Appendix 10. Natural Resource Inventory Metadata

Davey Resource Group was commissioned by the Portage County Regional Planning Commission to identify, assess, and map the natural areas and open spaces in Portage County, Ohio. The findings will help County leaders and other stakeholders identify and preserve significant natural areas that are crucial in protecting water resources. Ultimately, these data will assist Portage County in the development of a watershed plan to protect and enhance watershed health.

Existing Resource Data

Ortho-rectified black and white aerials dated 2000 from U. S. Geological Survey (USGS) were used. These aerials were obtained in electronic format and were used in conjunction with the non-rectified color aerials that are also available from 2000. These two sets of aerials were the most important resource used in performing the open space inventory.

In addition, other available GIS data from U. S. Environmental Protection Agency (EPA), Ohio EPA, Youngstown State University, the Mahoning River Consortium, and other sources were obtained for the study. Satellite imagery from 1994 was also used.

Wetlands

All wetlands visible on the 2000 aerial photographs were identified and at a minimum, all wetlands greater than one acre were mapped. Wetlands were classified PEM, PSS, and PFO. These notations are derived from the U.S Fish and Wildlife Service's Cowardin Classification Method (1979) and are abbreviations for the following wetland community types:

- *Palustrine Emergent Marsh (PEM)* encompasses wet meadows and shallow and deep water marshes, both of which are typically comprised of perennial herbaceous plants such as rushes, reeds, and cattails.
- *Palustrine Scrub/Shrub (PSS)* wetland systems are typically dominated by willows, buttonbush, and/or low growing shrubs that are adapted to saturated soils or standing water.
- *Palustrine Forested (PFO)* wetland systems contain lowland woods and vernal pools and are typically dominated by oak, ash, and maple species.

Wetlands were mapped based on 2000 aerial photography and USGS topographic data. Aerial photograph interpretation was used to locate wetlands on the maps. Quality of the aerial photographs varied across Portage County. The accuracy of the wetlands layer varies according to local conditions and the quality of the aerial photographs. Approximately 50 to 70 percent of wetlands over 1 acre in size were mapped. Well-defined wetlands with standing water were easily mapped; whereas, wetlands with seasonally saturated soils (e.g., lowland woods) were more difficult to identify. Wetlands with seasonally saturated soils are more common in the flatter, eastern portion of the County.

The Portage County Soil Survey was consulted as appropriate when performing the wetlands identification and analysis. In addition, wetlands were field checked to verify the data; however, field checking was limited to areas visible from roadways.

To identify significant wetlands systems, each wetland mapped was evaluated for the presence of the following characteristics:

- *Large, undisturbed systems (Lg_undistu)*: Large, intact wetlands with a lack of disturbances are increasingly rare and noteworthy. Generally, disturbances to wetlands include logging, farming, surrounding development, gas/oil wells, and utility lines. Wetlands that were not significantly impacted by these activities were included in this category.
- *Important buffer roles (Imp_buffer)*: Many wetlands function as buffers to other natural areas. Wetlands located between natural areas and developed, farmed, or otherwise disturbed areas were assigned to this category.
- *Multiple vegetation community types (Multi_veg)*: Wetlands containing more than one vegetation community provide many different habitat types. Only wetlands with significant, natural communities were included in this category. For example, a lowland woods split by a cleared utility line with marsh vegetation would not qualify for multiple vegetation community types.
- *Vernal pools (Vernal_poo)*: Vernal pools are small depressions within forested wetlands that have standing water from late winter through summer. Vernal pools provide important habitat for amphibians and aquatic insects and are generally indicative of high quality wetlands. Forested wetlands with vernal pools were included in this category.
- *Proximity to mature upland woods and/or significant riparian corridors (Sig_prox)*: Wetlands adjacent to mature upland woods and within riparian corridors were included in this category. Numerous large complexes of wetlands, woodlands, and natural riparian corridors were noted throughout Portage County.
- *Connectivity to public parks and greenways (Connectiv)*: Wetlands that are all or partly within protected areas or adjacent to protected areas were included in this category. Portage County Regional Planning provided the protected areas data.
- *Other*: This category includes noteworthy comments regarding the identified wetland not included in the above categories. Examples include potential wetlands enhancement areas and areas that are a mosaic of wetlands and uplands.

Wetlands Delineations

Davey has performed on-site wetlands delineations throughout Portage County. All delineations that have been approved by the U. S. Army Corps of Engineers (USACE) were provided to the Portage County Regional Planning Commission, as these data are public record. These data were provided as individual shapefiles for each

USACE approved delineation prepared by Davey. Davey did not provide data for delineations not approved by USACE due to client confidentiality.

Wetlands Restoration and Enhancement

Opportunities for wetlands restoration were noted whenever possible. Wetlands restoration sites were identified based on aerial photographs and topographic data. Most of the restoration sites include agricultural fields with evidence of hydrological modifications such as ditching and tiling. Many of these areas are adjacent to existing wetlands. Other areas identified as restoration candidates are wetlands that have been filled, drained, or otherwise degraded.

Agricultural areas could be restored by a combination of ditch and tile removal along with construction of low berms and perhaps shallow excavation. Some areas lend themselves to the restoration of large wetlands, while other areas would be a mosaic of wetland and upland. When hydrology is modified, the effects on adjacent property owners must be considered.

Removal of fill and remediation of other disturbances to wetlands is more difficult. The limits of fill must first be determined and a plan for removal should be designed to avoid impacts to existing wetlands.

Controlling invasive plant species is a key issue in any wetlands restoration project. Herbicide is most often used as a control method. Mechanical control, such as mowing, burning, or hand pulling can also be used depending on the species.

Wetlands restoration and enhancement are complex issues that require site-specific investigations for each area. The above information provides general guidelines to restore and enhance wetlands.

Woodlands

Non-urban woodland resources were delineated based on 2000 color aerial photography as well as 2000 black and white USGS aerial photographs. Fencerows, back yards, and woodlands smaller than five acres were not mapped unless they were connected to riparian areas or wetlands. Woodlands were classified as early successional, late successional, mature, and conifer/pine. Furthermore, upland woods versus wetland woods were noted.

Common species found in upland areas include *Acer saccharum* (sugar maple), *Quercus rubra* (northern red oak), *Fagus grandifolia* (American beech), *Prunus serotina* (black cherry), and *Quercus alba* (white oak). Common species found in wetland and riparian forests include *Acer saccharinum* (silver maple), *Acer rubrum* (red maple), *Fraxinus pennsylvanica* (green ash), *Quercus palustris* (pin oak), and *Quercus bicolor* (swamp white oak).

Mature woodlands generally include areas where a majority of trees have a diameter at breast

height (DBH) greater than 18 inches. There are many forests in Portage County with trees greater than 18 inches DBH, but relatively few are dominated by these large trees. Most areas have been selectively logged or otherwise disturbed. Undisturbed mature forests are generally at least 100 years old.

Areas where the majority of trees have a DBH between 12 and 18 inches were included in the late successional woodlands. Early successional woodlands were classified as areas with trees less than 12 inches DBH.

Woodland size classes were based on aerial photograph interpretation. In many cases, it was difficult to discern tree sizes from the aerial photographs. Ground truthing revealed that many woodlands contain different sizes of trees. These woodlands were placed in the category that represented the majority of the trees; in most cases, these areas were late successional woodlands. In addition to the ground truthing, 1959 aerial photographs were obtained from the Portage County Natural Resources Conservation Service. The aerial photographs were used to compare the sizes of forested areas between 1959 and 2000, particularly in areas where the classification was unclear or where ground truthing was not possible.

To identify significant woodlands, each woodland mapped was evaluated for the presence of the following characteristics:

- *Large, undisturbed forest systems (Lg_undictu)*: Large, undisturbed blocks of forest are increasingly uncommon in Northeast Ohio and provide specific habitat requirements for a variety of plants and animals. Areas with a lack of disturbance such as logging, development, all-terrain vehicle use, gas/oil wells, and utility lines were included in this category.
- *Important buffer roles (Imp_buffer)*: Natural forested areas provide an important buffer function to other natural areas, particularly wetlands. Forests adjacent to other natural areas that appear to be providing important buffer functions were assigned to this category.
- *Multiple forest community types (Multi_fore)*: Forests with a variety of age classes, as well as both upland and wetland forests, are significant for the diversity of habitat that they provide. Woodlands with a variety of communities were included in this category.
- *Proximity to significant wetlands and/or riparian corridors (Sig_proxim)*: Forested areas adjacent to wetlands, as well as those that are part of or adjacent to riparian corridors, provide important wildlife habitat and migratory and dispersal corridors for plants and animals. Woodlands adjacent to these areas were placed in this category.
- *Other*: This category includes noteworthy comments regarding features not included in the above categories. The other category was used to denote large, high quality woodlands that would be suitable for preservation and/or parkland.

Riparian Corridors

In addition to utilizing the 2000 aerial photographs, 10-foot topography and water resource data from USGS were also analyzed. Davey utilized 2-foot contour data for Kent, Aurora, Streetsboro, and other areas as provided by Portage County Regional Planning Commission. Riparian corridors were identified for all streams and rivers shown on the USGS maps. Land use, topography, wetlands, FEMA floodplains, and vegetation community types all factor into determining the width of a stream's riparian zone.
Riparian corridors generally include the floodplain and associated valley slopes surrounding a stream. The riparian corridors include natural areas, as well as developed, disturbed, and farmed areas. Riparian corridors are well defined in areas of steep topography. In other areas with flatter topography, local drainage patterns, as well as the locations of nearby roads and developed areas were used as factors in determining the riparian corridor boundary.

Watersheds

Davey provided the Portage County Regional Planning Commission with a GIS shapefile of the sub-watersheds in the Mahoning, Tuscarawas, Chagrin, and Grand River watersheds to complement the current sub-watershed data that exists for the Cuyahoga River basin within Portage County.

Water Quality

U.S. EPA and Ohio EPA databases were queried for impaired waters and approved Total Maximum Daily Loads (TMDLs). Davey prepared GIS shapefiles of these data.

TMDLs specify the maximum limits of individual pollutants that may be discharged into a single waterway. Available TMDL data were obtained from U. S. EPA and Ohio EPA websites and mapped. Impaired waters from the Mahoning River, Cuyahoga River, Grand River, and the Tuscarawas River watersheds within Portage County named in the Section 303 (d) List of Prioritized Impaired Waters are included.

The source of these data is the Ohio 2004 Integrated Water Quality Monitoring and Assessment Report (Ohio EPA). The 2004 Section 303(d) List of Prioritized Impaired Waters is contained in Appendix B.2 of the Ohio EPA report. The Section 303(d) List is updated by Ohio EPA and submitted to U.S. EPA every two years.

Impervious Surfaces

Davey developed a GIS shapefile of impervious surfaces for Portage County by combining aerial remote sensing and satellite imagery. Large areas of impervious surfaces, including pavement, rooftops, and parking lots, were mapped. Small areas such as individual houses and driveways were not mapped.

Tiger/Line file data, Ohio Department of Natural Resources' 1994 land cover data, and National Oceanic and Atmosphere Administration (NOAA) Coastal Change Analysis

Program (C-CAP) data were used to develop the impervious surface data for Portage County.

Steep Slopes

Davey created a Triangulated Irregular Network (TIN) to identify steep slopes for Portage County using the 10-foot contour data available from the USGS. In addition, Davey created separate TINs for the portions of the County that have 2-foot contour data available. A TIN represents a geographic layer where space is partitioned into a set of non-overlapping triangles. Attribute and geometry information is stored for the points, lines, and faces that comprise each triangle. This information is used for display, query, and analysis purposes. A TIN provides a mathematical method for modeling three-dimensional surfaces using a two-dimensional triangle. The three points of each triangle are comprised of X and Y coordinates, which define the point's location in two-dimensional space, and a Z value defining the point's elevation. The faces of each triangle join at each point and collectively form the surface that being modeled.

To calculate the slope, the TIN was converted to a grid comprised of 10-foot square grid cells with an interpolated elevation value continued within each cell. The grid provides a semi-continuous measure of elevation over the entire study area, as opposed to elevation stored only at the TIN triangle points. Using an automated GIS software algorithm, slope was derived from this grid of elevation values. The algorithm identifies the degree of slope, or maximum rate of change, from each cell to its neighbors. The resulting grid represents the degree of slope (e.g., 10 degree slope) for each cell location. Area for each slope grid cell was automatically calculated and aggregated into categories.

Impaired Areas

Landfills, mining operations, and other large disturbances were mapped using aerial photograph interpretation. Large areas of barren soil such as construction sites, gravel pits, landfills, and other areas were mapped.

United States EPA databases were queried to obtain locations of Superfund sites and CERCLIS sites (Comprehensive Environmental Response, Compensation, and Liability Information System). These data were compiled in a separate shapefile.

Deliverables

One E-size hard copy of the wetlands, woodlands, riparian corridors, sub-watersheds, stream data, steep slopes, impervious surfaces, and impaired sites maps was prepared and provided to the Portage County Planning Commission. Each map layout was provided in a .pdf format for reprinting purposes. In addition, summary statistics for wetlands and woodlands were provided.

Each data layer was provided as an ArcView shapefile in Ohio North State Plane NAD 83 coordinate system. By using the ortho-rectified black and white USGS

data as the background maps, these shapefiles will be compatible with all future topographic or aerial photos that Portage County may obtain.

All final deliverables were provided digitally to the Portage County Regional Planning Commission via CD.

Acknowledgements

This project was made possible by a grant from the USDA Forest Service and Ohio Department of Natural Resources Division of Forestry with major financial contributions from the Portage County Board of Commissioners.