBL	5%	0.	.75	0.61	0.46	Project No	L: COT3	03
nium eurycarpum	Broa	dfruit Bur-Reed	OBL	15%	2.	.25	1.84	1.39			
		COMMON NAME	STATUS*	DENOT			QUANTITY (LBS)	(LBS)	-		
SCIENTIFIC NAME		COMMON NAME	INDICATOR	DENSIT		RACRE	CHANNEL POOL	EMBAYMENT QUANTITY		NAL DESIGN (1007	() 02 MNGS 02
							WETI AND INTED		50	RE-FINAL DESIGN	(90%) 01
TERS.							ACRES: 0.82	0.62	Př	CHEMINARY DESIGN	(30%) 11
7: SEED MIX (SUBMER	SEED-AQU	JABLOK) FOR AREA 4 - SI	JBMERGED AQUAT	IC VEGETA	ATION FOR PO	ND -	PLANTI	NG AREA 4	C C	INCEPTUAL DESIGN	(107)
			10. second and a second						MARK DO		
									Heret Do	rectation	
	- Sp	bace live stakes 5-foot on ce	nter							All rights rese Copyright 2	erved 020
	- St	ubstitutions may be made be	ased upon availability	and coordin	nation with engi	ineer			permi	ission of Hull is st	ictly prohibit
	- QI	uantity based on 1742 stem	s/acre				eren (freezen)		Reproduct	ion or other use of n contained herei	f this drawing without the
	*w	etland indicator status based	t on Northcentral and	l Northeast	USDA and USA	ACE subreak	on.		It is pro-	duced for use by f	he project ou
	Sali	x interior/exigua	Sandbar Willow		TOTAL	1220	<u>'</u>			property o	a es loc
	Sali	x discolor	Pussy Willow		FACW	1220			This dra	wing is copyrighte	ed and is the
		SCIENTIFIC NAME	COMMON NAM	mC	STATUS*	(STAKE	ES)			IULEDO, OH	43604
		SCIENTIEIC NAME	COMMON NAM		DICATOR	QUANT	πү			SUITE 30	00
		KIPARIAN	SLUPE STABILIZAT	NUN	ſ	ACRES	S:		600	JEFFERSON	AVENUE
		TABLE 6: LIVE STAKE PL	ANTING FOR WETL	LAND/WATE	ERWAY	AREA	1			A Lance	9°
	[					PLANTING	AREA			V	e O
			Second Second Second							-	
	- NO singl throughou	e species may comprise mo t respective habitat areas.	bie than 40% of habi	ildi, trees an	iu shruds shouk	u de random	пу ріанцео		Owner:	C. THE	8
	- Substitu	tions may be made based u	upon availability and	coordination	with engineer		to standard			۵.	
	Canopy	trees shall be 1-inch calipers	and shrubs shall be	bareroot 2-y	year seedlings.					EN	
3	* Wetland	I indicator status based on N	lorthcentral and North	heast USDA	A and USACE s	subregion.				Z	
					TOTA	AL:	240	1		7 E	
		Viburnum prunifolium	Blackhaw 4	MR	FACU		48	boowwar		N	
	0111/000	Crataegus mollis	Hawthorn		FACU		48			ER	
	SHRUBS	Corvlus americana	Hazelnut		FACU		48		Ū	ß	
		Ameianchier arborea	Redhud	севепу	FACU		40		6	ΞW	
		Amelanchiar arborna	Common Son	icehem,	FACIL	AL:	48		NS N	L SI	
		Juglans nigra	Black Walnut		FACU	N .	48		L H	ър	U
	INCLO	Quercus macrocarpa	Burr Oak		FACU		48		l Ž	0 K	Ľ.
	TREFS	Liriodendron tulipifera	Tuliptree		FACU		48		5	\S AT	0
	CANODY	Quercus alba	White Oak		FACU		48		2	AT 01	i L
		Quercus rubra	Red Oak		FACU		48		Z	1 Z	2
		SCIENTIFIC NAME	COMMON	NAME	STATUS*	(S	TEMS <sup>†</sup> )		L L	교법	1
				-	INDICATOR	R QU	JANTITY		₹	ŏ	<b>.</b>
						A	6.0		l ≥	5	Q 7
	TABLE	5: WOODY STEM PLANTIN	IG FOR MESIC TO	DRY FORE	STED UPLAND		REA 5		N	<u>Р</u> П	S
		······				PLAN	TING AREA		GS	Ξ⊢	
										N	
	be randon	nly planted throughout respe	ective habitat areas.							WE	
	- Substitu	iuons may be made based i le species may comprise mo	upon availability and o pre than 40% of habit	tat, trees an	i with engineer id shrubs should	d				E	
	- Quantity	y based on 100 stems/acre	Inon availability or a	coordinatia-	with anginant				a	Ā	
	Canopy	trees shall be 1-inch calipers	and shrubs shall be	bareroot 2-y	year seedlings.					NL	
	* Wetland	indicator status based on N	lorthcentral and North	heast USDA	A and USACE s	subregion.			1	SC	
					TOTA	AL:	150		Project Title:		
		Sambucus canadensis	Elderberry		FACW		30				P.
		Cornus sericea	Red-osier dog	wood	FAC		30			31	19/20
	SHRUBS	Cornus amomum	Silky dogwood	1	FACW		30		31	Porecho	B
		Cephalanthus occidental	is Buttonbush		FACW		30			Sebut	El.
		Aronia melanocarba	Black chokebe	erry	FAC	-	30		1	A Conroll	11
		QUEICUS DICOIOF	owamp white	Udk	TOTA	NL:	150			1 890%3 1 236529	18
		Platanus occidentalis	American Syca	amore	FACW		30		1.	1 4	2 th
	TREES	Salix nigra	Black Willow		OBL		30		1	A Post P	1.20
	CANODY	Acer saccharinum	Siver Maple		FACW		30			15 07 1	1. Ma
		Acer rubrum	Red Maple		FAC	10	30		Toressioner		
		SCIENTIFIC NAME	COMMON	NAME	STATUS*	100	TEMS		Professional	Seal:	
		r			INDICATOR		3.0		219 S. Erie Toledo, OH 4	Street Fax: 3604 www	: (419) 243-1 .hullinc.com
						I A	UCKES		Hull & Assoc	latas Inc. Pho	ne: (419) 385
	TABL	E 4: WOODY STEM PLAN	TING FOR FOREST	ED WETLA	ND HABITAT		CDEP				
	TABL	E 4: WOODY STEM PLAN	TING FOR FOREST	ED WETLA	ND HABITAT	PLANT	TING AREA		Environm	ent / Energy /	Infrastruc

	[					PLANT	ING AREA			Environm	ent / Energy /	Infrastructu
	TAB	LE 4: WOODY STEM PLAN	TING FOR FOREST	ED WETLAN	id habitat	A	CRES			Hull & Assoc	iates, Inc. Pho	ne: (419) 385-2 • (419) 243-188
					INDICATOF	2 QU	ANTITY			Toledo, OH 4	3604 Water	.hullinc.com
		SCIENTIFIC NAME	COMMON	INAME	STATUS*	(S	TEMS <sup>†</sup> )			Professional	Seal:	
		Acer rubrum Acer saccharinum	Siver Maple		FAC		30				1. B. B.	and the
	CANOP	Y Salix nigra	Black Willow		OBL		30				and second	
	TREES	Platanus occidentalis	American Syca	amore	FACW		30			1	PEP	AL AL
		Quercus bicolor	Swamp White	Oak	FACW		30			1	ERCHE	and a second
			Di la la la la la		TOTA	<u>\L:</u>	150			13	11 13623	JE
		Aronia melanocarpa	Black chokede	erry	FAC		30			1	A Page	and I
	SHRUB	S Cornus amomum	Silky dogwood	ł	FACW		30			1	- Je Sconing	Ekonon C
		Cornus sericea	Red-osier dog	wood	FAC		30				3/	10/20
		Sambucus canadensis	Elderberry		FACW		30					1
					TOTA	AL:	150			Project Title:	:	
	<sup>†</sup> Canopy - Quanti - Substit - No sing be rando	v trees shall be 1-inch calipers ity based on 100 stems/acre tutions may be made based gle species may comprise m imly planted throughout resp	s and shrubs shall be upon availability and ore than 40% of habi ective habitat areas.	bareroot 2-y	ear seedlings. with engineer d shrubs should	d					WETLAND:	
	[					PLAN	ING AREA			GS	LAIN	
	TABLE	5: WOODY STEM PLANTI	NG FOR MESIC TO	DRY FORES	STED UPLAND		REA 5			NIN	<u>Ч</u> С	ç
						A	6.0			A K		2 S
				8	INDICATOR	R QU	ANTITY			R	22	Щ,
		SCIENTIFIC NAME	COMMON	NAME	STATUS*	(S	TEMS <sup>†</sup> )				Щ Ц	러면
		Quercus rubra	Red Oak	1	FACU		48			б	ON AL	Ē
	CANOP	Y Quercus alba	Tulintree		FACU		40			Ē	LS E	59
	TREES	Quercus macrocaroa	Burr Oak		FACU		48			5	Å Å	7
		Juglans nigra	Black Walnut		FACU		48			R	80	E
				2 1	TOTA	AL:	240			ST	25	U g
		Amelanchier arborea	Common Serv	iceberry	FACU		48			Ä	ΞЩ	
		Cercis canadensis	Redbud		FACU		48			8	щœ	
	SHRUB	S Corylus americana	Hazelnut		FACU		48			-	Ř	
	1	I Contractor mallia					10					
		Crataegus monis	Hawthorn		FACU		48				Ψ	
	* Wetlan <sup>†</sup> Canopy - Quanti - Substit	Viburnum prunifolium di indicator status based on l v trees shall be 1-inch calipers ity based on 80 stems/acre tutions may be made based	Hawthorn Blackhaw Northcentral and North s and shrubs shall be upon availability and	heast USDA bareroot 2-yo	FACU FACU TOTA and USACE s ear seedlings. with engineer	AL:	48 48 240	100000	d		PENN 7 EMEI	
	* Wetlan <sup>†</sup> Canopy - Quanti - Substit - No sing througho	Viburnum prunifolium nd indicator status based on h trees shall be 1-inch calipers ity based on 80 stems/acre tutions may be made based gle species may comprise m ut respective habitat areas.	Hawthorn Blackhaw Vorthcentral and North and shrubs shall be upon availability and ore than 40% of habi	heast USDA bareroot 2-y coordination itat, trees and	FACU FACU TOTA and USACE s ear seedlings. with engineer d shrubs should	AL: subregion. d be random	48 48 240	r <i>roww</i> 00	<b>d</b>	Owner:	PENN 7 EMEI	
	* Wetlan <sup>†</sup> Canopy - Quanti - Substit - No sing througho	TABLE 6: LIVE STAKE PI RIPARIAN	Hawthorn Blackhaw Vorthcentral and North and shrubs shall be upon availability and ore than 40% of habi	heast USDA bareroot 2-y ccoordination tat, trees and LAND/WATE ION	FACU FACU TOTA and USACE s ear seedlings. with engineer d shrubs should	d be random PLANTING AREA ACRES	48 48 240 ky planted AREA 1 3:	r <i>roww</i> 00	4	Owner:	DIEEEEBOON	AVENUE
	* Wetlan <sup>†</sup> Canopy - Quanti - Substit - No sing througho	Viburnum prunifolium Ni Indicator status based on I trees shall be 1-inch caliper ity based on 80 stems/acre tutions may be made based gle species may comprise m ut respective habitat areas. TABLE 6: LIVE STAKE PI RIPARIAN SCIENTIFIC NAME	Hawthorn Blackhaw Northcentral and North s and shrubs shall be upon availability and ore than 40% of habi	heast USDA bareroot 2-y- coordination tat, trees and LAND/WATE ION	FACU FACU TOT/ and USACE s ear seedlings. with engineer d shrubs should	d be random	48         48           48         240           ly planted         48           1         5           13         5           15         5	r <i>rdww900</i>	d	Owner:	LENN 1 EWE DEFFERSON SUITE 3 TOLEDO. OH	AVENUE, 00 143604
	* Wetlan <sup>†</sup> Canopy - Quanti - Substit - No sing througho	Indiategus indins Viburnum prunifolium Indiator status based on I trees shall be 1-inch caliper ity based on 80 stems/acre tutions may be made based gle species may comprise m ut respective habitat areas. TABLE 6: LIVE STAKE PI RIPARIAN SCIENTIFIC NAME	Hawthorn Blackhaw Northcentral and North s and shrubs shall be upon availability and ore than 40% of habi core than 40% of habi shore than 40% of habi LANTING FOR WETL SLOPE STABILIZAT COMMON NAP	heast USDA bareroot 2-y coordination tat, trees and LAND/WATE ION ME IN S	FACU FACU TOTA and USACE ear seedlings. with engineer d shrubs should RWAY	L : subregion. d be random PLANTING AREA ACRES 1.4 QUANTI (STAKE 1220	48 48 240 ly planted AREA 1 3: TY S)	r <i>rdww900</i>	d	Owner:	IIWII L NNAI	1 AVENUE 00 43604
	* Wetlan <sup>†</sup> Canopy - Quanti - Substit - No sing througho	Indiategus mons Viburnum prunifolium Indiator status based on I trees shall be 1-inch caliper ity based on 80 stems/acre tutions may be made based gle species may comprise m ut respective habitat areas. TABLE 6: LIVE STAKE PI RIPARIAN SCIENTIFIC NAME Itx discolor litx interior/exiaua	Hawthorn Blackhaw Northcentral and North s and shrubs shall be upon availability and ore than 40% of habi ant 40% of habi SLOPE STABILIZAT COMMON NAP Pussy Willow Sandbar Willow	heast USDA bareroot 2-y coordination tat, trees and LAND/WATE ION ME IN S	FACU FACU TOTA and USACE s ear seedlings. with engineer d shrubs should shrubs should irRWAY	L.: subregion. d be random PLANTING AREA ACRES 1.4 QUANTI (STAKE (STAKE 220 1220 1220	48         48           48         240           by planted         48           1         1           1:         1           1:         1           1:         1	r <i>rdww</i> 00	d	Owner: 600	JEWERNAL D. JEFFERSON SUITE 3 TOLEDO, OF	AVENUE 00 43604 ad and is the of
	* Wetlan † Canopy - Quanti - Substit - No sing througho	Interformer of the second seco	Hawthorn Blackhaw Northcentral and North s and shrubs shall be upon availability and ore than 40% of habi ant and the shall be common water SLOPE STABILIZAT COMMON NAM Pussy Willow Sandbar Willow	heast USDA bareroot 2-yi coordination tat, trees and AND/WATE ION ME IN S	FACU FACU TOTA and USACE s ear seedlings. with engineer d shrubs should shrubs should read shrubs should read should should should should should should read should sho	AL: subregion. PLANTING AREA ACRES 1.4 QUANTI (STAKE 1220 1220 2440	48         48           48         240           by planted         48           1         1           S:         1	r rdww000	4	Owner: 600 This dra	JEFFERSON SUITE 3 TOLEDO, OH awing is copyright rouge of property Hull & Associal	I AVENUE 00 1 43604 ed and is the es, Inc.
	* Wetlan † Canopy - Quanti - Substit - No sing througho Sal Sal Sal Sal Sal Sal Sal S	Indiaegus moins Viburnum prunifolium di indicator status based on 1 trees shall be 1-inch calipers ity based on 80 stems/acre tutions may be made based gle species may comprise m ut respective habitat areas. TABLE 6: LIVE STAKE PI RIPARIAN SCIENTIFIC NAME fix discolor fix interior/exigua Netland indicator status base Quantity based on 1742 stem Substitutions may be made b Space live stakes 5-foot on co	Hawthorn Blackhaw Northcentral and North s and shrubs shall be upon availability and ore than 40% of habi shore than 40% of habi LANTING FOR WETH SLOPE STABILIZAT COMMON NAI Pussy Willow Sandbar Willow d on Northcentral and safe upon availability anter	heast USDA bareroot 2-y coordination tat, trees and LAND/WATE ION ME IN S UND/WATE	FACU FACU TOTA and USACE ear seedlings. with engineer d shrubs should RWAY DICATOR TATUS' FACW TOTAL: USDA and USA	AL: subregion. PLANTING AREA ACRES 1.4 QUANTI (STAKE 1220 1220 2440 ACE subregic ineer	48         48           48         240           ky planted         48           1         1           1	r rowwoo	4	Owner: 600 This dra Reproduct informatio	UNUE LANGE DEFFERSON SUITE 3 TOLEDO, OH Hull & Associat does of or sub-to- to- of the social does of the social doe	AVENUE, 00 43604 es, Inc. the project ow this drawing incity prohibite erved
< (SUBMER	* Wetlan † Canopy - Quanti - Substit - No sing througho Sai Sai - S - S - S - S - S - S - S - S	Interioriexigua Indinicator status based on 1 r trees shall be 1-inch calipers iy based on 80 stems/acre- tutions may be made based gle species may comprise m ut respective habitat areas. TABLE 6: LIVE STAKE PI RIPARIAN SCIENTIFIC NAME If a discolor If a Interioriexigua Wetland indicator status base Quality based on 1742 stem Substitutions may be made b Space live stakes 5-foot on co	Hawthorn Blackhaw Northcentral and Norti s and shrubs shall be upon availability and ore than 40% of habi ant 40% of habi Common NAI Pussy Willow Sandbar Willow d on Northcentral and safed upon availability anter	heast USDA bareroot 2-yi coordination tat, trees and AND/WATE ION ME IN S I Northeast U y and coordin	FACU FACU TOTA and USACE sear seedlings. with engineer d shrubs should read should read shrubs should read should	AL: subregion. PLANTING AREA ACRES 1.4 QUANTI (STAKE 1220 1220 2440 ACE subregic ineer	48         48           48         240           by planted         48           1         1           1	NG AREA 4 ACRES:	d 	Owner: 600 This dra Reproduci informatio perm	UNUE LANGE DEFFERSON SUED OFFERSON SUED OFFERSON SUED OFFERSON SUED OF Hull & Associal duced for use by forceful and there is control full as All rights res copyright and there is control full as All rights res copyright and there is control full as all rights res copyright as all rights res copyrights res copyrights res copyrights res copyrights res copyrights res copyrights res copyrights	AVENUE 00 43604 ad and is the of as, Inc. the project ov the drawning without the frictity prohibite erved
(SUBMER	* Wetlan † Canopy - Quanti - Substit - No sing througho Sai Sai Sai - S - S - S - S - S - S - S - S	Viburnum prunifolium vi reas shall be 1-inch calipers iy based on 80 stems/acre- tutions may be made based gle species may comprise m ut respective habitat areas. TABLE 6: LIVE STAKE PI RIPARIAN SCIENTIFIC NAME Iix discolor Iix Interior/ex/gua Wetland indicator status base Substitutions may be made b space live stakes 5-foot on co	Hawthorn Blackhaw Northcentral and Norti s and shrubs shall be upon availability and ore than 40% of habi ore than 40% of habi shore than 40% of habi contained the shall be contained to the shall be c	heast USDA bareroot 2-y coordination tat, trees and LAND/WATE ION ME IN s J Northeast U y and coordin	FACU FACU TOTA and USACE s ear seedlings. with engineer d shrubs should RWAY DICATOR STATUS* FACW TOTAL: JSDA and US/ ation with engi	AL: subregion. d be random PLANTING AREA ACRES 1.4 QUANTI (STAKE 1220 1220 1220 2440 ACE subregic ineer	48         48           48         240           48         240	NG AREA 4 ACRES: 0.62		Owner: 600 This dra Reproduces informatio perm Mark De X	HI NNA L NNA L NNA J EFFERSON SUITE 3 TOLEDO, OH awing is copyright roledo, of Hull & Associat roledo, of Hull & Associat and the set All rights res All rights res All rights res Copyright 2 metription Copyright 2 metription	AVENUE AVENUE Avenue Autor Aut
SUBMER	* Wetlan † Canopy - Quanti - Substit - No sing througho Sai Sai Sai Sai Sai Sai Sai Sai	Viburnum prunifolium Viburnum prunifolium di dicator status based on 1 trees shall be 1-inch caliper ty based on 80 stems/acre- tutions may be made based gle species may comprise m ut respective habitat areas. TABLE 6: LIVE STAKE PI RIPARIAN SCIENTIFIC NAME Iix discolor Iix Interior/ex/gua Wetland indicator status base Substitutions may be made b space live stakes 5-foot on co QUABLOK) FOR AREA 4 - S COMMON NAME	Hawthorn Blackhaw Northcentral and Norti s and shrubs shall be upon availability and i ore than 40% of habi ore than 40% of habi shall be constructed by the shall be cons	heast USDA bareroot 2-y coordination tat, trees and LAND/WATE ION ME IN S J Northeast U y and coordin TC VEGETA	FACU FACU TOTA and USACE s ear seedlings. with engineer d shrubs should read shrubs should rRWAY DICATOR FACW TOTAL: JSDA and US/ ation with engineer TION FOR PO	AL: Subregion. d be random PLANTING AREA ACRES 1.4 QUANTI (STAKE 1220 1200 1000 120	48         48           48         240           ky planted         48           240         48           yy planted         48           1         5:           TTY         (S)           yon.         48           1         48<	NG AREA 4 ACRES: 0.62 EMBAYMENT QUANTITY (LBS)		Owner: 600 This dra Reproduces informatio permo Mark Da Mark Da Mark Da	U U U U U U U U U U U U U U U U U U U	AVENUE AVENUE 4 43604 ad and is the ad a
(SUBMER NAME	* Wetlan † Canopy - Quanti - Substit - No sing througho Sal Sal Sal Sal - V - C - S - S - S - S - S - S - S - S	Viburnum prunifolium vi rees shall be 1-inch caliper ity based on 80 stems/acce ty based on 80 stems/acce ty based on 80 stems/acce ty based on 80 stems/acce TABLE 6: LIVE STAKE PI RIPARIAN SCIENTIFIC NAME I/X discolor I/X Interior/exigua Vetland indicator status base Quantity based on 1742 stem Substitutions may be made b Space live stakes 5-foot on co QUABLOK) FOR AREA 4 - S COMMON NAME badfruit Bur-Reed	Hawthorn Blackhaw Northcentral and North s and shrubs shall be upon availability and i ore than 40% of habi ANTING FOR WETL SLOPE STABILIZAT COMMON NAP Pussy Willow Sandbar Willow d on Northcentral and is/acre ased upon availability enter UBMERGED AQUAT	heast USDA bareroot 2-y coordination tat, trees and LAND/WATE ION WE IN S I Northeast U y and coordin TC VEGETA DENSITY 15%	FACU FACU TOT/ and USACE ear seedings. with engineer d shrubs should RWAY DICATOR STATUS' FACW TOTAL: JSDA and US/ ation with engineer ( LBS PE	AL: Subregion. AL: Subregion. PLANTING AREA ACRES 1.4 QUANTI (STAKE 1220 1.220 1.220 1.220 1.220 1.4 QUANTI (STAKE 1.220 1.4 QUANTI (STAKE 1.220 1.4 QUANTI (STAKE 1.220 1.4 QUANTI (STAKE 1.220 1.4 QUANTI (STAKE 1.220 1.4 QUANTI (STAKE 1.220 1.4 QUANTI (STAKE 1.4 (STAKE 1.4 (S	48         48           48         48           240         48           240         48           240         48           240         48           240         48           240         48           240         48           240         48           240         48           240         48           240         48           240         48           240         48           240         48           240         48           240         48           250         48           48         48           48         48           48         48           49         48           49         48           40         48           40         48           40         48           41         48           42         48           43         48           44         48	NG AREA 4 ACRES: 0.62 EMBAYMENT QLANTITY (LBS) 1.39		Owner: 600 This dra Reproduct information permo Mark De Reproduct permo Reproduct Permo Reprod	L NNA L NNA J LEFFERSON SUITE 3 TOLEDO, OH toLeto, OH toleto	AVENUE AVENUE 143604 ad and is the of des, Inc. des, Inc
(SUBMER NAME pum emaemon	* Wetlan † Canopy - Quanti - Substit - No sing througho Sal Sal Sal Sal Sal Sal Sal Sal	Viburnum prunifolium viburnum prunifolium id indicator status based on I trees shall be 1-inch calipers ity based on 80 stems/acre tutions may be made based gle species may comprise m ut respective habitat areas. TABLE 6: LIVE STAKE PI RIPARIAN SCIENTIFIC NAME Iix discolor Iix Interior/exigua Wetland indicator status base Quantity based on 1742 stem Substitutions may be made b Space live stakes 5-foot on co QUABLOK) FOR AREA 4 - S COMMON NAME padfruit Bur-Reed ftstem Bulrush	Hawthorn Blackhaw Northcentral and North s and shrubs shall be upon availability and i ore than 40% of habi ore than 40% of habi LANTING FOR WETL SLOPE STABILIZAT COMMON NAP Pussy Willow Sandbar Willow d on Northcentral and Is/acre ased upon availability enter UBMERGED AQUAT	heast USDA bareroot 2-y coordination tat, trees and LAND/WATE ION ME IN s d Northeast U y and coordin TIC VEGETA DENSITY 15% 5%	FACU FACU TOT/ and USACE ear seedings. with engineer d shrubs should rRWAY DICATOR FACW FACW TOTAL: JSDA and US/ ation with engineer ( LBS PE 2. 0.	PLANTING AREA ACRES 1.4 QUANTI (STAKE 1220 1220 1220 1220 1220 1220 1220 122	48 48 240 ly planted AREA 1 S: TY S) OR. PLANTI ACRES: 0.82 WETLAND INTER- CHANNEL POOL QUANTITY (LBS) 1.84 0.61	NG AREA 4 ACRES: 0.62 EMBAYMENT (LBS) 1.39 0.46		Owner: 600 This dra Reproduct information permo Mark Da Fin State Project No	L NNN H NNN	AVENUE 00 ad and is the of a es, Inc. d and is the of a system of this drawn without the project or a system of a
s (SUBMER S NAME Trpum Ternaemon	* Wetlan † Canopy - Quanti - Substit - No sing througho Sal Sal Sal Sal Sal Sal Sal S	Interior/exigua Interior/exigua Notice interior/exigua Notice interior interior interior interior Notice interior interior Notice interior interior Notice interior interior Notice interior N	Hawthorn Blackhaw Northcentral and North s and shrubs shall be upon availability and i ore than 40% of habi LANTING FOR WETL SLOPE STABILIZAT COMMON NAP Pussy Willow Sandbar Willow d on Northcentral and s/acre ased upon availability anter UBMERGED AQUAT INDICATOR STATUS* OBL OBL	heast USDA bareroot 2-y coordination tat, trees and LAND/WATE ION ME IN S d Northeast U y and coordin TIC VEGETA DENSITY 15% 5%	FACU FACU TOT/ and USACE sear seedlings. with engineer d shrubs should rRWAY DICATOR FACW FACW TOTAL: JSDA and US/ altion with engineer ( LBS PE 2. 0. 0.	AL: Subregion. PLANTING AREA ACRES 1.4 QUANTI (STAKE 1220 125 125 125 125 125 125 125 125	48         48           48         240           48         240           48         240	NG AREA 4 ACRES: 0.62 EMBAYMENT (LBS) 1.39 0.46 0.46		Owner: 600 This dra Reproduct informatio Mark Defer Project No Project No Project No Project No	LINE LANGE CONTROL OF	AVENUE 00300 43604 d and is the d and is the project of the first drawn without t
SUBMEF NAME um maemon	* Wetlan † Canopy - Quanti - Substit - No sing througho Sai - S - S - S - S - S - S - S - S	Interesting the second	Hawthorn Blackhaw Northcentral and North s and shrubs shall be upon availability and ore than 40% of habi shall be upon availability and ore than 40% of habi SLOPE STABILIZAT COMMON NAI Pussy Willow Sandbar Willow d on Northcentral and saded upon availability anter UBMERGED AQUAT INDICATOR STATUS* OBL OBL OBL OBL	heast USDA bareroot 2-y coordination tat, trees and LAND/WATE ION ME IN S d Northeast L v and coordin IC VEGETA DENSITY 15% 5%	FACU FACU TOT/ and USACE sear seedlings. with engineer d shrubs should rRWAY DICATOR TATUS' FACW TOTAL: USDA and US/ isation with engineer ( LBS PE 2. 0. 0.	AL: Subregion. PLANTING AREA ACRES 14 QUANTI (STAKE 1220 1220 2440 ACE subregic ineer IND R ACRE 25 75 75 75 75 50	48         48           48         48           240         48           240         48           240         48           240         48           240         48           240         48           240         48           240         49           48         240           48         240           48         240           48         240           49         49           49         49	NG AREA 4 ACRES: 0.62 EMBAYMENT QUANTITY (LBS) 1.39 0.46 0.46 0.46 0.46		Owner: 600 This dra Reproduce informatio Project No Project Project	LINNUL L	AVENUE 00 4 34804 4 ad and is the d and d and d and d and
s NAME rpum n	* Wetlan † Canopy - Quanti - Substit - No sing througho Sai Sai Sai Sai Sai Sai Sai S	Interface of the second	Hawthorn Blackhaw Northcentral and Norti s and shrubs shall be upon availability and ore than 40% of habi are than 40% of habi Common NAP Pussy Willow Sandbar Willow COMMON NAP Pussy Willow Sandbar Willow d on Northcentral and s/acre ased upon availability anter UBMERGED AQUAT INDICATOR STATUS* OBL OBL OBL OBL OBL	heast USDA bareroot 2-y coordination tat, trees and AND/WATE ION ME IN S IN AND/WATE ION IN ME IN S ION IN CVEGETA DENSITY 15% 5% 5%	FACU FACU TOT/ and USACE sear seedlings. with engineer d shrubs should rubs should rRWAY DICATOR TATUS' FACW FACW FACW TOTAL: USDA and US/ ation with engineer d LBS PE 2. 0. 0. 0. 0. 0.	AL: Subregion. PLANTING AREA ACRES 144 QUANTI (STAKE 1220 2440 ACE subregic ineer IND R ACRE 25 75 75 50 75 50 75 50 75	48         48           48         240           ky planted         48           240         48           240         48           240         48           240         48           240         48           240         48           240         48           240         48           240         48           240         48           48         240           48         240           48         240           48         240           48         240           48         240           48         240           48         240           48         240           51         31           52         31           53         31           53         32           54         32	NG AREA 4 ACRES: 0.62 EMBAYMENT QUANTITY (LBS) 1.39 0.46 0.46 0.46 0.93 0.46 0.93 0.46		Owner: 600 This dra Reproduction Mork De Finitian Project Nr Project Nr	L     NN     L     L     L     Scale     L     L     Scale     L     L     L     Scale     L     Scale     L     L     Scale     L     L     L     Scale     L	AVENUE ad and is the be project of the project of the drawn and and is the project of the drawn inclup prohibit (300) 1 (100) 1 (
< (SUBMEF	* Wetlan † Canopy - Quanti - Substit - No sing througho Sal Sal Sal Sal Sal Sal Sal S	Interface of the second	Hawthorn Blackhaw Northcentral and North s and shrubs shall be upon availability and io ore than 40% of habi ore than 40% of habi shall be contained and the shall be contained and the shall be common availability ased upon availability and on Northcentral and shall be common availability and availability	heast USDA bareroot 2-y coordination tat, trees and LAND/WATE ION ME IN S J Northeast U y and coordin IC VEGETA DENSITY 15% 5% 10% 5%	FACU FACU TOT/ and USACE sear seedlings. with engineer d shrubs should rWAY DICATOR TATUS' FACW TOTAL: JSDA and US/ ation with engi tION FOR PO ( LBS PE 2. 0. 0. 0. 1. 1. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2.	AL:           subregion.           bubregion.           AL:           subregion.           d be random           AREA           ACRES           1.4           QUANTING           AREA           ACRES           1.4           QUANTING           AREA           ACRES           1.220           2440           ACE subregic           ineer           IND           R           25           75           50           75           50           75           25	48         48           48         240           y planted         AREA           1         3:           TTY         S)	NG AREA 4 ACRES: 0.62 EMBAYMENT QUANTITY (LBS) 1.39 0.46 0.46 0.46 0.46 0.46 0.46 1.39		Owner: 600 This dra Reproducin It is pro Reproducin informatio perm Mark De Ca Sist Project Ne Project Ne Project Ne Project Ne Project Ne Ca Ca Sist Project Ne Project Ne Scale:	LINING CONTRACTOR OF CONTRACTO	AVENUE AVENUE
< (SUBMER C NAME rpum n n	* Wetlan † Canopy - Quanti - Substit - No sing througho Sai Sai Sai Sai Sai Sai Sai Sai	Interegus motins Viburnum prunifolium di indicator status based on I trees shall be 1-inch caliper ity based on 80 stems/accer ty based on 80 stems/accer and the status based on 1 trees shall be 1-inch caliper ity based on 80 stems/accer TABLE 6: LIVE STAKE PI RIPARIAN SCIENTIFIC NAME Iix discolor Iix Interior/ex/gua Netland indicator status base Quantity based on 1742 stem Substitutions may be made b Space live stakes 5-foot on co QUABLOK) FOR AREA 4 - S COMMON NAME badfruit Bur-Reed fistem Bulrush olgrass terican Water Plantain skerelweed nged Sedge te Cutgrass	Hawthorn Blackhaw Northcentral and North s and shrubs shall be upon availability and i ore than 40% of habi core than 40% of habi shall be common availability common North Pussy Willow Sandbar Willow d on Northcentral and s/acre ased upon availability anter UBMERGED AQUAT INDICATOR STATUS* OBL OBL OBL OBL OBL OBL OBL	heast USDA bareroot 2-y coordination tat, trees and LAND/WATE ION WE IN S Van Coordin I Northeast U v and coordin IC VEGETA DENSITY 15% 5% 5% 5% 5% 5% 5% 5%	FACU FACU TOT/ and USACE ear seedlings. with engineer d shrubs should RWAY DICATOR STATUS' FACW TOTAL: JSDA and US/ ation with engineer ( LBS PE 2. 0. 0. 0. 1. 2. 2. 2. 2.	AL: Subregion. AL: Subregion. AREA ACRES 1.4 QUANTING AREA ACRES 1.20 1.220 1.220 1.220 2.240 ACE subregic ineer IND R ACRE 25 50 75 25 25 25	48         48           48         240           y planted         AREA           1         3:           TTY         S)	NG AREA 4 ACRES: 0.62 EMBAYMENT QUAYITIY (LBS) 1.39 0.46 0.46 0.93 0.46 0.93 0.46 1.39 1.39		Owner: 600 This dra Reproduct information Project No Project	UIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	AVENUE AVENUE AVENUE ad and is thi ad and is the ad and is thi ad and is the ad and ad and is the ad ad and is the ad ad ad and is the ad ad a
C (SUBMER C NAME rpum nernaemon	* Wetlan † Canopy - Quanti - Substit - No sing througho Sal Sal Sal Sal Sal Sal Sal Sal	Interior/exigual Interior/exigual Interestation interior interior interior Interestation interior interior interior Interestation interior interior interior interior Interior interior interi	Hawthorn Blackhaw Northcentral and North s and shrubs shall be upon availability and i ore than 40% of habi ore than 40% of habi SLOPE STABILIZAT COMMON NAP Pussy Willow Sandbar Willow d on Northcentral and s/acre ased upon availability enter UBMERGED AQUAT INDICATOR STATUS* OBL OBL OBL OBL OBL OBL OBL OBL OBL	heast USDA bareroot 2-y coordination tat, trees and LAND/WATE ION ME IN S ION ME IN S ION ION ION ION ION ION ION ION ION ION	FACU FACU TOT/ and USACEs ear seedings. with engineer d shrubs should rRWAY DICATOR FACW FACW FACW TOTAL: JSDA and US/ ation with engineer d LBS PE 2. 0. 0. 0. 0. 2. 2. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.	PLANTING AREA ACRES 1.4 QUANTI (STAKE 1220 1220 1220 1220 1220 1220 1220 122	48         48           48         240           48         240           48         240           48         240           48         240           48         240           48         240           48         240           48         240           48         240           48         240           48         240           48         240           48         240           48         240           48         240           48         240           48         240           48         240	NG AREA 4 ACRES: 0.62 EMBAYMENT QUANTITY QUANTIT		Owner: 600 This dra Reproduct information Project No Project	LIN NULL DJ JEFFERSON SUITE 3 TOLEDO, OH SUITE 3 SUITE 3 SUITE 3 TOLEDO, OH SUITE 3 TOLEDO, OH SUITE 3 TOLEDO, OH SUITE 3 SUITE 3	AVENUE 00 ad and is the of and of and is the of and of and of and of and of and of and of and of and of and of and of and of and of and of and of and of and of and of and
< (SUBMER C NAME rpum n	* Wetlan † Canopy - Quanti - Substit - No sing througho Sal Sal Sal Sal Sal Sal Sal S	Interior/exigua Viburnum prunifolium viburnum prunifolium id indicator status based on I trees shall be 1-inch calipers ity based on 80 stems/acre tutions may be made based gle species may comprise m ut respective habitat areas. TABLE 6: LIVE STAKE PI RIPARIAN SCIENTIFIC NAME Iix discolor Iix Interior/exigua Wetland indicator status base Quantity based on 1742 stem Substitutions may be made b Space live stakes 5-foot on co QUABLOK) FOR AREA 4 - S COMMON NAME badfruit Bur-Reed fistem Bulrush olgrass terican Water Plantalin kerelweed nged Sedge nged Sedge nged Sedge nged Sedge refugins Blueflag rsh Seedbox	Hawthorn Blackhaw Northcentral and North s and shrubs shall be upon availability and i ore than 40% of habi LANTING FOR WETL SLOPE STABILIZAT COMMON NAJ Pussy Willow Sandbar Willow d on Northcentral and s/acre ased upon availability enter UBMERGED AQUAT INDICATOR STATUS* OBL OBL OBL OBL OBL OBL OBL OBL OBL OBL	heast USDA bareroot 2-y coordination tat, trees and LAND/WATE ION ME IN S d Northeast L y and coordin TIC VEGETA DENSITY 15% 5% 5% 5% 5% 5% 5% 5%	FACU FACU TOT/ and USACE ear seedlings. with engineer d shrubs should rikWAY DICATOR FACW FACW TOTAL: JSDA and US/ altion with engineer ( LBS PE 2. 0. 0. 1. 0. 0. 2. 2. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.	AL: subregion. PLANTING AREA ACRES 1.4 QUANTI (STAKE 1220 125 125 125 125 125 125 125 125	48         48           48         240           48         240           48         240	NG AREA 4 ACRES: 0.62 EMBAYMENT QUANTITY (LBS) 1.39 0.46 0.46 0.93 0.46 1.39 0.46 1.39 0.46		Owner: 600 This dra Reproduct informatio Project No Project	LINE STORES	AVENUE 04 34604 ad and is the of the gravity of the project of the gravity of the gravity of the project of the gravity of the gravity of the gravity of the gravity of the gravity of the
(SUBMEF	* Wetlan † Canopy - Quanti - Substit - No sing througho Sai Sai Sai Sai Sai Sai Sai S	Interesting the second	Hawthorn Blackhaw Northcentral and Norti s and shrubs shall be upon availability and ore than 40% of habi are than 40% of habi Common Nan Pussy Willow Sandbar Willow d on Northcentral and safe upon availability anter UBMERGED AQUAT INDICATOR STATUS* OBL OBL OBL OBL OBL OBL OBL OBL OBL OBL	heast USDA bareroot 2-y coordination tat, trees and AND/WATE ION ME IN S d Northeast U and coordin IC VEGETA DENSITY 15% 5% 5% 15% 15% 15% 15%	FACU FACU FACU TOT/ and USACE ear seedlings. with engineer d shrubs should rRWAY DICATOR TATUS' FACW FACW TOTAL: USDA and US/ istion with engineer to the second to the se	NL:	48         48           48         240           y planted         AREA           1         S:           TY         S)	NG AREA 4 ACRES: 0.62 EMBAYMENT QUANTITY (LBS) 0.46 0.46 0.93 0.46 1.39 0.46 1.39 0.46 0.93 0.46 0.93 0.46 0.93		Owner: 600 This dra Reproduce informatio Project No Project	UIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	AVENUE AVENUE 00 4 43604 d and is the d and is the d f in a drawn is the project of a the proj
( (SUBMER > NAME rpum n	* Wetlan † Canopy - Quanti - Substit - No sing througho Sai Sai Sai Sai Sai Sai Sai S	Interior status based on 1 v trees shall be 1-inch calipers iy based on 80 stems/acre- tutions may be made based gle species may comprise m ut respective habitat areas. TABLE 6: LIVE STAKE PI RIPARIAN SCIENTIFIC NAME If a discolor If interior/exigua Wetland indicator status base QUABLOK) FOR AREA 4 - S COMMON NAME based fruit Bur-Reed fistem Bulrush oigrass terican Water Plantain kerelweed nghair Sedge te Cutgrass reduga Bueflag rsh Seedbox aadleaf Arrowhead miock Waterparsnip	Hawthorn Blackhaw Northcentral and North s and shrubs shall be upon availability and ore than 40% of habil ore than 40% of habil core than 40% of habil core than 40% of habil core than 40% of habil core than 40% of habil to a the the the the the the shall core the the the shall core the the the core the the the the the shall core the the the the shall core the the the the core the the the the the the the core the the the the the the the the core the the the the the the the the the th	heast USDA bareroot 2-y coordination tat, trees and LAND/WATE ION ME IN S J Northeast I y and coordin IC VEGETA DENSITY 15% 5% 15% 5% 15% 5%	FACU FACU TOT/ and USACE sear seedlings. with engineer d shrubs should rubs should rubs should rRWAY DICATOR FACW FACW FACW TOTAL: USDA and US/ ation with engineer ( LBS PE 2. 0. 0. 0. 0. 1. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.	NL:	48         48           48         240           y planted         AREA           1         3:           TY         (S)	NG AREA 4 ACRES: 0.62 EMBAYMENT QUANTITY (LBS) 1.39 0.46 0.46 0.46 0.46 0.46 0.46 0.93 0.46 0.46 0.93 0.46 0.93 0.46 0.93 0.46		Owner: 600 This dra Reproduction Reproduction Finite Finite Project Nr Project Nr	LANTING N	AVENU AVENU 00 4.43604 ad and is th of ad and is th of ad and is th ad and ad and is th ad and ad

- Round total quantity up to nearest pound for estimating and purchasing purposes

Sheet Number

20 OF 22

C9.2



### APPENDIX D

Invasive Plants Fact Sheets

### Fact Sheet Index

Amur, Morrow's & Tatarian Honeysuckle Garlic Mustard Common Reed Grass (Phragmites) Reed Canary Grass Japanese Knotweed Narrow-leaved and Hybrid Cattail Flowering Rush



## **INVASIVE PLANTS OF OHIO**

Fact Sheet 1

### Amur, Morrow's & Tatarian Honeysuckle

Lonicera maackii, L. morrowii, L. tatarica



### **DESCRIPTION:**

Amur, Morrow's and Tatarian bush honeysuckles are upright, deciduous shrubs that range from 6 to 15 feet in height at maturity. Older stems have hollow pith (center). Two native bush honeysuckles, bush honeysuckle (Diervilla lonicera) and Canada fly honeysuckle (Lonicera canadensis) may be confused with these nonnatives: proper identification is Branches of the native necessary. species have solid stems, while the non-natives have hollow pith.

The 1-2½ inch leaves are opposite along the stem and short-stalked. Amur honeysuckle has dark green leaves that end in a sharp long-pointed tip; the leaf underside has hair along the veins. Morrow's and Tatarian both have oval to egg-shaped leaves. The underside of Morrow's leaves is consistently hairy, while Tatarian lacks hair.

Pairs of tubular flowers less than an inch long are borne along the stem in the leaf axils. Amur flowers have very short, pubescent peduncles (stems). Morrow's peduncles are long and pubescent, while Tatarian's are long and glabrous (smooth). Flowering generally occurs from early to late spring. Yellow to dark-red berries mature from late August to October. Showy pink honeysuckle (*L. x bella*) is an invasive hybrid of Morrow's and Tatarian with showy pink flowers.

Amur honeysuckle is native to China, Russian Far East, Korea, and Japan. Morrow's honeysuckle is native to Korea and Japan. Tatarian honeysuckle



is native to Russia, Central Asia, and China. Tatarian honeysuckle was introduced into North America in 1752; Amur and Morrow's honeysuckles came in the late 1800s, as ornamental plants. Subsequently, they were promoted for wildlife cover and soil erosion control, in addition to landscaping.



### HABITAT:

These non-native bush honeysuckles are relatively shade-tolerant, invading mesic to moist woods as well as forest edges, abandoned fields, prairie remnants, pastures, and other open, upland habitats. Woods that have been grazed or disturbed are more susceptible to invasion. Morrow's honeysuckle is capable of invading bogs, fens, lakeshores, and sandy plains. Amur honeysuckle prefers limestone-based soils.

### INVASIVE CHARACTERISTICS:

Amur, Morrow's, and Tatarian bush honeysuckles fruit prolifically and are highly attractive to birds, which widely disseminate seeds across the landscape. Deer also disperse seeds. Cut stems will resprout vigorously. These shrubs shade native vegetation since they leaf out earlier in the spring and drop their leaves later in the fall than native plants. It has been documented that birds nesting in honeysuckle suffer greater nest predation than those nesting in native shrubs.

### CONTROL:

Mechanical: Hand removal of seedlings or small plants may be effective for light infestations, but care should be taken to remove the entire plant and minimize soil disturbance. In shaded forest habitats. where bush honeysuckles tend to be less resilient, repeated cutting to ground level, during the growing season, may result in high mortality. Cutting must be repeated at least once annually or bush honeysuckles will often form stands that are more dense and productive than they were prior to cutting. For thickets of seedlings or small saplings, repeated mowing or bush-hogging may be effective.





Prescribed burning may be used to control bush honeysuckles growing in open habitats, if there is enough fuel. In all instances, control should be initiated prior to the seed dispersal period (late summer to early autumn) to minimize reinvasion of treated habitats. Chemical control:

Selective herbicide application is the most effective control method for woody invasive plants. Herbicides can be applied to the foliage (low volume or high volume during the growing season), cut stems (at the time of cutting), or to the bark of the lower portions of the stems/trunks. Herbicides for foliar application include Roundup, AquaNeat, Glypro, Rodeo, Razor, and Escort. Herbicides for cut stem or basal bark application include Garlon 4, Stalker, Pathfinder, and Pathway.

herbicides require

a penetrating or

sticking agent.

Well-established stands of bush honeysuckles are best managed by cutting the stems to ground level and painting or spraying the stumps. Foliar application should only be used when the ambient temperature is above 65 degrees F. All three bush honeysuckle species leaf out early in the spring and hold their leaves late into the fall, creating ideal times for foliar herbicide application particularly in large monotypic stands. To be most effective, many





<u>Biological</u>: No biological control agents are currently available for these plants.

Note: Maps of species' ranges are based on records as of 2010.

### Credits and additional information:

Plant Conservation Alliance-Alien Plant Working Group Ohio Department of Natural Resources, <u>www.ohiodnr.gov</u> The Nature Conservancy, Ohio Chapter The Ohio State University Extension, <u>http://woodlandstewards.osu.edu</u> OIPC website, <u>www.oipc.info</u>



# **INVASIVE PLANTS OF OHIO**

### Fact Sheet 3

### Garlic Mustard

Alliaria petiolata



### **DESCRIPTION:**

Garlic mustard is a biennial herb that emits a garlic-like odor from crushed leaves. In the first year, a rosette of kidney-shaped leaves hug the ground and remain green throughout the winter. Sharply-toothed, triangular leaves form on the 2-4 foot tall flower stem during the second year. White flowers with four petals bloom in clusters at the end of the stem from late April to mid June. The fruit is a long, green capsule that turns brown as the seeds mature. As the plant dies, the long, brown seed capsules at the end of a long naked stem split and release hundreds of seeds.

Garlic mustard was introduced from Europe for herbal and medicinal purposes. In 1868, it was first recorded in Long Island, New York. It is recorded from nearly every county in Ohio.

### HABITAT:

Garlic mustard prefers some shade in mesic upland and floodplain forests, savannas, pastures, lawns, and along fencerows and roadsides. It invades forest edges and progresses into the interior along streams and trails.

### **INVASIVE CHARACTERISTICS:**

In forests and woodlands, garlic mustard reduces growth of wildflowers in the early spring before canopy leaf out, and suppresses soil fungi that are mutualistic with trees. It produces large quantities of seeds that can remain viable for up to 10 years. Seeds are dispersed by water or transported by animals and humans.



Map based on records as of 2010.

### CONTROL:

Mechanical: Hand-pulling is effective in small infestations. Care must be taken to insure that the entire plant, including the root system, is removed and all plant materials are bagged and taken off-site. The plant can continue to mature and produce seeds even after it has been pulled. Control should continue until the seed bank is exhausted (at least 7 years). Cutting stems when flowering can be effective in larger populations. The stems should be cut low to ensure that flowering is hampered. Cutting during flowering generally results in total mortality of the plant. However, seed heads will continue to mature and disperse seeds, so plants should



either be cut into pieces or all cut materials should be removed from the site. Control in the spring, targeting first-year rosettes and second-year plants before they flower, is generally more effective than fall treatment of only first-year rosettes. Prescribed fire in late spring can be effective in large populations, particularly if conducted for several years.



<u>Chemical</u>: Foliar application of systemic herbicides, such as Roundup, Glypro, or AquaNeat, is effective, even in winter (to kill overwintering rosettes), as long as the temperature is at least 50 degrees F and the area remains dry for eight hours. Extreme care must be taken not to apply the herbicide on desirable plants as these products are non-selective. Herbicide application to the first-year rosettes in the late fall, winter, and early spring will minimize impacts to nontarget species while they are dormant. It is crucial to spray all plants within the control area, otherwise the survivors will respond with greater growth and

reproduction. If carried out in late fall or winter, it is essential to kill all rosettes in the treated areas, otherwise the survivors will grow large in the absence of competition and seed production will not be lower than in untreated areas. Spray shields may also be used to better direct herbicide and limit non-intentional drift.

### **Biological**:

Researchers at Cornell University are investigating potential biological control agents for garlic mustard. Four weevil species that feed on stems, seeds, and root-crowns are being studied for bio-control of garlic mustard.

### Credits and additional information:

Plant Conservation Alliance-Alien Plant Working Group Ohio Department of Natural Resources, <u>www.ohiodnr.gov</u> The Nature Conservancy, Ohio Chapter Noxious Weed Control Board (WA), <u>www.nwcb.wa.gov/siteFiles/Alliaria petiolata.pdf</u> The Ohio State University Extension, <u>http://woodlandstewards.osu.edu</u> OIPC website, www.oipc.info



## **INVASIVE PLANTS OF OHIO**

### Fact Sheet 5



### Common Reed Grass (Phragmites)

Phragmites australis ssp. australis

### **DESCRIPTION:**

Common reed grass is a tall, perennial wetland grass, 5-10 feet in height. Both native and introduced Phragmites are found in the state. The introduced Phragmites forms a dense network of rhizomes with deep roots. Vertical stalks arise from the rhizomes forming dense colonies. The stiff, hollow stalks support elongate and flat 1 ½ to 2 inch wide leaves. Flowers form bushy panicles in late July and August and are usually purple or golden in color. As seeds mature, the panicles begin to look "fluffy" due to the hairs on the seeds and they take on a grey sheen.

It is difficult to distinguish native Phragmites from the introduced. However, a number of morphological characteristics have been identified that can be used to determine a population's type. Characteristics that separate the native from the introduced Phragmites include

stems that are smooth, shiny and often purplish, and short ligules between 1-1.7 mm in length, for the native type.

Introduced common reed grass is thought to have arrived in North America accidentally, most likely in ballast material in the late 18th or early 19th centuries. It established itself along the Atlantic coast and over the course of the 20th century, spread across the continent. In Ohio, the introduced subspecies is found throughout the state with it being more common in northern half.

### HABITAT:

Common reed grass is found in brackish and freshwater marshes, river edges, shores of lakes and ponds, roadsides, fens, swamps, wet meadows, and disturbed moist/wet areas.



Map based on records as of 2010.

### **INVASIVE CHARACTERISTICS:**

Common reed grass quickly invades a site and can take over a marsh community, crowding out native plants, changing marsh hydrology, altering wildlife habitat, and increasing fire potential. Its tall stems and dense growth pattern block light to other plants and its rhizomes spread rapidly across the soil surface (10-20 feet in length), creating a monoculture stand. Phragmites can spread to new areas by seed dispersal and vegetative rhizome fragments. It had been thought for years that Phragmites did not produce many viable seeds, but recent research at The Ohio State University has documented that seeds are typically viable and germinate in mudflat conditions (Campbell 2010).



### CONTROL:

Mechanical: Cutting, pulling or mowing can be done in late July for several vears. Prescribed burning after the plant has flowered, either alone or in combination with herbicide treatment, may be effective. Burning after herbicide treatment reduces standing dead stem and litter biomass which may help to encourage germination

of native plants in the following growing season. Plants should not be burned in the spring or summer before flowering as this may stimulate growth.

### Chemical:

Herbicide application using Rodeo, Accord, Glypro, AquaNeat, or Habitat/Polaris is most effective in the late summer or early fall, after tasseling, and should be applied at least 2 years in a row depending on the size of the population. Fusilade, a grass-specific herbicide, can be applied in non-aquatic habitats. Habitat/Polaris is best used for extensive monocultures as it is a residual herbicide, but is extremely effective on Phragmites. Be sure to use a non-ionic surfactant with the herbicide in wet areas. Application methods may include aerial spraying, hand-held or backpack sprayers, and hand-wicking. Extensive populations have rhizome networks and will require multiple applications to achieve effective control.

<u>Biological</u>: There are several native insects that feed on Phragmites as well as a few Eurasian insects that feed on Phragmites that have become naturalized in North America. Their impact and distribution are currently unknown.

### **Credits and additional information:** Plant Conservation Alliance-Alien Plant Working Group Ohio Department of Natural Resources, <u>www.ohiodnr.gov</u> The Nature Conservancy, Ohio Chapter Cornell University, <u>www.invasiveplants.net</u> OIPC website, www.oipc.info



## **INVASIVE PLANTS OF OHIO**

### Fact Sheet 6

### **Reed Canary Grass**

### **DESCRIPTION:**



Reed canary grass is a large, coarse grass that attains a height of 2 to 7 feet. The erect. hairless stem supports rough-textured, tapering leaves of 3 1/2 to 10 inches long and 1/4 to 3/4 inch wide. One of the first grasses to sprout in the spring, reed canary grass produces compact panicles that are erect or slightly spreading and range from 3 to 16 inches long. Flowers occur in dense clusters in May to mid-June. They are green to purple at first and change to beige over time. Shiny brown seeds ripen in late June and are dispersed by water, animals, humans and machines. This grass forms a thick rhizome system that quickly dominates a site.

Sources document native and non-native genotypes. The non-native strain is more invasive than the native strain. The nonnative originates in temperate regions of Europe and Asia. Both strains have been planted throughout the U.S. since the 1800s for forage and erosion control.

### HABITAT:

Reed canary grass grows best on fertile, moist organic soils in full sun. It can grow in standing water by producing special roots along the submersed portion of the stem. It also grows on dry soils in upland sites and under partial shade.

### INVASIVE CHARACTERISTICS:

Reed canary grass reproduces prolifically vegetatively as well as by seed. This species can invade most types of wetlands, including marshes, wet prairies, sedge meadows, fens, stream and river banks, ditches and



seasonally wet areas; it also grows in disturbed upland areas. Stands are difficult to eradicate because large seed banks and extensive root systems allow its re-colonization of sites.

### Phalaris arundinacea



### CONTROL:

### Mechanical:

Hand-pulling can be effective for small populations. Care must be taken to remove the entire plant, including the roots; all plant materials should be bagged and taken off-site. Removal is recommended as plants can continue to mature and produce seeds even after they are pulled. Small patches can also be covered with black plastic for at least one growing season.

Plants can also be cut or mowed, but repeated cutting or mowing is usually needed for effective control. Discing or plowing can be used to control a well-established population, although this method basically reduces the density without killing the plants.

### Chemical:

Foliar application of systemic herbicides such as AquaNeat, Accord, and Rodeo (approved for wetland/aquatic application) can be very effective, especially if applied in the early spring or late fall when other native vegetation is dormant (to minimize impacts on native plants). The most effective treatment time occurs after flowering/seed set and before the plant goes dormant for the winter. To be most effective, many herbicides require a penetrating or sticking agent such as Nu-Film-P; be sure to use a non-ionic surfactant in wet areas. Removal of the previous year's growth to expose the new green shoots increases the effectiveness of the herbicide. In the fall, herbicide can be applied after mowing reed canary grass.



### Biological:

There are no biological control methods currently known for reed canary grass.

### Credits and additional information:

Plant Conservation Alliance-Alien Plant Working Group Ohio Department of Natural Resources, <u>www.ohiodnr.gov</u> The Nature Conservancy, Ohio Chapter USDA Forest Service, Forest Health Staff, Newtown Square, PA OIPC website, <u>www.oipc.info</u>

Note: Map of species' range is based on records as of 2010.



# **INVASIVE PLANTS OF OHIO**

### Fact Sheet 10

### Japanese Knotweed

Fallopia japonica



### **DESCRIPTION:**

Japanese knotweed is an upright, shrub-like, herbaceous perennial that can grow to over 10 feet in height. The stout, hollow stems are reddishbrown and the nodes are swollen, giving them a bamboolike appearance. Typical of the smartweed family, nodes are enclosed by a modified leaf-like structure. Leaves are alternate and egg-shaped (4-6 inches long and 3-4 inches wide), narrowing to a point at

the tip. The minute greenish-white flowers are borne in plume-like clusters in the upper leaf axils in summer and are followed soon after by small shiny, black-winged fruits. There is an ornamental variety with pink flowers.

Japanese knotweed was probably introduced from Asia in the late 1800s. It was first introduced as an ornamental and has also been used for erosion control and for landscape screening. It is widely distributed in the U.S. and found throughout Ohio.

### HABITAT:

Japanese knotweed occupies a wide variety of habitats in many soil types with a range of moisture conditions. It poses a significant threat to riparian areas, where it can survive severe flooding. It is also found along roadsides, lowlying areas, utility rights-of-way, old home sites and along woodland edges and openings.



Map based on records as of 2010.

### INVASIVE CHARACTERISTICS:

Japanese knotweed grows aggressively by extensive rhizomes forming dense thickets. It is often transported to new sites as rhizome and seed contaminants in fill dirt. It is a threat to riparian areas as small pieces of rhizome washed downstream can establish new colonies. Neglected gardens and discarded cuttings are common routes of dispersal from urban areas.



### **CONTROL:** Mechanical:

Large colonies are extremely difficult to dig due to their high rhizome densities. Digging of large colonies is not recommended as it is very labor intensive and unlikely that all below ground material can be removed. Small patches may be dug; however, care should be used in removing plant material and placing it in plastic bags for proper

disposal. Repetitive cutting or mowing within a single growing season has been effective. Eradication of the rhizome system is necessary for complete control.

### Chemical:

Systemic herbicides have been generally effective at controlling Japanese knotweed. Repetitive cutting of stems combined with spot application of Roundup, Accord, Glypro, AquaNeat, Rodeo, Habitat/Polaris, or Garlon 3A on the re-sprouting leaves, as well as foliar spraying in large populations will control knotweed populations. Due to the extensive rhizome system, multiple herbicide applications may be required. Best control has been obtained in Ohio with Roundup and Habitat. Some

#### Knotweed flowers



herbicides are approved for wetland or riparian use (e.g., Accord, Glypro, AquaNeat), while others should only be used in upland sites. To be most effective, many herbicides require a penetrating or sticking agent such as Nu-Film-P.

### **Biological**:

There are numerous insects and pathogens that attack the species in its natural habitats. No research has been conducted on these possible biological controls.

### Credits and additional information: Plant Conservation Alliance-Alien Plant Working Group

Ohio Department of Natural Resources, <u>www.ohiodnr.gov</u> The Nature Conservancy, Ohio Chapter Cornell University, <u>www.invasiveplants.net</u> OIPC website, <u>www.oipc.info</u>



# **INVASIVE PLANTS OF OHIO**

### Fact Sheet 11

### Narrow-leaved and Hybrid Cattail

Typha angustifolia, T. x glauca



### DESCRIPTION:

Narrow-leaved cattail is an introduced species which hybridizes with the native common cattail (T. latifolia), shown at right in the photo. The hybrid produced is also an invasive, T. x glauca. All three aquatic/wetland perennials may grow to a height of 10 feet and produce a velvety brown spike of flowers. The hybrid and narrow-leaved cattail flower spikes have a gap of 1 to 4 inches between the male and female flowers, while there

is no gap between the flowers of the native cattail. The leaves originate at the base of the stem and spread outward as they rise into the air. The invasive species and its hybrid have leaves that are  $\frac{1}{4}$  to  $\frac{3}{4}$  inches wide; the native cattail leaves are  $\frac{1}{2}$  to 1 inch. Below ground, starchy rhizomes anchor the plant to the soil. If the plants are growing in a colony, their rhizomes may become intertwined and form a dense mat.

Narrow-leaved cattail is believed to have been introduced to the Atlantic seaboard from the dry ballast of European ships. It has spread westward and occurs throughout much of the United States. The hybrid cattail may occur wherever both the native and the narrow-leaved species are present. All three taxa are found throughout Ohio. The native cattail's frequency and distribution is shrinking due to the spread of narrow-leaved and hybrid cattails.

### HABITAT:

Cattails can be found in damp soil or shallow water where sufficient nutrients are available. They are commonly found along expressways, in artificial ditches and shallow ponds, at the edges of calm waters, in consistently damp patches of rural and suburban yards, in marshes as well as brackish and polluted waters to a depth nearing 3 feet. These taxa also invade fens, wet meadows, wet prairies, and beach swales.



### **INVASIVE CHARACTERISTICS:**

Narrow-leaved and hybrid cattail establish dense stands and may be allelopathic, producing chemicals which discourage growth of other plants. Cattails reproduce both vegetatively by rhizomes and sexually through massive amounts of seeds. The flower head of the parent plant can produce 250,000 seeds, which are wind-dispersed. Seeds may remain viable in the seed bank for up to 100 years. Cattail seeds prefer freshwater, and will not germinate unless saturated in at least 1/2 an inch of water.

### CONTROL:

Mechanical: Manipulation of water levels can kill cattails by inhibiting airflow from the cattail shoots to the roots. Removing dead leaves and submerging the shoots in early spring will eliminate gas diffusion and will eventually "suffocate" the plant. It is critical to remember that even if dead leaves from the previous year are completely removed, aerobic conditions will be restored to the rhizome as soon as the new growing shoot penetrates the water surface. Even if water levels are sustained at only a few inches above the tops of the growing shoots, oxygen is prevented from reaching the rhizomes. Burning and disking are not effective for these species due to the extensive rhizomes.



<u>Chemical</u>: Foliar application of systemic herbicides such as Accord, Rodeo, Glypro, AquaNeat, and Habitat/Polaris can be very effective. A non-ionic surfactant should be added to the herbicide in wet areas. Herbicides can be applied aerially, using low and high volume spraying, and hand-wicking for smaller populations or those mixed with native wetland vegetation (to minimize treatment of non-target species). Treatment in late summer or early fall is most effective. Re-treatments are usually necessary due to the extensive rhizome system.

<u>Biological</u>: Population levels of ten muskrats per acre, when combined with high springtime water levels, can nearly eliminate the emergence of cattails within a span of two years. Water levels in the range of four to five feet also favor the wintertime survival of muskrats in flooded areas. Grazing on seedlings and young cattails without extensive rhizomes can reduce the stem density of the colony. For mature plants, grazing combined with water-level management reduces survival rates.

**Credits and additional information:** Plant Conservation Alliance-Alien Plant Working Group Ohio Department of Natural Resources, <u>www.ohiodnr.gov</u> The Nature Conservancy, Ohio Chapter Wisconsin DNR, <u>www.dnr.wi.gov</u> OIPC website, <u>www.oipc.info</u>

Note: Maps of species' ranges are based on records as of 2010.

### **Aquatic Invasive Species**

## Flowering rush

Butomus umbellatus

### What is flowering rush?

Flowering rush (Butomus umbellatus L.) is a perennial aquatic plant, native to Europe and Asia. It grows along lake and river shores as an emergent plant. Emergent plants are rooted in the lake bottom with stems and leaves that grow above the surface of the water. A familiar emergent plant is cattail. Flowering rush may also grow as a nonflowering, submersed plant, growing below the surface of the water, with limp, ribbonlike leaves.

### How to identify it

Identification of flowering rush can be difficult, especially when the plants do not have flowers. It closely resembles many native emergent plants, such

as bulrush. The emergent form of flowering rush has three-angled fleshy leaves and may produce a cluster of pink flowers (Figure above and photo below).





### How does it spread?

Flowering rush has been sold as an ornamental garden plant and is most likely introduced into new waterbodies by humans. The plant spreads primarily by vegetative means, usually not by seed. Vegetative reproduction can result from growth of thick rhizomes, which are underground stems. Rhizomes also may produce small tubers or buds, which can disperse and grow into new plants. Also, small buds or "bulblets" that form in the clusters of flowers also can disperse and grow into new plants. Water currents, ice movement, muskrats, and geese can easily move these reproductive structures to new locations within a water body.

### Why is it a problem?

Dense stands of flowering rush may interfere with swimming and other use of lakes. Resource managers are concerned that flowering rush may become an aggressive competitor and displace native emergent vegetation, such as hardstem bulrush.

### Where is flowering rush in Minnesota?

Flowering rush was first recorded in Anoka County in 1968 and has since been located in these counties: Aitkin, Becker, Dakota, Hennepin, Itasca, Le Sueur, Rice, Todd, and Washington. Despite its 30-year presence in the state, the distribution of flowering rush is widely scattered and uncommon.

### **Regulatory Classification**

Flowering rush is classified as a *prohibited invasive species* in Minnesota. It is illegal to possess, buy, sell, transport, and plant.

### Management of flowering rush in MN

The DNR has two goals that apply to flowering rush management: 1) to prevent the spread of flowering rush within Minnesota; and 2) to reduce the impacts caused by invasive species to Minnesota's ecology, society, and economy.

## **Aquatic Invasive Species**

To attain these goals, the following four strategies are used:

- Prohibit the sale of flowering rush in Minnesota.
- Monitor current distribution and assess changes.
- Support research to develop and implement better management methods.
- Provide information to those interested in how to best manage flowering rush.

### **Control of Flowering Rush**

The Minnesota Department of Natural Resources (DNR) supports well-planned control of flowering rush. Nevertheless, lakeshore residents and users must ensure that control of this plant does not cause unintended harm, such as the removal of native bulrush. Native plants protect lake water quality and provide valuable fish and wildlife habitat. If you are a landowner who is interested in controlling flowering rush along your shoreline, you should be aware of the following:

### Removal of emergent aquatic plants, including flowering rush, in public waters requires a permit from the DNR. Anyone

who wants to control flowering rush must apply to the DNR for a permit. With proper justification, a DNR aquatic plant management permit may be issued to remove the invasive plant in order to provide reasonable use and access for landowners.

Invasive species often move into disturbed areas, for example, those from which native plants have been removed. Improper control methods can worsen the flowering rush problem. Information on control methods is given below.

**Hand digging** and removal will decrease the abundance of flowering rush. This method can be used to remove isolated plants but hand digging will also uproot rhizomes or buds, which can disperse and grow into new plants. Proper care must be taken to contain and remove all plant fragments from the water.

This side effect of hand digging means that this method may not be acceptable in all lakes.

**Cutting** flowering rush using both hand tools and mechanical devices below the water surface will not kill the plant but will decrease the abundance of visible foliage during the year of cutting. Multiple cuts may be required during the summer as flowering rush grows back from the root. Again, proper care must be taken to remove all cut plant fragments from the water and to keep mechanical devices from inadvertently uprooting rhizomes or buds from the lake bottom.

Herbicide treatments have been used to control flowering rush. At present, it is not clear whether any of the available herbicides can be used to provide long-lasting control without harming native plants growing with or near flowering rush. Efforts to improve control with herbicides are continuing. People considering control of flowering rush with herbicide should know that **any use of herbicide in public waters in Minnesota requires a DNR permit.** 

### Information and technical assistance

If you would like additional information on management of flowering rush or other, aquatic invasive species, contact the nearest DNR Invasive Species Program staff member:

Northwest MN, Park Rapids 218-699-7293

Northeast MN, Grand Rapids 218-999-7805

Central and West Central MN, Brainerd 218-833-8645; Fergus Falls 218-739-7576 ext. 259

Central and Southeast MN, St. Paul 651-259-5828

**Southern MN**, New Ulm 507-359-6079

Statewide, DNR Central Office -St. Paul 651-259-5100

