

Ecological Resources Assessment Report Lockheed Martin Site

Approximately 8.5 Acre Site,
Akron, Summit County, Ohio

Project # 34-2613

Prepared for:

ARCADIS
11000 Regency Parkway, West Tower, Suite 205
Cary, North Carolina 27518-8518
(919) 469-1952

Prepared by:



EnviroScience, Inc., 3781 Darrow Road, Stow OH 44224
(800) 940-4025 (330) 688-0111 FAX: (330)688-3858
www.enviroscienceinc.com

9 September 2008

STATEMENT OF CERTIFICATION

The analyses, opinions and conclusions in this report are based entirely on EnviroScience's unbiased, professional judgment. EnviroScience's compensation is not in any way contingent on any action or event resulting from this study. Neither EnviroScience nor any EnviroScience employee has any vested interest in the property examined in this study.



EnviroScience, Inc.
3781 Darrow Road
Stow, Ohio 44224 800-940-4025

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EXECUTIVE SUMMARY

In June and July 2008, Davey Resource Group provided wetland delineation services for ARCADIS on the Lockheed Martin Site. The site is located south of East Archwood Avenue, north of Triplett Boulevard, and west of Seiberling Avenue in Akron, Summit County, Ohio. EnviroScience, Inc. conducted an additional ecological resources site assessment in July 2008 to perform an assessment of previously delineated wetlands, a terrestrial habitat survey and a potential Indiana Bat habitat survey within site boundaries.

The site consists of three upland terrestrial habitat types: successional forest, scrub shrub, and urban area. The herbaceous habitat identified on project mapping represents the palustrine emergent portion of Wetland A delineated by Davey Resource Group. This habitat type was identified on project mapping only for the purposes of accurate calculations of all terrestrial habitat types onsite. The site also contains two types of wetland habitat: palustrine emergent and palustrine forested wetland habitat. Haley's Ditch flows north through the center of the study area. The study area is surrounded by urbanized area consisting of residential and commercial properties.

Three previously identified wetlands (Wetlands A, B and C) were assessed using the ORAM scoring forms. Wetland A was determined to be a Category 2 wetland, Wetland B was determined to fall within the Category 1 or 2 gray zone, and Wetland C was determined to be a Category 1 wetland. These wetlands are under the jurisdiction of the Ohio EPA or Corps. No filling may occur within these areas without their written permission. Please contact the Ohio EPA Division of Surface Water at (614) 644-2001 or the Buffalo District, U.S. Army Corps of Engineers, at (716) 879-4330 before working in these areas. Please refer to the Davey Resource Group Wetland Delineation Report, dated July 2008, for information regarding the previous site assessment.

Potential Indiana Bat roosting tree habitat was identified throughout the successional forest, scrub shrub and herbaceous wetland habitat portions of the study area. However, the Indiana Bat Mist Net Survey did not identify any Indiana Bats onsite. The survey identified one Big Brown Bat onsite. This species is not listed as an endangered, threatened or species of concern for Summit County, Ohio. Please refer to the EnviroScience Indiana Bat Survey Report for additional information on the Mist Net Survey.



1.0 INTRODUCTION AND SITE DESCRIPTION

In June and July 2008, Davey Resource Group provided wetland delineation services for ARCADIS on the Lockheed Martin Site. The site is located south of East Archwood Avenue, north of Triplett Boulevard, and west of Seiberling Avenue in Akron, Summit County, Ohio (Appendix A: Maps 1-3). EnviroScience, Inc. conducted an additional ecological resources site assessment in July 2008 to perform an assessment of previously delineated wetlands, a terrestrial habitat survey and a potential Indiana Bat habitat survey within site boundaries.

The site consists of three upland terrestrial habitat types: successional forest, scrub shrub, and urban area (Appendix A: Map 4) (Appendix C: Photos 1, 2, 4, and 5). The herbaceous habitat identified on project mapping represents the palustrine emergent portion of Wetland A (Appendix C: Photo 4) delineated by Davey Resource Group. This habitat type was identified on project mapping only for the purposes of accurate calculations of all terrestrial habitat types onsite. Additionally, two wetland habitat types were identified: palustrine emergent (PEM) and palustrine forested (PFO) (Appendix C: Photos 4, 6 and 7). Haley's Ditch flows north through the center of the study area (Appendix A: Map 4) (Appendix C: Photos 2 and 3). The study area is surrounded by urbanized area consisting of residential and commercial properties.

2.0 METHODS

Field surveys of the study area were conducted on July 24th and 25th, 2008. Wetland, terrestrial, and endangered species habitat were investigated. Following is a detailed discussion of specific methods employed.

2.1. Wetland Resources

The wetland resources investigation focused on three previously identified wetland systems (Wetlands A, B and C).

2.1.1. ORAM Categorization

Each previously identified wetland system was categorized in accordance with version 5.0 of the Ohio EPA's Ohio Rapid Assessment Method for Wetlands (ORAM) (Mack 2001). Each form consists of a narrative rating and a quantitative rating. The narrative rating requires ODNR Natural Heritage data, and serves to alert the rater of certain qualities that may have an obvious effect on the wetland category. The quantitative rating is based on wetland characteristics such as size, buffers, hydrology, disturbance and habitat. Scores from the quantitative rating produce a wetland category of 1-3, based on Mack (2000).

Category 1 wetlands are considered very low quality and are generally considered not restorable. They represent small emergent wetlands, which often



have a predominance of invasive/exotic species. Modified Category 2 wetlands are degraded systems that have potential to be restored, while Category 2 are medium quality systems which represent the majority of Ohio's wetlands. Category 3 wetlands are exceptional quality systems, such as large, undisturbed, forested wetlands, regionally significant ecosystems, and wetlands with known occurrences of endangered or threatened species.

2.2. Terrestrial Resources

Terrestrial resources in the study area were initially identified by examining topographic maps and aerial photos. While conducting field studies, notes were taken on plant community composition and flora. Vegetation cover types were noted on site mapping. These vegetation data were used to establish vegetation/habitat types found in the study area and to characterize quality of terrestrial habitats. Habitat boundaries were determined and these boundaries were then digitized into the base mapping and terrestrial habitat acreages were calculated.

2.2.1. Terrestrial Habitat Survey

A terrestrial habitat survey was completed to identify major plant communities. Mature nonwetland communities that had reached a stable equilibrium were classified according to Anderson (1982) and Gordon (1966, 1969). Disturbed and successional nonwetland communities were classified as one of the categories described in Table 1.

Table 1. Nonwetland Communities.

Community		Description
Disturbed	Urban	regularly maintained land; residential; industrial
	Agricultural	land used for producing crops or raising livestock; cropland; pastureland
	Cleared	disturbed areas devoid of most vegetation from recent clearing, grading or filling
Successional	New Field	herbaceous community without woody vegetation
	Old Field	herbaceous community having woody vegetation coverage of <50%
	Scrub Shrub	community dominated by woody vegetation <6 m (20 ft) tall
	Forest	community dominated by woody vegetation >6 m (20 ft) tall

3.0 ENDANGERED SPECIES

3.1. Potential Indiana Bat Habitat Survey

A potential Indiana Bat habitat survey was completed to identify habitat onsite.



3.2. ODNR Natural Heritage Database

The Ohio Department of Natural Resources, Division of Natural Areas and Preserves Natural Heritage Database was researched. No records of rare or endangered species exist within the study area; however, one record of the threatened Upland Sandpiper (*Bartramia longicauda*) was identified within a one mile radius of the study area (Appendix B: ODNR 2008).

There are no records of the federally endangered Indiana Bat (*Myotis sodalis*) capture locations or hibernacula within five miles of the site. Additionally, there are no state nature preserves or scenic rivers within the study area and no other unique ecological areas, geologic features, breeding or non-breeding animal concentrations, state parks, scenic rivers, or wildlife areas were noted.

3.3. U.S. Fish and Wildlife Service

The federally listed species whose range includes Summit County are the federally endangered Indiana Bat (*Myotis sodalis*), the federal species of concern bald eagle (*Haliaeetus leucocephalus*), and the federally threatened northern monkshood (*Aconitum noveboracense*).

The Indiana Bat is a federally endangered species with a summer range that includes Summit County. The Indiana Bat is migratory, using significantly different winter and summer habitats. Winter habitats include limestone mines and caves, where the bats hibernate. Summer habitat for the Indiana Bat includes live or standing dead trees or snags with exfoliating, peeling or loose bark, split trunks and/or branches, or cavities. Trees that support roosting habitat require an 8" diameter at breast height (dbh) or branches with a 6" diameter. Maternity trees require a 16" dbh or branches with an 8" diameter. Additionally, these trees require some solar exposure to provide thermoregulation to the young. Both maternity and roost trees require connection to a travel corridor to provide access to foraging areas. Potential Indiana Bat roosting tree habitat was identified throughout the successional forest, scrub shrub and herbaceous wetland habitat portions of the study area.

Bald eagles require foraging and perching areas, and nesting sites. Their habitat includes estuaries, large lakes, reservoirs, rivers and some seacoasts. In the winter, these birds congregate near open water in tall trees for spotting prey and night roosts for shelter. No evidence of bald eagles or their nests were found during the site visit.

Preferred habitat for northern monkshood is cool, moist, shaded cliff faces or talus slopes in wooded ravines, near water seeps; no preferred habitat was identified during field investigations.



4.0 RESULTS

The following section describes the results of the ecological resource assessment.

4.1. ORAM Categorization

Three previously identified wetlands were assessed using the Ohio Rapid Assessment Method (ORAM) for Wetlands v.5.0; scoring forms are included in Appendix D and results are given in Table 2 below.

Table 2. Wetland Results.

Wetland	Photo(s)	Classification (Cowardin et al. 1979)	ORAM Score	ORAM Category
Wetland A	4	PEM/PFO	52.5	2
Wetland B	6	PFO	31	1 or 2 gray zone
Wetland C	7	PEM	25.5	1

4.2. Terrestrial Habitat Survey

Three upland vegetative communities exist on the site: successional forest, scrub shrub and urban area habitat (Appendix A: Map 4) (Appendix C: Photos 1, 2, 4, and 5). The northern portion of the site consists primarily of successional forest as well as scrub shrub habitat. The central portion of the site consists primarily of urban area mowed grass with shrubs and herbaceous vegetation lining Haley's Ditch. The southern portion of the site consists primarily of successional forest as well as scrub shrub and urban area habitat types. The successional forest habitat type consists of approximately 4.88 acres, the scrub shrub habitat type consists of approximately 1.74 acres and the urban habitat type consists of approximately 1.52 acres. Two wetland habitat types, palustrine emergent (PEM) and palustrine forested (PFO) were also identified onsite. Please refer to the Davey Resource Group Wetland Delineation Report, dated July 2008, for information on these wetland habitats.

Common species found in the successional forest and scrub shrub habitat include *Acer saccharinum* (silver maple, FACW-), *Populus deltoides* (eastern cottonwood, FAC), *Prunus serotina* (black cherry, FACU), *Robinia pseudoacacia* (black locust, FACU-), and *Acer negundo* (box-elder, FAC+) in the tree canopy layer; *Crataegus sp.* (hawthorn), *Cornus foemina* (gray dogwood, FAC), *Lonicera tatarica* (Tartarian honeysuckle, FACU), *Rosa multiflora* (multiflora rose, FACU), and *Rhamnus frangula* (glossy buckthorn, FAC) in the shrub layer; *Alliaria petiolata* (garlic mustard, FACU-), *Impatiens capensis* (spotted touch-me-not, FACW), and *Toxicodendron radicans* (poison ivy, FAC) in the herbaceous layer; *Vitis riparia* (river-bank grape, FACW) and *Parthenocissus quinquefolia* (Virginia creeper, FACU) in the vine layer.

Common species found in the urban area habitat include *Cirsium arvense* (creeping thistle, FACU), *Coronilla varia* (crownvetch, FACU), *Lonicera tatarica*, *Rosa multiflora*, and *Solidago canadensis* (Canada goldenrod, FACU).

4.3. Potential Indiana Bat Habitat Survey

Potential Indiana Bat maternity and roost tree habitat was identified throughout the successional forest, scrub shrub and herbaceous wetland habitat portions of the study area (Appendix C: Photos 8 and 9). However, no Indiana Bats were observed during the mist net survey, only one Big Brown Bat (*Eptesicus fuscus*) was observed. Please refer to the Indiana Bat Survey Report conducted by EnviroScience, Inc. in July 2008.

5.0 REGULATORY JURISDICTION

The wetlands habitats described in this document are under the jurisdiction either of the U.S. Army Corps of Engineers or the Ohio EPA. No filling may occur in these areas without their written permission. Please contact the Ohio EPA Division of Surface Water at (614) 644-2001 or the Buffalo District, U.S. Army Corps of Engineers, at (716) 879-4330 before working in these areas.

The following information is excerpted and summarized from the 2007 *U.S. Army Corps Of Engineers Jurisdictional Determination Form Instructional Guidebook*.

“In 2001, the ... U.S. Supreme Court’s decision in the *Solid Waste Agency of Northern Cook County (SWANCC) v. Corps...* held that isolated, intrastate, non-navigable waters could not be regulated under the CWA based solely on the presence of migratory birds. Following the SWANCC decision ... it generally was believed that a water body (including a wetland) was subject to CWA jurisdiction if the water body was part of the U.S. territorial seas, or a traditional navigable water, or any tributary to a traditional navigable water, or a wetland adjacent to any one of the above. In addition, isolated wetlands and other waters might be considered jurisdictional where they had the necessary link to either navigable waters or interstate commerce.”

In the state of Ohio, the Ohio EPA isolated wetland permitting program was legislatively created in response to the 2001 SWANCC decision. On July 17, 2001, House Bill 231 was signed into law, establishing a permanent permitting process for isolated wetlands. The provisions of House Bill 231 were incorporated in Sections 6111.021 through 6111.029 of the Ohio Revised Code.

“In 2006, the Supreme Court once again addressed the jurisdictional scope of Section 404 of the CWA, specifically the term “the waters of the



The decision provides two new analytical standards for determining whether water bodies that are not traditional navigable waters (TNWs), including wetlands adjacent to those non-TNWs, are subject to CWA jurisdiction: (1) if the water body is relatively permanent, or if the water body is a wetland that directly abuts (e.g., the wetland is not separated from the tributary by uplands, a berm, dike, or similar feature) a relatively permanent water body (RPW), or (2) if a water body, in combination with all wetlands adjacent to that water body, has a significant nexus with TNWs. CWA jurisdiction over TNWs and their adjacent wetlands was not in question in this case, and, therefore, was not affected by the Rapanos decision. In addition, at least five of the Justices in Rapanos agreed that CWA jurisdiction exists over all TNWs and over all wetlands adjacent to TNWs.

The Memo states that the [Corps and USEPA] will assert jurisdiction over the following categories of water bodies: TNWs; all wetlands adjacent to TNWs; non-navigable tributaries of TNWs that are relatively permanent (i.e., tributaries that typically flow year-round or have continuous flow at least seasonally); and wetlands that directly abut such tributaries. In addition, the agencies will assert jurisdiction over every water body that is not an RPW if that water body is determined (on the basis of a fact-specific analysis) to have a significant nexus with a TNW. The classes of water body that are subject to CWA jurisdiction only if such a significant nexus is demonstrated are: non-navigable tributaries that do not typically flow year-round or have continuous flow at least seasonally; wetlands adjacent to such tributaries; and wetlands adjacent to but that do not directly abut a relatively permanent, non-navigable tributary. A significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or an insubstantial effect on the chemical, physical, and/or biological, integrity of a TNW. Principal considerations when evaluating significant nexus include the volume, duration, and frequency of the flow of water in the tributary and the proximity of the tributary to a TNW, plus the hydrologic, ecologic, and other functions performed by the tributary and all of its adjacent wetlands.”

6.0 ASSUMPTIONS AND DISCLAIMERS

The results and conclusions contained in this report apply to the year and date in which the data were collected. This report is not considered officially valid until it is approved by the Corps. The report is then valid for a period of five years. Refer to the Corps' Regulatory Guidance Letter # 94-1 (23 May 1994).



EnviroScience, Inc.
3781 Darrow Road
Stow, Ohio 44224 800-940-4025

REFERENCES

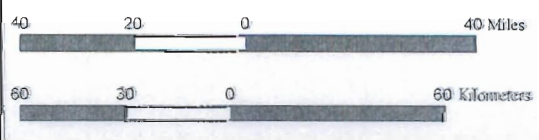
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Appendix A:
Maps

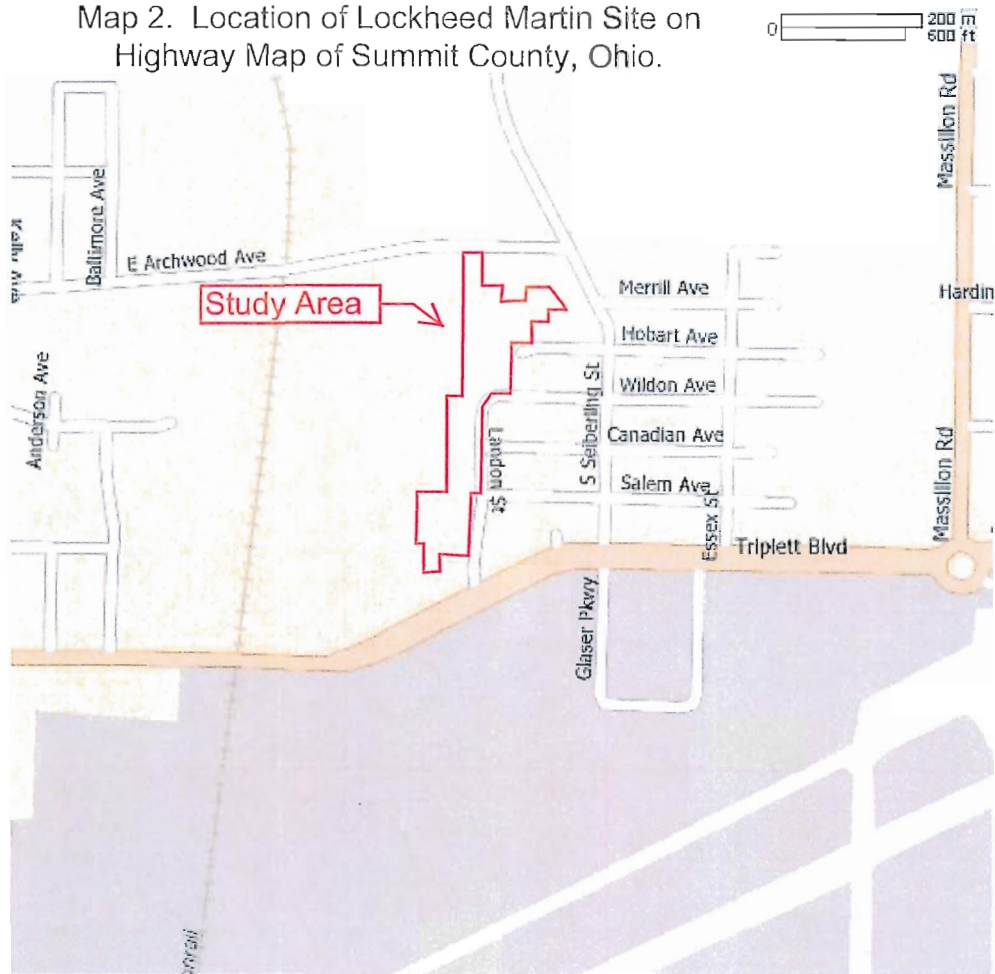


Map 1. Location of Summit County, Ohio

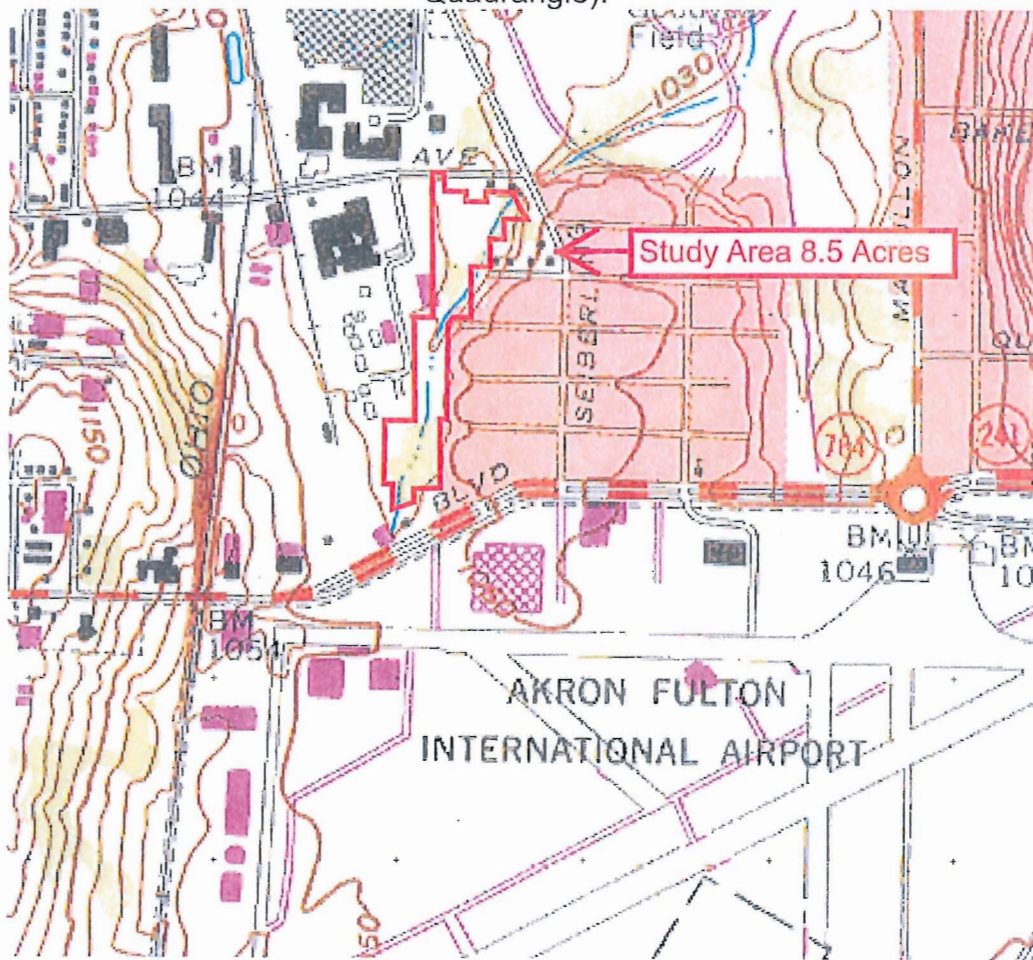


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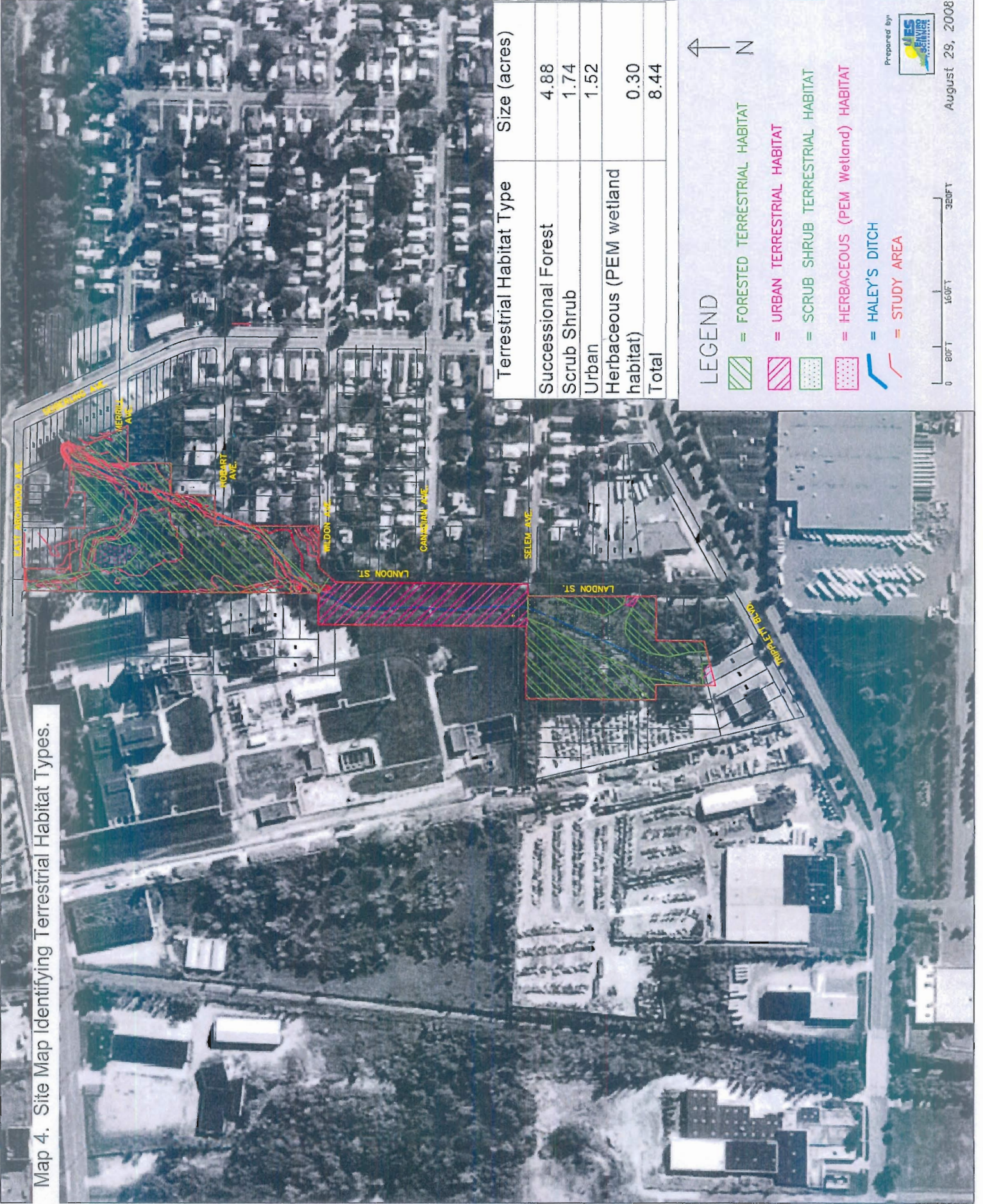
Map 2. Location of Lockheed Martin Site on Highway Map of Summit County, Ohio.



Map 3. USGS 7.5-minute Topographic Map of Site (Akron East Quadrangle).



Map 4. Site Map Identifying Terrestrial Habitat Types.



Appendix B:
Natural Heritage Database Information



Ohio Department of Natural Resources

TED STRICKLAND, GOVERNOR

SEAN D. LOGAN, DIRECTOR

Division of Natural Areas and Preserves
Steven D. Maurer, Chief
2045 Morse Rd., Bldg. F-1
Columbus, OH 43229-6693
Phone: (614) 265-6453; Fax: (614) 267-3096

August 18, 2008

Brooke Harrison
EnviroScience, Inc.
3781 Darrow Rd.
Stow, OH 44224

Dear Ms. Harrison:

I have reviewed our Natural Heritage maps and files for the Arcadis remediation project area, including a one mile radius, on Archwood Ave. in Akron, Summit County, and on the Akron East Quad (2613). We have no records for rare or endangered species or other significant natural features within the project area. However, we have one record within the one mile radius of the project site. The location for the Upland Sandpiper (*Bartramia longicauda*), threatened, is shown in red on the attached map.

There are no state nature preserves or scenic rivers at the project site. We are unaware of any unique ecological sites, geologic features, animal assemblages, state parks, state forests or state wildlife areas within a one mile radius of the project area. We also have no records for Indiana Bat (*Myotis sodalis*, state endangered, federal endangered) capture locations or hibernacula within a five mile radius of the project site.

Our inventory program has not completely surveyed Ohio and relies on information supplied by many individuals and organizations. Therefore, a lack of records for any particular area is not a statement that rare species or unique features are absent from that area. Please note that although we inventory all types of plant communities, we only maintain records on the highest quality areas.

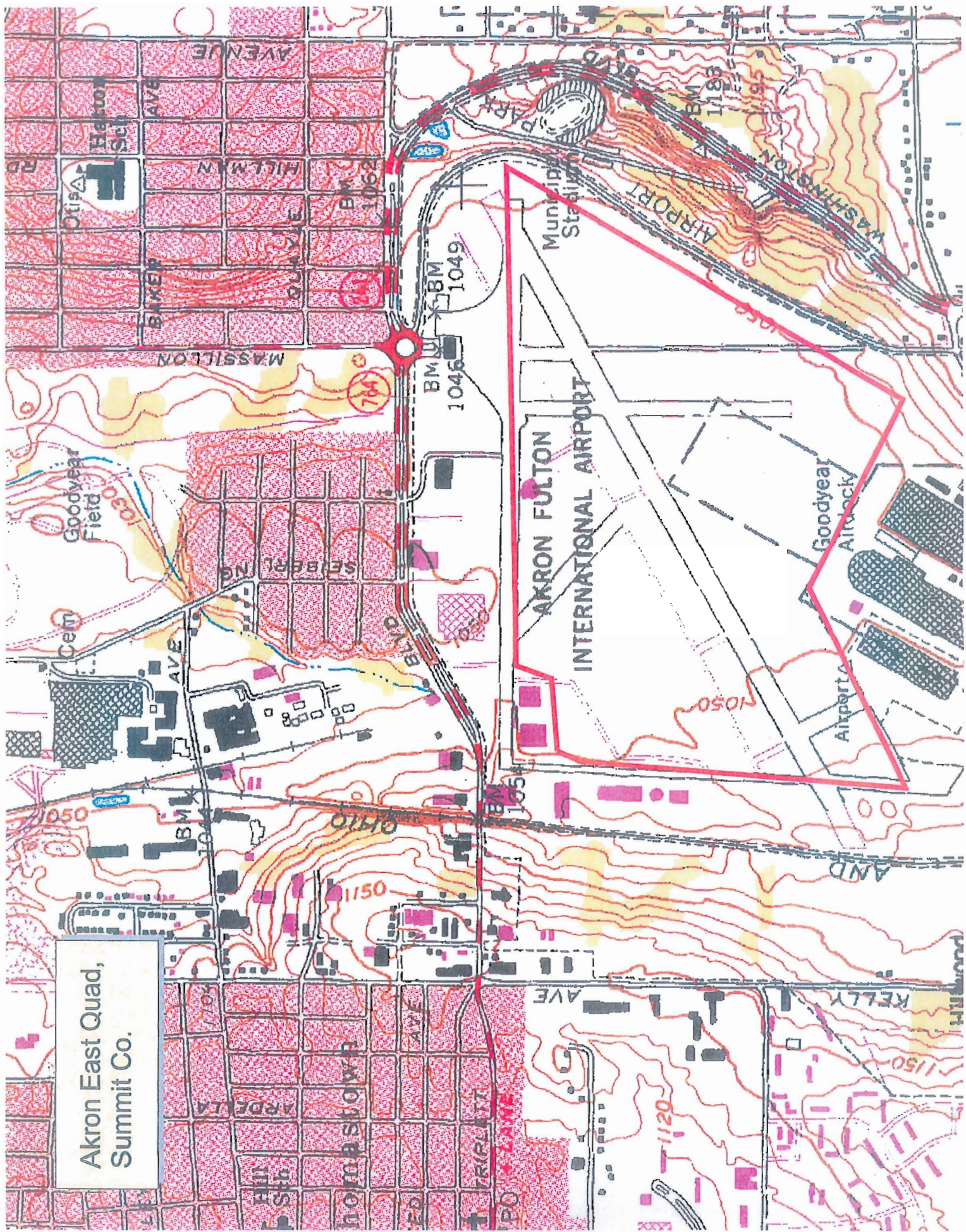
Please contact me at 614-265-6818 if I can be of further assistance.

Sincerely,

A handwritten signature in blue ink that reads "Debbie Woischke".

Debbie Woischke, Ecological Analyst
Natural Heritage Program





Akron East Quad,
Summit Co.

Appendix C:
Photographs



Photo 1. Facing north, central portion of the site along the left side of the fence, Landon Road visible to the right of the fence.



Photo 2. Facing west, urban area terrestrial habitat located in the central portion of the study area. Haley's Ditch is visible and is lined with vegetation.



Photo 3. Haley's Ditch flowing northwards through the site.



Photo 4. View of Wetland A and successional forest habitat surrounding the wetland.



Photo 5. View of scrub-shrub habitat.



Photo 6. View of Wetland B.



Photo 7. View of Wetland C.



Photo 8. Potential Indiana Bat roosting tree habitat.



Photo 9. Potential Indiana Bat roosting tree habitat.

Appendix D:

**Ohio Rapid Assessment Method for Wetlands v. 5.0 Rating
Forms**

Site: Haleys Ditch Restoration	Rater(s): B. Harrison/M. Liptak	Date: 7/24/08
---------------------------------------	--	----------------------

2	2
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

- >50 acres (>20.2ha) (6 pts)
- 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- 10 to <25 acres (4 to <10.1ha) (4 pts)
- 3 to <10 acres (1.2 to <4ha) (3 pts)
- 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- <0.1 acres (0.04ha) (0 pts)

7	9
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- LOW. Old field (>10 years), shrubland, young second growth forest. (5)
- MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

15.5	24.5
max 30 pts.	subtotal

Metric 3. Hydrology.

3a. Sources of Water. Score all that apply.

- High pH groundwater (5)
- Other groundwater (3)
- Precipitation (1)
- Seasonal/Intermittent surface water (3)
- Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select only one and assign score.

- >0.7 (27.6in) (3)
- 0.4 to 0.7m (15.7 to 27.6in) (2)
- <0.4m (<15.7in) (1)

3b. Connectivity. Score all that apply.

- 100 year floodplain (1)
- Between stream/lake and other human use (1)
- Part of wetland/upland (e.g. forest), complex (1)
- Part of riparian or upland corridor (1)

3d. Duration inundation/saturation. Score one or dbl check.

- Semi- to permanently inundated/saturated (4)
- Regularly inundated/saturated (3)
- Seasonally inundated (2)
- Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

<ul style="list-style-type: none"> <input type="checkbox"/> None or none apparent (12) <input checked="" type="checkbox"/> Recovered (7) <input type="checkbox"/> Recovering (3) <input type="checkbox"/> Recent or no recovery (1) 	<p>Check all disturbances observed</p> <table style="width:100%;"> <tr> <td><input type="checkbox"/> ditch</td> <td><input type="checkbox"/> point source (nonstormwater)</td> </tr> <tr> <td><input type="checkbox"/> tile</td> <td><input type="checkbox"/> filling/grading</td> </tr> <tr> <td><input type="checkbox"/> dike</td> <td><input type="checkbox"/> road bed/RR track</td> </tr> <tr> <td><input type="checkbox"/> weir</td> <td><input type="checkbox"/> dredging</td> </tr> <tr> <td><input type="checkbox"/> stormwater input</td> <td><input checked="" type="checkbox"/> other_SANITARY SEWER</td> </tr> </table>	<input type="checkbox"/> ditch	<input type="checkbox"/> point source (nonstormwater)	<input type="checkbox"/> tile	<input type="checkbox"/> filling/grading	<input type="checkbox"/> dike	<input type="checkbox"/> road bed/RR track	<input type="checkbox"/> weir	<input type="checkbox"/> dredging	<input type="checkbox"/> stormwater input	<input checked="" type="checkbox"/> other_SANITARY SEWER
<input type="checkbox"/> ditch	<input type="checkbox"/> point source (nonstormwater)										
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<input type="checkbox"/> stormwater input	<input checked="" type="checkbox"/> other_SANITARY SEWER										

11	35.5
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.

- None or none apparent (4)
- Recovered (3)
- Recovering (2)
- Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- Excellent (7)
- Very good (6)
- Good (5)
- Moderately good (4)
- Fair (3)
- Poor to fair (2)
- Poor (1)

4c. Habitat alteration. Score one or double check and average.

<ul style="list-style-type: none"> <input type="checkbox"/> None or none apparent (9) <input checked="" type="checkbox"/> Recovered (6) <input checked="" type="checkbox"/> Recovering (3) <input type="checkbox"/> Recent or no recovery (1) 	<p>Check all disturbances observed</p> <table style="width:100%;"> <tr> <td><input type="checkbox"/> mowing</td> <td><input type="checkbox"/> shrub/sapling removal</td> </tr> <tr> <td><input type="checkbox"/> grazing</td> <td><input type="checkbox"/> herbaceous/aquatic bed removal</td> </tr> <tr> <td><input checked="" type="checkbox"/> clearcutting</td> <td><input type="checkbox"/> sedimentation</td> </tr> <tr> <td><input type="checkbox"/> selective cutting</td> <td><input type="checkbox"/> dredging</td> </tr> <tr> <td><input type="checkbox"/> woody debris removal</td> <td><input type="checkbox"/> farming</td> </tr> <tr> <td><input type="checkbox"/> toxic pollutants</td> <td><input type="checkbox"/> nutrient enrichment</td> </tr> </table>	<input type="checkbox"/> mowing	<input type="checkbox"/> shrub/sapling removal	<input type="checkbox"/> grazing	<input type="checkbox"/> herbaceous/aquatic bed removal	<input checked="" type="checkbox"/> clearcutting	<input type="checkbox"/> sedimentation	<input type="checkbox"/> selective cutting	<input type="checkbox"/> dredging	<input type="checkbox"/> woody debris removal	<input type="checkbox"/> farming	<input type="checkbox"/> toxic pollutants	<input type="checkbox"/> nutrient enrichment
<input type="checkbox"/> mowing	<input type="checkbox"/> shrub/sapling removal												
<input type="checkbox"/> grazing	<input type="checkbox"/> herbaceous/aquatic bed removal												
<input checked="" type="checkbox"/> clearcutting	<input type="checkbox"/> sedimentation												
<input type="checkbox"/> selective cutting	<input type="checkbox"/> dredging												
<input type="checkbox"/> woody debris removal	<input type="checkbox"/> farming												
<input type="checkbox"/> toxic pollutants	<input type="checkbox"/> nutrient enrichment												

35.5

subtotal this page

Site: Haleys Ditch Restoration	Rater(s): B. Harrison/M. Liptak	Date: 7/24/08
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0	0
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

- Select one size class and assign score.
- >50 acres (>20.2ha) (6 pts)
 - 25 to <50 acres (10.1 to <20.2ha) (5 pts)
 - 10 to <25 acres (4 to <10.1ha) (4 pts)
 - 3 to <10 acres (1.2 to <4ha) (3 pts)
 - 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
 - 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
 - <0.1 acres (0.04ha) (0 pts)

7	7
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

- 2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
 - MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
 - NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
 - VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)
- 2b. Intensity of surrounding land use. Select one or double check and average.
- VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
 - LOW. Old field (>10 years), shrubland, young second growth forest. (5)
 - MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
 - HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

14	21
max 30 pts.	subtotal

Metric 3. Hydrology.

- 3a. Sources of Water. Score all that apply.
- High pH groundwater (5)
 - Other groundwater (3)
 - Precipitation (1)
 - Seasonal/intermittent surface water (3)
 - Perennial surface water (lake or stream) (5)
- 3b. Connectivity. Score all that apply.
- 100 year floodplain (1)
 - Between stream/lake and other human use (1)
 - Part of wetland/upland (e.g. forest), complex (1)
 - Part of riparian or upland corridor (1)
- 3c. Maximum water depth. Select only one and assign score.
- >0.7 (27.6in) (3)
 - 0.4 to 0.7m (15.7 to 27.6in) (2)
 - <0.4m (<15.7in) (1)
- 3d. Duration inundation/saturation. Score one or dbl check.
- Semi- to permanently inundated/saturated (4)
 - Regularly inundated/saturated (3)
 - Seasonally inundated (2)
 - Seasonally saturated in upper 30cm (12in) (1)
- 3e. Modifications to natural hydrologic regime. Score one or double check and average.
- | | |
|--|--|
| <ul style="list-style-type: none"> <input type="checkbox"/> None or none apparent (12) <input checked="" type="checkbox"/> Recovered (7) <input checked="" type="checkbox"/> Recovering (3) <input type="checkbox"/> Recent or no recovery (1) | <p>Check all disturbances observed</p> <ul style="list-style-type: none"> <input type="checkbox"/> ditch <input type="checkbox"/> tile <input type="checkbox"/> dike <input type="checkbox"/> weir <input checked="" type="checkbox"/> stormwater input |
|--|--|

10	31
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

- 4a. Substrate disturbance. Score one or double check and average.
- None or none apparent (4)
 - Recovered (3)
 - Recovering (2)
 - Recent or no recovery (1)
- 4b. Habitat development. Select only one and assign score.
- Excellent (7)
 - Very good (6)
 - Good (5)
 - Moderately good (4)
 - Fair (3)
 - Poor to fair (2)
 - Poor (1)
- 4c. Habitat alteration. Score one or double check and average.
- | | | | |
|--|---|--|---|
| <ul style="list-style-type: none"> <input type="checkbox"/> None or none apparent (9) <input checked="" type="checkbox"/> Recovered (6) <input checked="" type="checkbox"/> Recovering (3) <input type="checkbox"/> Recent or no recovery (1) | <p>Check all disturbances observed</p> <table style="width:100%;"> <tr> <td style="width:50%; vertical-align: top;"> <ul style="list-style-type: none"> <input type="checkbox"/> mowing <input type="checkbox"/> grazing <input type="checkbox"/> clearcutting <input type="checkbox"/> selective cutting <input type="checkbox"/> woody debris removal <input type="checkbox"/> toxic pollutants </td> <td style="width:50%; vertical-align: top;"> <ul style="list-style-type: none"> <input type="checkbox"/> shrub/sapling removal <input checked="" type="checkbox"/> herbaceous/aquatic bed removal <input type="checkbox"/> sedimentation <input type="checkbox"/> dredging <input type="checkbox"/> farming <input type="checkbox"/> nutrient enrichment </td> </tr> </table> | <ul style="list-style-type: none"> <input type="checkbox"/> mowing <input type="checkbox"/> grazing <input type="checkbox"/> clearcutting <input type="checkbox"/> selective cutting <input type="checkbox"/> woody debris removal <input type="checkbox"/> toxic pollutants | <ul style="list-style-type: none"> <input type="checkbox"/> shrub/sapling removal <input checked="" type="checkbox"/> herbaceous/aquatic bed removal <input type="checkbox"/> sedimentation <input type="checkbox"/> dredging <input type="checkbox"/> farming <input type="checkbox"/> nutrient enrichment |
| <ul style="list-style-type: none"> <input type="checkbox"/> mowing <input type="checkbox"/> grazing <input type="checkbox"/> clearcutting <input type="checkbox"/> selective cutting <input type="checkbox"/> woody debris removal <input type="checkbox"/> toxic pollutants | <ul style="list-style-type: none"> <input type="checkbox"/> shrub/sapling removal <input checked="" type="checkbox"/> herbaceous/aquatic bed removal <input type="checkbox"/> sedimentation <input type="checkbox"/> dredging <input type="checkbox"/> farming <input type="checkbox"/> nutrient enrichment | | |

31

subtotal this page

Site: Haleys Ditch Restoration	Rater(s): B. Harrison/M. Liptak	Date: 7/24/08
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0	0
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

- >50 acres (>20.2ha) (6 pts)
- 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- 10 to <25 acres (4 to <10.1ha) (4 pts)
- 3 to <10 acres (1.2 to <4ha) (3 pts)
- 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- <0.1 acres (0.04ha) (0 pts)

4	4
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- LOW. Old field (>10 years), shrubland, young second growth forest. (5)
- MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

15	19
max 30 pts.	subtotal

Metric 3. Hydrology.

3a. Sources of Water. Score all that apply.

- High pH groundwater (5)
- Other groundwater (3)
- Precipitation (1)
- Seasonal/intermittent surface water (3)
- Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select only one and assign score.

- >0.7 (27.6in) (3)
- 0.4 to 0.7m (15.7 to 27.6in) (2)
- <0.4m (<15.7in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- None or none apparent (12)
- Recovered (7)
- Recovering (3)
- Recent or no recovery (1)

Check all disturbances observed

- ditch
- tile
- dike
- weir
- stormwater input

3b. Connectivity. Score all that apply.

- 100 year floodplain (1)
- Between stream/lake and other human use (1)
- Part of wetland/upland (e.g. forest), complex (1)
- Part of riparian or upland corridor (1)

3d. Duration inundation/saturation. Score one or dbl check.

- Semi- to permanently inundated/saturated (4)
- Regularly inundated/saturated (3)
- Seasonally inundated (2)
- Seasonally saturated in upper 30cm (12in) (1)

6.5	25.5
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.

- None or none apparent (4)
- Recovered (3)
- Recovering (2)
- Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- Excellent (7)
- Very good (6)
- Good (5)
- Moderately good (4)
- Fair (3)
- Poor to fair (2)
- Poor (1)

4c. Habitat alteration. Score one or double check and average.

- None or none apparent (9)
- Recovered (6)
- Recovering (3)
- Recent or no recovery (1)

Check all disturbances observed

- | | |
|--|---|
| <ul style="list-style-type: none"> <input type="checkbox"/> mowing <input type="checkbox"/> grazing <input type="checkbox"/> clearcutting <input type="checkbox"/> selective cutting <input type="checkbox"/> woody debris removal <input type="checkbox"/> toxic pollutants | <ul style="list-style-type: none"> <input type="checkbox"/> shrub/sapling removal <input checked="" type="checkbox"/> herbaceous/aquatic bed removal <input type="checkbox"/> sedimentation <input type="checkbox"/> dredging <input type="checkbox"/> farming <input type="checkbox"/> nutrient enrichment |
|--|---|

25.5

subtotal, this page