

Large Filing Separator Sheet

Case Number: 17-328-GA-BLN

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Section: 2 of 3

Number of Pages: 200

Description of Document: Letter of
Notification

Table 1. Characteristic plant species.

invasive/exotic spp	fen species	bog species	Oak Opening species	wet prairie species
<i>Lythrum salicaria</i>	<i>Zygadenus elegans</i> var. <i>glaucus</i>	<i>Calla palustris</i>	<i>Carex cryptolepis</i>	<i>Calamagrostis canadensis</i>
<i>Myriophyllum spicatum</i>	<i>Cacalia plantaginea</i>	<i>Carex atlantica</i> var. <i>capillacea</i>	<i>Carex lasiocarpa</i>	<i>Calamagrostis stricta</i>
<i>Najas minor</i>	<i>Carex flava</i>	<i>Carex echinata</i>	<i>Carex stricta</i>	<i>Carex atherodes</i>
<i>Phalaris arundinacea</i>	<i>Carex sterilis</i>	<i>Carex oligosperma</i>	<i>Cladium mariscoides</i>	<i>Carex buxbaumii</i>
<i>Phragmites australis</i>	<i>Carex stricta</i>	<i>Carex trisperma</i>	<i>Calamagrostis stricta</i>	<i>Carex pellita</i>
<i>Potamogeton crispus</i>	<i>Deschampsia caespitosa</i>	<i>Chamaedaphne calyculata</i>	<i>Calamagrostis canadensis</i>	<i>Carex sartwellii</i>
<i>Ranunculus ficaria</i>	<i>Eleocharis rostellata</i>	<i>Decodon verticillatus</i>	<i>Quercus palustris</i>	<i>Gentiana andrewsii</i>
<i>Rhamnus frangula</i>	<i>Eriophorum viridicarinatum</i>	<i>Eriophorum virginicum</i>		<i>Helianthus grosseserratus</i>
<i>Typha angustifolia</i>	<i>Gentianopsis</i> spp.	<i>Larix laricina</i>		<i>Liatris spicata</i>
<i>Typha xglauca</i>	<i>Lobelia kalmit</i>	<i>Nemopanthus mucronatus</i>		<i>Lysimachia quadriflora</i>
	<i>Parnassia glauca</i>	<i>Scheuchzeria palustris</i>		<i>Lythrum alatum</i>
	<i>Potentilla fruticosa</i>	<i>Sphagnum</i> spp.		<i>Pycnanthemum virginianum</i>
	<i>Rhamnus alnifolia</i>	<i>Vaccinium macrocarpon</i>		<i>Silphium terebinthinaceum</i>
	<i>Rhynchospora capillacea</i>	<i>Vaccinium corymbosum</i>		<i>Sorghastrum nutans</i>
	<i>Salix candida</i>	<i>Vaccinium oxycoccos</i>		<i>Spartina pectinata</i>
	<i>Salix myricoides</i>	<i>Woodwardia virginica</i>		<i>Solidago riddellii</i>
	<i>Salix serotima</i>	<i>Xyris difformis</i>		
	<i>Solidago ohioensis</i>			
	<i>Tofieldia glutinosa</i>			
	<i>Triglochin maritimum</i>			
	<i>Triglochin palustre</i>			

End of Narrative Rating. Begin Quantitative Rating on next page.

Site: Wetland 2 Rater(s): JAV/DMG (CEC) Date: 5/18/2016

Metric 1. Wetland Area (size).

2 2
max 6 pts subtotal

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)

5 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), shrub land, 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)

16 23
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)

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)

Check all disturbances observed

- ☐ ditch
☐ tile
☐ dike
☐ weir
☐ stormwater input

- ☒ point source (nonstormwater)
☒ filling/grading
☐ road bed/RR track
☐ dredging
☐ other

12.5 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.

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

Check all disturbances observed

- ☒ mowing
☐ grazing
☒ clearcutting
☒ selective cutting
☒ woody debris removal
☐ toxic pollutants

- ☒ shrub/sapling removal
☐ herbaceous/aquatic bed removal
☐ sedimentation
☐ dredging
☐ farming
☐ nutrient enrichment

35.5
subtotal this page

Site: Wetland 2 Rater(s): JAV/DMG (CEC) Date: 5/18/2016

35.5
subtotal first page

5 40.5 **Metric 5. Special Wetlands.**

max 10 pts.

subtotal

Check all that apply and score as indicated.

- ☐ Bog (10)
- ☐ Fen (10)
- ☐ Old growth forest (10)
- ☒ Mature forested wetland (5)
- ☐ Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- ☐ Lake Erie coastal/tributary wetland-restricted hydrology (5)
- ☐ Lake Plain Sand Prairies (Oak Openings) (10)
- ☐ Relict Wet Prairies (10)
- ☐ Known occurrence state/federal threatened or endangered species (10)
- ☐ Significant migratory songbird/water fowl habitat or usage (10)
- ☐ Category 1 Wetland. See Question 1 Qualitative Rating (-10)

12 52.5 **Metric 6. Plant communities, interspersions, microtopography.**

max 20 pts.

subtotal

6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- ☐ Aquatic bed
- 1 ☒ Emergent
- 1 ☒ Shrub
- 3 ☒ Forest
- ☐ Mudflats
- ☐ Open water
- ☐ Other

6b. horizontal (plan view) Interspersion.

Select only one.

- ☐ High (5)
- ☐ Moderately high (4)
- 3 ☒ Moderate (3)
- ☐ Moderately low (2)
- ☐ Low (1)
- ☐ None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- ☐ Extensive >75% cover (-5)
- ☐ Moderate 25-75% cover (-3)
- ☐ Sparse 5-25% cover (-1)
- 0 ☒ Nearly absent <5% cover (0)
- ☐ Absent (1)

6d. Microtopography.

Score all present using 0 to 3 scale.

- 0 ☒ Vegetated hummocks/tussocks
- 3 ☒ Coarse woody debris >15cm (6in)
- 1 ☒ Standing dead >25cm (10in) dbh
- 4 ☒ Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp.
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

52.5

End of Quantitative Rating. Complete Categorization Worksheets.

ORAM Summary Worksheet

Wetland 2

		circle answer or insert score	Result
Narrative Rating	Question 1. Critical Habitat	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES <input checked="" type="radio"/> NO	If yes, Category 1.
	Question 6. Bogs	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 7. Fens	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 8b. Mature Forested Wetland	<input checked="" type="radio"/> YES <input type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands - Unrestricted with native plants	YES <input checked="" type="radio"/> NO	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.
Question 10. Oak Openings	YES <input checked="" type="radio"/> NO	If yes, Category 3	
Question 11. Relict Wet Prairies	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.	
Quantitative Rating	Metric 1. Size	2	
	Metric 2. Buffers and surrounding land use	5	
	Metric 3. Hydrology	16	
	Metric 4. Habitat	12.5	
	Metric 5. Special Wetland Communities	5	
	Metric 6. Plant communities, interspersion, microtopography	12	
	TOTAL SCORE	52.5	Category based on score breakpoints 2

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

Choices	Circle one	Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	YES Wetland is categorized as a Category 3 wetland	<input checked="" type="radio"/> NO Is quantitative rating score <i>less</i> than the Category 2 scoring threshold (<i>excluding</i> gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	<input checked="" type="radio"/> YES Wetland should be evaluated for possible Category 3 status	NO Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.
Did you answer "Yes" to Narrative Rating No. 5	YES Wetland is categorized as a Category 1 wetland	<input checked="" type="radio"/> NO Is quantitative rating score <i>greater</i> than the Category 2 scoring threshold (<i>including</i> any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	<input checked="" type="radio"/> YES Wetland is assigned to the appropriate category based on the scoring range	NO If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.
Does the quantitative score fall within the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?	YES Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	<input checked="" type="radio"/> NO Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc, and a consideration of the narrative criteria in OAC rule 3745-1-54(C).
Does the wetland otherwise exhibit <i>moderate OR superior</i> hydrologic OR habitat, OR recreational functions AND the wetland was <i>not</i> categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?	YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	<input checked="" type="radio"/> NO Wetland is assigned to category as determined by the ORAM. A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.

Final Category			
Choose one	Category 1	<input checked="" type="radio"/> Category 2	Category 3

End of Ohio Rapid Assessment Method for Wetlands.

Version 5.0	Ohio Rapid Assessment Method for Wetlands 10 Page Form for Wetland Categorization	
	Background Information Scoring Boundary Worksheet Narrative Rating Field Form Quantitative Rating ORAM Summary Worksheet Wetland Categorization Worksheet	Ohio EPA, Division of Surface Water Final: February 1, 2001

Instructions

The investigator is ***STRONGLY URGED*** to read the Manual for Using the Ohio Rapid Assessment Method for Wetlands for further elaboration and discussion of the questions below prior to using the rating forms.

The Narrative Rating is designed to categorize a wetland or to provide alerts to the Rater based on the presence or possible presence of threatened or endangered species. The presence or proximity of such species is often an indicator of the quality and lack of disturbance of the wetland being evaluated. In addition, it is designed to categorize certain wetlands as very low quality (Category 1) or very high quality (Category 3) regardless of the wetland's score on the Quantitative Rating. In addition, the Narrative Rating also alerts the investigator that a particular wetland *may* be a Category 3 wetland, again, regardless of the wetland's score on the Quantitative Rating.

It is ***VERY IMPORTANT*** to properly and thoroughly answer each of the questions in the ORAM in order to properly categorize a wetland. To *properly* answer all the questions, the boundaries of the wetland being assessed must be correctly identified. Refer to Scoring Boundary worksheet and the User's Manual for a discussion of how to determine the "scoring boundaries." In some instances, the scoring boundaries may differ from the "jurisdictional boundaries."

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories. The most recent version of this document is posted on Ohio EPA's Division of Surface Water web page at: <http://www.epa.ohio.gov/dsw/wetlands/WetlandEcologySection.aspx>

Background Information

Name:	Jory Van Skar / Dustin Giesler
Date:	5/19/2016
Affiliation:	Civil & Environmental Consultants, Inc.
Address:	5899 Montclair Blvd, Milford, Ohio 45150
Phone Number:	513-483-3522
e-mail address:	jvanskaik@cecinc.com / dgiesler@cecinc.com
Name of Wetland:	Wetland 3
Vegetation Community(ies):	PEM
HGM Class(es):	Rivine
Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc.	
<p>See CEC's wetland and Waterbody Report</p>	
Lat/Long or UTM Coordinate	39.090428, -84.427214
USGS Quad Name	Newport, KY-OH
County	Hamilton
Township	1N
Section and Subsection	023
Hydrologic Unit Code	05090203 - Middle Ohio-Laughery
Site Visit	5/19/2016
National Wetland Inventory Map	N/A
Ohio Wetland Inventory Map	N/A
Soil Survey	UOXCO, Urban Land - Udothents Complex, 0 to 12% Slopes, Occasionally flooded
Delineation report/map	
See CEC's Jurisdictional Waters Report	

Name of Wetland: <u>Wetland 3</u>	
Wetland Size (acres, hectares):	<u>0.05</u> acres
Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc. <u>See CEC's Jurisdictional Waters Report</u>	
Comments, Narrative Discussion, Justification of Category Changes: <u>See CEC's Jurisdictional Waters Report</u>	
Final score:	<u>17.5</u> Category: <u>1</u>

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the "scoring boundaries" of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the "jurisdictional boundaries." For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland's jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. *Areas with a high degree of hydrologic interaction should be scored as a single wetland.* In determining a wetland's scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	X	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	X	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	X	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	X	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.		X
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.		X

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), <http://www.dnr.state.oh.us/dnap>. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

#	Question	Circle one	
1	Critical Habitat. Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	<input checked="" type="radio"/> NO Go to Question 2
2	Threatened or Endangered Species. Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	<input checked="" type="radio"/> NO Go to Question 3
3	Documented High Quality Wetland. Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	<input checked="" type="radio"/> NO Go to Question 4
4	Significant Breeding or Concentration Area. Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	<input checked="" type="radio"/> NO Go to Question 5
5	Category 1 Wetlands. Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by <i>Phalaris arundinacea</i> , <i>Lythrum salicaria</i> , or <i>Phragmites australis</i> , or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	<input checked="" type="radio"/> NO Go to Question 6
6	Bogs. Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	<input checked="" type="radio"/> NO Go to Question 7
7	Fens. Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral pH (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	<input checked="" type="radio"/> NO Go to Question 8a
8a	"Old Growth Forest." Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	<input checked="" type="radio"/> NO Go to Question 8b

8b	Mature forested wetlands. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh?	YES Wetland should be evaluated for possible Category 3 status. Go to Question 9a	NO Go to Question 9a
9a	Lake Erie coastal and tributary wetlands. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?	YES Go to Question 9b	NO Go to Question 10
9b	Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 9c
9c	Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.	YES Go to Question 9d	NO Go to Question 10
9d	Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?	YES Wetland is a Category 3 wetland Go to Question 10	NO Go to Question 9e
9e	Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10.	NO Go to Question 10
10	Lake Plain Sand Prairies (Oak Openings) Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality.	YES Wetland is a Category 3 wetland. Go to Question 11	NO Go to Question 11
11	Relict Wet Prairies. Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).	YES Wetland should be evaluated for possible Category 3 status Complete Quantitative Rating	NO Complete Quantitative Rating

Table 1. Characteristic plant species.

invasive/exotic spp	fen species	bog species	oak Opening species	wet prairie species
<i>Lythrum salicaria</i>	<i>Zygadenus elegans</i> var. <i>glaucus</i>	<i>Calla palustris</i>	<i>Carex cryptolepis</i>	<i>Calamagrostis canadensis</i>
<i>Myriophyllum spicatum</i>	<i>Cacalia plantaginea</i>	<i>Carex atlantica</i> var. <i>capillacea</i>	<i>Carex lasiocarpa</i>	<i>Calamagrostis stricta</i>
<i>Najas minor</i>	<i>Carex flava</i>	<i>Carex echinata</i>	<i>Carex stricta</i>	<i>Carex altherodes</i>
<i>Phalaris arundinacea</i>	<i>Carex sterilis</i>	<i>Carex oligosperma</i>	<i>Cladium mariscoides</i>	<i>Carex buxbaumii</i>
<i>Phragmites australis</i>	<i>Carex stricta</i>	<i>Carex trisperma</i>	<i>Calamagrostis stricta</i>	<i>Carex pellita</i>
<i>Potamogeton crispus</i>	<i>Deschampsia caespitosa</i>	<i>Chamaedaphne calyculata</i>	<i>Calamagrostis canadensis</i>	<i>Carex sartwellii</i>
<i>Ranunculus ficaria</i>	<i>Eleocharis rostellata</i>	<i>Decodon verticillatus</i>	<i>Quercus palustris</i>	<i>Gentiana andrewsii</i>
<i>Rhamnus frangula</i>	<i>Eriophorum viridicarinatum</i>	<i>Eriophorum virginitum</i>		<i>Helianthus grosseserratus</i>
<i>Typha angustifolia</i>	<i>Gentianopsis</i> spp.	<i>Larix laricina</i>		<i>Liatris spicata</i>
<i>Typha x glauca</i>	<i>Lobelia kalmii</i>	<i>Nemophanthus mucronatus</i>		<i>Lysimachia quadriflora</i>
	<i>Parnassia glauca</i>	<i>Scheuchzeria palustris</i>		<i>Lythrum alatum</i>
	<i>Potentilla fruticosa</i>	<i>Sphagnum</i> spp.		<i>Pycnanthemum virginianum</i>
	<i>Rhamnus alnifolia</i>	<i>Vaccinium macrocarpon</i>		<i>Silphium terebinthinaceum</i>
	<i>Rhynchospora capillacea</i>	<i>Vaccinium corymbosum</i>		<i>Sorghastrum nutans</i>
	<i>Salix candida</i>	<i>Vaccinium oxycoccos</i>		<i>Spartina pectinata</i>
	<i>Salix myricoides</i>	<i>Woodwardia virginica</i>		<i>Solidago riddellii</i>
	<i>Salix serissima</i>	<i>Xyris difformis</i>		
	<i>Solidago ohioensis</i>			
	<i>Tofieldia glutinosa</i>			
	<i>Triglochin maritimum</i>			
	<i>Triglochin palustre</i>			

End of Narrative Rating. Begin Quantitative Rating on next page.

Site: Wetland 3 Rater(s): JAV/DMG (CEC) Date: 5/19/2006

0	0
max 5 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)

3	3
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), shrub land, 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)

7	10
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)

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)

Check all disturbances observed

- ☒ ditch
- ☐ tile
- ☐ dike
- ☐ weir
- ☒ stormwater input

- ☐ point source (nonstormwater)
- ☒ filling/grading
- ☒ road bed/RR track
- ☐ dredging
- ☐ other

3.5	13.5
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

- ☒ mowing
- ☐ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☐ woody debris removal
- ☐ toxic pollutants

- ☐ shrub/sapling removal
- ☒ herbaceous/aquatic bed removal
- ☒ sedimentation
- ☐ dredging
- ☐ farming
- ☐ nutrient enrichment

13.5
subtotal this page

Site: Wetland 3 Rater(s): JAV/DMG(CEC) Date: 5/19/2016

13.5
subtotal first page

0 13.5
max 10 pts. subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- ☐ Bog (10)
- ☐ Fen (10)
- ☐ Old growth forest (10)
- ☐ Mature forested wetland (5)
- ☐ Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- ☐ Lake Erie coastal/tributary wetland-restricted hydrology (5)
- ☐ Lake Plain Sand Prairies (Oak Openings) (10)
- ☐ Relict Wet Prairies (10)
- ☐ Known occurrence state/federal threatened or endangered species (10)
- ☐ Significant migratory songbird/water fowl habitat or usage (10)
- ☐ Category 1 Wetland. See Question 1 Qualitative Rating (-10)

4 17.5
max 20 pts. subtotal

Metric 6. Plant communities, interspersions, microtopography.

6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- ☐ Aquatic bed
- ☐ Emergent
- ☐ Shrub
- ☐ Forest
- ☐ Mudflats
- ☐ Open water
- ☐ Other

6b. horizontal (plan view) Interspersion.

Select only one.

- ☐ High (5)
- ☐ Moderately high (4)
- ☐ Moderate (3)
- ☒ Moderately low (2)
- ☒ Low (1)
- ☐ None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- ☐ Extensive >75% cover (-5)
- ☐ Moderate 25-75% cover (-3)
- ☐ Sparse 5-25% cover (-1)
- ☒ Nearly absent <5% cover (0)
- ☐ Absent (1)

6d. Microtopography.

Score all present using 0 to 3 scale.

- ☒ Vegetated hummocks/tussucks
- ☐ Coarse woody debris >15cm (6in)
- ☐ Standing dead >25cm (10in) dbh
- ☐ Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present; and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

17.5

End of Quantitative Rating. Complete Categorization Worksheets.

ORAM Summary Worksheet

Wetland 3

		circle answer or insert score	Result
Narrative Rating	Question 1. Critical Habitat	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES <input checked="" type="radio"/> NO	If yes, Category 1.
	Question 6. Bogs	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 7. Fens	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 8b. Mature Forested Wetland	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands - Unrestricted with native plants	YES <input checked="" type="radio"/> NO	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 10. Oak Openings	YES <input checked="" type="radio"/> NO	If yes, Category 3
Question 11. Relict Wet Prairies	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.	
Quantitative Rating	Metric 1. Size	0	
	Metric 2. Buffers and surrounding land use	3	
	Metric 3. Hydrology	7	
	Metric 4. Habitat	3.5	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersions, microtopography	4	
	TOTAL SCORE	17.5	Category based on score breakpoints 1

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

Choices	Circle one	Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	YES Wetland is categorized as a Category 3 wetland	<input checked="" type="radio"/> NO Is quantitative rating score <i>less</i> than the Category 2 scoring threshold (<i>excluding</i> gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9a, 11	YES Wetland should be evaluated for possible Category 3 status	<input checked="" type="radio"/> NO Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.
Did you answer "Yes" to Narrative Rating No. 5	YES Wetland is categorized as a Category 1 wetland	<input checked="" type="radio"/> NO Is quantitative rating score <i>greater</i> than the Category 2 scoring threshold (<i>including</i> any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	<input checked="" type="radio"/> YES Wetland is assigned to the appropriate category based on the scoring range	NO If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.
Does the quantitative score fall within the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?	YES Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	<input checked="" type="radio"/> NO Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc. and a consideration of the narrative criteria in OAC rule 3745-1-54(C).
Does the wetland otherwise exhibit moderate OR superior hydrologic OR habitat, OR recreational functions AND the wetland was <i>not</i> categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?	YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	<input checked="" type="radio"/> NO Wetland is assigned to category as determined by the ORAM. A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.

Final Category

Choose one	<input checked="" type="radio"/> Category 1	<input type="radio"/> Category 2	<input type="radio"/> Category 3
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End of Ohio Rapid Assessment Method for Wetlands.

Wetland 4

Version 5.0	Ohio Rapid Assessment Method for Wetlands 10 Page Form for Wetland Categorization	
	Background Information Scoring Boundary Worksheet Narrative Rating Field Form Quantitative Rating ORAM Summary Worksheet Wetland Categorization Worksheet	Ohio EPA, Division of Surface Water Final: February 1, 2001

Instructions

The investigator is *STRONGLY URGED* to read the Manual for Using the Ohio Rapid Assessment Method for Wetlands for further elaboration and discussion of the questions below prior to using the rating forms.

The Narrative Rating is designed to categorize a wetland or to provide alerts to the Rater based on the presence or possible presence of threatened or endangered species. The presence or proximity of such species is often an indicator of the quality and lack of disturbance of the wetland being evaluated. In addition, it is designed to categorize certain wetlands as very low quality (Category 1) or very high quality (Category 3) regardless of the wetland's score on the Quantitative Rating. In addition, the Narrative Rating also alerts the investigator that a particular wetland *may* be a Category 3 wetland, again, regardless of the wetland's score on the Quantitative Rating.

It is *VERY IMPORTANT* to properly and thoroughly answer each of the questions in the ORAM in order to properly categorize a wetland. To *properly* answer all the questions, the boundaries of the wetland being assessed must be correctly identified. Refer to Scoring Boundary worksheet and the User's Manual for a discussion of how to determine the "scoring boundaries." In some instances, the scoring boundaries may differ from the "jurisdictional boundaries."

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories. The most recent version of this document is posted on Ohio EPA's Division of Surface Water web page at: <http://www.epa.ohio.gov/dsw/wetlands/WetlandEcologySection.aspx>

Background Information

Name:	Joey Van Skarik / Dustin Griesler		
Date:	5/19/16		
Affiliation:	Civil & Environmental Consultants		
Address:	5899 Montclair Blvd, Milford, Ohio 45150		
Phone Number:	513 - 483-3522		
e-mail address:	jvanSkarik@cecinc.com / dgriesler@cecinc.com		
Name of Wetland:	Wetland 4		
Vegetation Community(ies):	PFO		
HGM Class(es):	Depressional		
Location of Wetland: Include map, address, north arrow, landmarks, distances, roads, etc.	See CEC's Jurisdictional Waters Report		
Lat/Long or UTM Coordinate	39.094240, -84.428124		
USGS Quad Name	Newport, KY - OH		
County	Hamilton		
Township	1N		
Section and Subsection	024		
Hydrologic Unit Code	05090203 - Middle-Ohio Laughery		
Site Visit	5/19/16		
National Wetland Inventory Map	N/A		
Ohio Wetland Inventory Map	N/A		
Soil Survey	UrUXLO - urban land - Udothents complex, 0 to 12% slopes, occasionally flooded		
Delineation report/map	See CEC's Jurisdictional Waters Report		

Name of Wetland: <u>Wetland 4</u>	
Wetland Size (acres, hectares):	<u>~2</u> acres
Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.	
<p>See CEC'S Jurisdictional Waters report</p>	
Comments, Narrative Discussion, Justification of Category Changes:	
<p>See CEC'S Jurisdictional Waters report</p>	
Final score: <u>43</u>	Category: <u>2</u>

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the "scoring boundaries" of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the "jurisdictional boundaries." For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland's jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. *Areas with a high degree of hydrologic interaction should be scored as a single wetland.* In determining a wetland's scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	X	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	X	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	X	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	X	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.		X
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.		X

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), <http://www.dnr.state.oh.us/dnap>. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

#	Question	Circle one	
1	Critical Habitat. Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	<input checked="" type="radio"/> NO Go to Question 2
2	Threatened or Endangered Species. Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	<input checked="" type="radio"/> NO Go to Question 3
3	Documented High Quality Wetland. Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	<input checked="" type="radio"/> NO Go to Question 4
4	Significant Breeding or Concentration Area. Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	<input checked="" type="radio"/> NO Go to Question 5
5	Category 1 Wetlands. Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by <i>Phalaris arundinacea</i> , <i>Lythrum salicaria</i> , or <i>Phragmites australis</i> , or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	<input checked="" type="radio"/> NO Go to Question 6
6	Bogs. Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	<input checked="" type="radio"/> NO Go to Question 7
7	Fens. Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral pH (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	<input checked="" type="radio"/> NO Go to Question 8a
8a	"Old Growth Forest." Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	<input checked="" type="radio"/> NO Go to Question 8b

8b	Mature forested wetlands. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh?	YES Wetland should be evaluated for possible Category 3 status. Go to Question 9a	<input checked="" type="radio"/> NO Go to Question 9a
9a	Lake Erie coastal and tributary wetlands. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?	YES Go to Question 9b	<input checked="" type="radio"/> NO Go to Question 10
9b	Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	<input checked="" type="radio"/> NO Go to Question 9c
9c	Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.	YES Go to Question 9d	<input checked="" type="radio"/> NO Go to Question 10
9d	Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?	YES Wetland is a Category 3 wetland Go to Question 10	<input checked="" type="radio"/> NO Go to Question 9e
9e	Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10.	<input checked="" type="radio"/> NO Go to Question 10
10	Lake Plain Sand Prairies (Oak Openings) Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality.	YES Wetland is a Category 3 wetland. Go to Question 11	<input checked="" type="radio"/> NO Go to Question 11
11	Relict Wet Prairies. Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).	YES Wetland should be evaluated for possible Category 3 status Complete Quantitative Rating	<input checked="" type="radio"/> NO Complete Quantitative Rating

Table 1. Characteristic plant species.

invasive/exotic spp	fen species	bog species	oak Opening species	wet prairie species
<i>Lythrum salicaria</i>	<i>Zygadenus elegans</i> var. <i>glaucus</i>	<i>Calla palustris</i>	<i>Carex cryptolepis</i>	<i>Calamagrostis canadensis</i>
<i>Myriophyllum spicatum</i>	<i>Cacalia plantaginea</i>	<i>Carex atlantica</i> var. <i>capillacea</i>	<i>Carex lasiocarpa</i>	<i>Calamagrostis stricta</i>
<i>Najas minor</i>	<i>Carex flava</i>	<i>Carex echinata</i>	<i>Carex stricta</i>	<i>Carex atherodes</i>
<i>Phalaris arundinacea</i>	<i>Carex sterilis</i>	<i>Carex oligosperma</i>	<i>Cladium mariscoides</i>	<i>Carex buxbaumii</i>
<i>Phragmites australis</i>	<i>Carex stricta</i>	<i>Carex trisperma</i>	<i>Calamagrostis stricta</i>	<i>Carex pellita</i>
<i>Potamogeton crispus</i>	<i>Deschampsia caespitosa</i>	<i>Chamaedaphne calyculata</i>	<i>Calamagrostis canadensis</i>	<i>Carex sartwellii</i>
<i>Ranunculus ficaria</i>	<i>Eleocharis rostellata</i>	<i>Decodon verticillatus</i>	<i>Quercus palustris</i>	<i>Gentiana andrewsii</i>
<i>Rhamnus frangula</i>	<i>Eriophorum viridicarinatum</i>	<i>Eriophorum virginicum</i>		<i>Helianthus grosseserratus</i>
<i>Typha angustifolia</i>	<i>Gentianopsis</i> spp.	<i>Larix laricina</i>		<i>Liatris spicata</i>
<i>Typha x glauca</i>	<i>Lobelia kalmii</i>	<i>Nemopanthus mucronatus</i>		<i>Lysimachia quadriflora</i>
	<i>Parnassia glauca</i>	<i>Scheuchzeria palustris</i>		<i>Lythrum alatum</i>
	<i>Potentilla fruticosa</i>	<i>Sphagnum</i> spp.		<i>Pycnanthemum virginianum</i>
	<i>Rhamnus alnifolia</i>	<i>Vaccinium macrocarpon</i>		<i>Silphium terebinthinaceum</i>
	<i>Rhynchospora capillacea</i>	<i>Vaccinium corymbosum</i>		<i>Sorghastrum nutans</i>
	<i>Salix candida</i>	<i>Vaccinium oxycoccos</i>		<i>Spartina pectinata</i>
	<i>Salix myricoides</i>	<i>Woodwardia virginica</i>		<i>Solidago riddellii</i>
	<i>Salix serotima</i>	<i>Xyris difformis</i>		
	<i>Solidago ohioensis</i>			
	<i>Tofieldia glutinosa</i>			
	<i>Triglochin maritimum</i>			
	<i>Triglochin palustre</i>			

End of Narrative Rating. Begin Quantitative Rating on next page.

Site: <u>Wetland 4</u>	Rater(s): <u>JAV/DMG (CEC)</u>	Date: <u>5/19/2016</u>
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2	2	Metric 1. Wetland Area (size).
max 6 pts.	subtotal	

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)

2	4	Metric 2. Upland buffers and surrounding land use.
max 14 pts.	subtotal	

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), shrub land, 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	18	Metric 3. Hydrology.
max 30 pts.	subtotal	

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)

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)

Check all disturbances observed

- | | |
|--|--|
| <input type="checkbox"/> ditch
<input type="checkbox"/> tile
<input type="checkbox"/> dike
<input type="checkbox"/> weir
<input type="checkbox"/> stormwater input | <input type="checkbox"/> point source (nonstormwater)
<input checked="" type="checkbox"/> filling/grading
<input checked="" type="checkbox"/> road bed/RR track
<input type="checkbox"/> dredging
<input type="checkbox"/> other |
|--|--|

12	30	Metric 4. Habitat Alteration and Development.
max 20 pts.	subtotal	

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

- | | |
|---|---|
| <input checked="" type="checkbox"/> mowing
<input type="checkbox"/> grazing
<input type="checkbox"/> clearcutting
<input checked="" type="checkbox"/> selective cutting
<input checked="" type="checkbox"/> woody debris removal
<input type="checkbox"/> toxic pollutants | <input checked="" type="checkbox"/> shrub/sapling removal
<input type="checkbox"/> herbaceous/aquatic bed removal
<input type="checkbox"/> sedimentation
<input type="checkbox"/> dredging
<input type="checkbox"/> farming
<input type="checkbox"/> nutrient enrichment |
|---|---|

30
subtotal this page

Site: Wetland 4 Rater(s): JAV/DMG (CEC) Date: 5/19/2016

30
subtotal first page

0 30
max 10 pts. subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- ☐ Bog (10)
- ☐ Fen (10)
- ☐ Old growth forest (10)
- ☐ Mature forested wetland (5)
- ☐ Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- ☐ Lake Erie coastal/tributary wetland-restricted hydrology (5)
- ☐ Lake Plain Sand Prairies (Oak Openings) (10)
- ☐ Relict Wet Prairies (10)
- ☐ Known occurrence state/federal threatened or endangered species (10)
- ☐ Significant migratory songbird/water fowl habitat or usage (10)
- ☐ Category 1 Wetland. See Question 1 Qualitative Rating (-10)

13 43
max 20 pts. subtotal

Metric 6. Plant communities, interspersions, microtopography.

6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- 0 Aquatic bed
- 0 Emergent
- 0 Shrub
- 0 Forest
- 0 Mudflats
- 0 Open water
- 0 Other

6b. horizontal (plan view) Interspersion.

Select only one.

- ☐ High (5)
- ☐ Moderately high (4)
- 3 ☒ Moderate (3)
- ☐ Moderately low (2)
- ☐ Low (1)
- ☐ None (0)

6c. Coverage of invasive plants. Refer to Table 1 GRAM long form for list. Add or deduct points for coverage

- ☐ Extensive >75% cover (-5)
- ☐ Moderate 25-75% cover (-3)
- 0 ☐ Sparse 5-25% cover (-1)
- ☒ Nearly absent <5% cover (0)
- ☐ Absent (1)

6d. Microtopography.

Score all present using 0 to 3 scale.

- 0 ☒ Vegetated hummocks/tussocks
- 2 ☐ Coarse woody debris >15cm (6in)
- 1 ☐ Standing dead >25cm (10in) dbh
- 2 ☐ Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

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End of Quantitative Rating. Complete Categorization Worksheets.

ORAM Summary Worksheet

Wetland 4

		circle answer or insert score	Result
Narrative Rating	Question 1. Critical Habitat	YES <u>NO</u>	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES <u>NO</u>	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES <u>NO</u>	If yes, Category 3.
	Question 4. Significant bird habitat	YES <u>NO</u>	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES <u>NO</u>	If yes, Category 1.
	Question 6. Bogs	YES <u>NO</u>	If yes, Category 3.
	Question 7. Fens	YES <u>NO</u>	If yes, Category 3.
	Question 8a. Old Growth Forest	YES <u>NO</u>	If yes, Category 3.
	Question 8b. Mature Forested Wetland	YES <u>NO</u>	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES <u>NO</u>	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands - Unrestricted with native plants	YES <u>NO</u>	If yes, Category 3
Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES <u>NO</u>	If yes, evaluate for Category 3; may also be 1 or 2.	
Question 10. Oak Openings	YES <u>NO</u>	If yes, Category 3	
Question 11. Relict Wet Prairies	YES <u>NO</u>	If yes, evaluate for Category 3; may also be 1 or 2.	
Quantitative Rating	Metric 1. Size	<u>2</u>	
	Metric 2. Buffers and surrounding land use	<u>2</u>	
	Metric 3. Hydrology	<u>14</u>	
	Metric 4. Habitat	<u>12</u>	
	Metric 5. Special Wetland Communities	<u>0</u>	
	Metric 6. Plant communities, interspersion, microtopography	<u>13</u>	
	TOTAL SCORE	<u>43</u>	Category based on score breakpoints <u>Modified 2</u>

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

Choices	Circle one		Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	YES Wetland is categorized as a Category 3 wetland	<input checked="" type="radio"/> NO	Is quantitative rating score <i>less</i> than the Category 2 scoring threshold (<i>excluding</i> gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	YES Wetland should be evaluated for possible Category 3 status	<input checked="" type="radio"/> NO	Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.
Did you answer "Yes" to Narrative Rating No. 5	YES Wetland is categorized as a Category 1 wetland	<input checked="" type="radio"/> NO	Is quantitative rating score <i>greater</i> than the Category 2 scoring threshold (<i>including</i> any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	<input checked="" type="radio"/> YES Wetland is assigned to the appropriate category based on the scoring range	NO	If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.
Does the quantitative score fall with the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?	YES Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	<input checked="" type="radio"/> NO	Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc. and a consideration of the narrative criteria in OAC rule 3745-1-54(C).
Does the wetland otherwise exhibit <i>moderate</i> OR <i>superior</i> hydrologic OR habitat, OR recreational functions AND the wetland was <i>not</i> categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?	YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	<input checked="" type="radio"/> NO Wetland is assigned to category as determined by the ORAM.	A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.

Final Category

Choose one	Category 1	<input checked="" type="radio"/> Category 2	Category 3
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End of Ohio Rapid Assessment Method for Wetlands.

Version 5.0	Ohio Rapid Assessment Method for Wetlands 10 Page Form for Wetland Categorization	
	Background Information Scoring Boundary Worksheet Narrative Rating Field Form Quantitative Rating ORAM Summary Worksheet Wetland Categorization Worksheet	Ohio EPA, Division of Surface Water Final: February 1, 2001

Instructions

The investigator is *STRONGLY URGED* to read the Manual for Using the Ohio Rapid Assessment Method for Wetlands for further elaboration and discussion of the questions below prior to using the rating forms.

The Narrative Rating is designed to categorize a wetland or to provide alerts to the Rater based on the presence or possible presence of threatened or endangered species. The presence or proximity of such species is often an indicator of the quality and lack of disturbance of the wetland being evaluated. In addition, it is designed to categorize certain wetlands as very low quality (Category 1) or very high quality (Category 3) regardless of the wetland's score on the Quantitative Rating. In addition, the Narrative Rating also alerts the investigator that a particular wetland *may* be a Category 3 wetland, again, regardless of the wetland's score on the Quantitative Rating.

It is *VERY IMPORTANT* to properly and thoroughly answer each of the questions in the ORAM in order to properly categorize a wetland. To *properly* answer all the questions, the boundaries of the wetland being assessed must be correctly identified. Refer to Scoring Boundary worksheet and the User's Manual for a discussion of how to determine the "scoring boundaries." In some instances, the scoring boundaries may differ from the "jurisdictional boundaries."

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories. The most recent version of this document is posted on Ohio EPA's Division of Surface Water web page at: <http://www.epa.ohio.gov/dsw/wetlands/WetlandEcologySection.aspx>

Background Information

Name: <u>Jerry Van SKuik / Dustin Griesler</u>	
Date: <u>5/19/2016</u>	
Affiliation: <u>Civil & Environmental Consultants, inc.</u>	
Address: <u>5899 Montclair BLVD, Milford, OH 45150</u>	
Phone Number: <u>513-483-3522</u>	
e-mail address: <u>jvanskauk@cecinc.com / dgriesler@cecinc.com</u>	
Name of Wetland: <u>Wetland 5</u>	
Vegetation Community(ies): <u>PFO</u>	
HGM Class(es): <u>Depressional</u>	
Location of Wetland: Include map, address, north arrow, landmarks, distances, roads, etc. <u>See cec's Jurisdictional Waters report</u>	
Lat/Long or UTM Coordinate	<u>39.106189, -84.435146</u>
USGS Quad Name	<u>Newport, KY & OH</u>
County	<u>Hamilton</u>
Township	<u>1N</u>
Section and Subsection	<u>030</u>
Hydrologic Unit Code	<u>05090203 - Middle Ohio - Laughery</u>
Site Visit	<u>05/19/16</u>
National Wetland Inventory Map	<u>N/A</u>
Ohio Wetland Inventory Map	<u>N/A</u>
Soil Survey	<u>Hu - Huntington Silt Loam, occasionally Flooded</u>
Delineation report/map	<u>See cec's Jurisdictional Waters report</u>

Name of Wetland: <u>Wetland 5</u>	
Wetland Size (acres, hectares):	<u>21.3</u> acres
Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.	
<p>See CEC's Jurisdictional Waters Report</p>	
Comments, Narrative Discussion, Justification of Category Changes:	
<p>See CEC's Jurisdictional Waters report</p>	
Final score :	<u>42.5</u> Category: <u>2</u>

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the "scoring boundaries" of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the "jurisdictional boundaries." For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland's jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. *Areas with a high degree of hydrologic interaction should be scored as a single wetland.* In determining a wetland's scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	X	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	X	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	X	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	X	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.		X
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.		X

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Narrative Rating

Wetland 5

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), <http://www.dnr.state.oh.us/dnap>. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

#	Question	Circle one	
1	Critical Habitat. Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	<input checked="" type="radio"/> NO Go to Question 2
2	Threatened or Endangered Species. Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	<input checked="" type="radio"/> NO Go to Question 3
3	Documented High Quality Wetland. Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	<input checked="" type="radio"/> NO Go to Question 4
4	Significant Breeding or Concentration Area. Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	<input checked="" type="radio"/> NO Go to Question 5
5	Category 1 Wetlands. Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by <i>Phalaris arundinacea</i> , <i>Lythrum salicaria</i> , or <i>Phragmites australis</i> , or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	<input checked="" type="radio"/> NO Go to Question 6
6	Bogs. Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	<input checked="" type="radio"/> NO Go to Question 7
7	Fens. Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral pH (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	<input checked="" type="radio"/> NO Go to Question 8a
8a	"Old Growth Forest." Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	<input checked="" type="radio"/> NO Go to Question 8b

8b	Mature forested wetlands. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh?	YES Wetland should be evaluated for possible Category 3 status. Go to Question 9a	<input checked="" type="radio"/> NO Go to Question 9a
9a	Lake Erie coastal and tributary wetlands. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?	YES Go to Question 9b	<input checked="" type="radio"/> NO Go to Question 10
9b	Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 9c
9c	Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.	YES Go to Question 9d	NO Go to Question 10
9d	Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?	YES Wetland is a Category 3 wetland Go to Question 10	NO Go to Question 9e
9e	Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10.	NO Go to Question 10
10	Lake Plain Sand Prairies (Oak Openings) Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality.	YES Wetland is a Category 3 wetland. Go to Question 11	<input checked="" type="radio"/> NO Go to Question 11
11	Relict Wet Prairies. Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).	YES Wetland should be evaluated for possible Category 3 status Complete Quantitative Rating	<input checked="" type="radio"/> NO Complete Quantitative Rating

Table 1. Characteristic plant species.

invasive/exotic spp	fen species	bog species	Oak Opening species	wet prairie species
<i>Lythrum salicaria</i>	<i>Zygadenus elegans</i> var. <i>glaucus</i>	<i>Calla palustris</i>	<i>Carex cryptolepis</i>	<i>Calamagrostis canadensis</i>
<i>Myriophyllum spicatum</i>	<i>Cacalia plantaginea</i>	<i>Carex atlantica</i> var. <i>capillacea</i>	<i>Carex lasiocarpa</i>	<i>Calamagrostis stricta</i>
<i>Najas minor</i>	<i>Carex flava</i>	<i>Carex echinata</i>	<i>Carex stricta</i>	<i>Carex altherodes</i>
<i>Phalaris arundinacea</i>	<i>Carex sterilis</i>	<i>Carex oligosperma</i>	<i>Cladium mariscoides</i>	<i>Carex buxbaumii</i>
<i>Phragmites australis</i>	<i>Carex stricta</i>	<i>Carex trisperma</i>	<i>Calamagrostis stricta</i>	<i>Carex pellita</i>
<i>Potamogeton crispus</i>	<i>Deschampsia caespitosa</i>	<i>Chamaedaphne calyculata</i>	<i>Calamagrostis canadensis</i>	<i>Carex sartwellii</i>
<i>Ranunculus ficaria</i>	<i>Eleocharis rostellata</i>	<i>Decodon verticillatus</i>	<i>Quercus palustris</i>	<i>Gentiana andrewsii</i>
<i>Rhamnus frangula</i>	<i>Eriophorum viridicarinatum</i>	<i>Eriophorum virginicum</i>		<i>Helianthus grosseserratus</i>
<i>Typha angustifolia</i>	<i>Gentianopsis</i> spp.	<i>Larix laricina</i>		<i>Liatris spicata</i>
<i>Typha xglauca</i>	<i>Lobelia kalmii</i>	<i>Nemopanthus mucronatus</i>		<i>Lysimachia quadriflora</i>
	<i>Parnassia glauca</i>	<i>Scheuchzeria palustris</i>		<i>Lythrum alatum</i>
	<i>Potentilla fruticosa</i>	<i>Sphagnum</i> spp.		<i>Pycnanthemum virginianum</i>
	<i>Rhamnus alnifolia</i>	<i>Vaccinium macrocarpon</i>		<i>Silphium terebinthinaceum</i>
	<i>Rhynchospora capillacea</i>	<i>Vaccinium corymbosum</i>		<i>Sorghastrum nutans</i>
	<i>Salix candida</i>	<i>Vaccinium oxycoccos</i>		<i>Spartina pectinata</i>
	<i>Salix myricoides</i>	<i>Woodwardia virginica</i>		<i>Solidago rigida</i>
	<i>Salix serissima</i>	<i>Xyris difformis</i>		
	<i>Solidago ohioensis</i>			
	<i>Tofieldia glutinosa</i>			
	<i>Triglochin maritimum</i>			
	<i>Triglochin palustre</i>			

End of Narrative Rating. Begin Quantitative Rating on next page.

Site: Wetland 5	Rater(s): JAV/DMG (CEC)	Date: 5/19/16
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2	2	Metric 1. Wetland Area (size).
max 6 pts	subtotal	

Select one size class and assign score.

- 2
- ☐ >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)

2	4	Metric 2. Upland buffers and surrounding land use.
max 14 pts.	subtotal	

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

- 0
- ☐ 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.

- 2
- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
 - ☐ LOW. Old field (>10 years), shrub land, 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)

13.5	17.5	Metric 3. Hydrology.
max 30 pts.	subtotal	

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

- 1
- ☐ High pH groundwater (5)
 - ☐ Other groundwater (3)
 - ☒ Precipitation (1)
 - ☐ Seasonal/intermittent surface water (3)
 - ☐ Perennial surface water (lake or stream) (5)
- 2
- 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.

- 5
- ☐ None or none apparent (12)
 - ☒ Recovered (7)
 - ☒ Recovering (3)
 - ☐ Recent or no recovery (1)

3b. Connectivity. Score all that apply.

- 2
- ☒ 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.

- 3.5
- ☒ Semi- to permanently inundated/saturated (4)
 - ☒ Regularly inundated/saturated (3)
 - ☐ Seasonally inundated (2)
 - ☐ Seasonally saturated in upper 30cm (12in) (1)

Check all disturbances observed

- ☒ ditch
- ☐ tile
- ☐ dike
- ☐ weir
- ☒ stormwater input

- ☐ point source (nonstormwater)
- ☒ filling/grading
- ☒ road bed/RR track
- ☐ dredging
- ☐ other

102	29.5	Metric 4. Habitat Alteration and Development.
max 20 pts.	subtotal	

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

- 3.5
- ☒ None or none apparent (4)
 - ☒ Recovered (3)
 - ☐ Recovering (2)
 - ☐ Recent or no recovery (1)

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

- 4
- ☐ 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.

- 4.5
- ☐ None or none apparent (9)
 - ☒ Recovered (6)
 - ☒ Recovering (3)
 - ☐ Recent or no recovery (1)

Check all disturbances observed

- ☒ mowing
- ☐ grazing
- ☐ clearcutting
- ☒ selective cutting
- ☒ woody debris removal
- ☐ toxic pollutants

- ☒ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ sedimentation
- ☐ dredging
- ☐ farming
- ☐ nutrient enrichment

29.5
subtotal this page

Site: Wetland 5 Rater(s): JAV/DMG (CEC) Date: 5/19/16

29.5
subtotal first page

0 29.5 Metric 5. Special Wetlands.
max 10 pts. subtotal

Check all that apply and score as indicated.

- ☐ Bog (10)
- ☐ Fen (10)
- ☐ Old growth forest (10)
- ☐ Mature forested wetland (5)
- ☒ Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- ☐ Lake Erie coastal/tributary wetland-restricted hydrology (5)
- ☐ Lake Plain Sand Prairies (Oak Openings) (10)
- ☐ Relict Wet Prairies (10)
- ☐ Known occurrence state/federal threatened or endangered species (10)
- ☐ Significant migratory songbird/water fowl habitat or usage (10)
- ☐ Category 1 Wetland. See Question 1 Qualitative Rating (-10)

13 42.5 Metric 6. Plant communities, interspersions, microtopography.
max 20 pts. subtotal

6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- ☐ 0 Aquatic bed
- ☐ 1 Emergent
- ☐ 2 Shrub
- ☐ 3 Forest
- ☐ 0 Mudflats
- ☐ 1 Open water
- ☐ Other

6b. Horizontal (plan view) Interspersion.

Select only one.

- ☐ High (5)
- ☐ Moderately high (4)
- ☒ Moderate (3)
- ☐ Moderately low (2)
- ☐ Low (1)
- ☐ None (0)

6c. Coverage of invasive plants. Refer to Table 1 GRAM long form for list. Add or deduct points for coverage

- ☐ Extensive >75% cover (-5)
- ☐ Moderate 25-75% cover (-3)
- ☐ Sparse 5-25% cover (-1)
- ☒ Nearly absent <5% cover (0)
- ☐ Absent (1)

6d. Microtopography.

Score all present using 0 to 3 scale.

- ☐ 0 Vegetated hummocks/tussocks
- ☒ 2 Coarse woody debris >15cm (6in)
- ☐ 1 Standing dead >25cm (10in) dbh
- ☒ 2 Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

42.5

End of Quantitative Rating. Complete Categorization Worksheets.

ORAM Summary Worksheet

Wetland 5

		circle answer or insert score	Result
Narrative Rating	Question 1. Critical Habitat	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES <input checked="" type="radio"/> NO	If yes, Category 1.
	Question 6. Bogs	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 7. Fens	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 8b. Mature Forested Wetland	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands - Unrestricted with native plants	YES <input checked="" type="radio"/> NO	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 10. Oak Openings	YES <input checked="" type="radio"/> NO	If yes, Category 3
Question 11. Relict Wet Prairies	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.	
Quantitative Rating	Metric 1. Size	2	
	Metric 2. Buffers and surrounding land use	2	
	Metric 3. Hydrology	13.5	
	Metric 4. Habitat	12	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersed, microtopography	13	
	TOTAL SCORE	42.5	Category based on score breakpoints Modified 2

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

Choices	Circle one	Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	YES Wetland is categorized as a Category 3 wetland	<input checked="" type="radio"/> NO Is quantitative rating score <i>less</i> than the Category 2 scoring threshold (<i>excluding</i> gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	YES Wetland should be evaluated for possible Category 3 status	<input checked="" type="radio"/> NO Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.
Did you answer "Yes" to Narrative Rating No. 5	YES Wetland is categorized as a Category 1 wetland	<input checked="" type="radio"/> NO Is quantitative rating score <i>greater</i> than the Category 2 scoring threshold (<i>including</i> any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	<input checked="" type="radio"/> YES Wetland is assigned to the appropriate category based on the scoring range	<input checked="" type="radio"/> NO If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.
Does the quantitative score fall with the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?	YES Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	<input checked="" type="radio"/> NO Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc. and a consideration of the narrative criteria in OAC rule 3745-1-54(C).
Does the wetland otherwise exhibit <i>moderate</i> OR <i>superior</i> hydrologic OR habitat, OR recreational functions AND the wetland was <i>not</i> categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?	YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	<input checked="" type="radio"/> NO Wetland is assigned to category as determined by the ORAM. A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.

Final Category

Choose one	Category 1	<input checked="" type="radio"/> Category 2	Category 3
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End of Ohio Rapid Assessment Method for Wetlands.

Version 5.0	Ohio Rapid Assessment Method for Wetlands 10 Page Form for Wetland Categorization	
	Background Information Scoring Boundary Worksheet Narrative Rating Field Form Quantitative Rating ORAM Summary Worksheet Wetland Categorization Worksheet	Ohio EPA, Division of Surface Water Final: February 1, 2001

Instructions

The investigator is *STRONGLY URGED* to read the Manual for Using the Ohio Rapid Assessment Method for Wetlands for further elaboration and discussion of the questions below prior to using the rating forms.

The Narrative Rating is designed to categorize a wetland or to provide alerts to the Rater based on the presence or possible presence of threatened or endangered species. The presence or proximity of such species is often an indicator of the quality and lack of disturbance of the wetland being evaluated. In addition, it is designed to categorize certain wetlands as very low quality (Category 1) or very high quality (Category 3) regardless of the wetland's score on the Quantitative Rating. In addition, the Narrative Rating also alerts the investigator that a particular wetland *may* be a Category 3 wetland, again, regardless of the wetland's score on the Quantitative Rating.

It is *VERY IMPORTANT* to properly and thoroughly answer each of the questions in the ORAM in order to properly categorize a wetland. To *properly* answer all the questions, the boundaries of the wetland being assessed must be correctly identified. Refer to Scoring Boundary worksheet and the User's Manual for a discussion of how to determine the "scoring boundaries." In some instances, the scoring boundaries may differ from the "jurisdictional boundaries."

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories. The most recent version of this document is posted on Ohio EPA's Division of Surface Water web page at: <http://www.epa.ohio.gov/dsw/wetlands/WetlandEcologySection.aspx>

Background Information

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e-mail address: <u>jvanschaik@cecinc.com / dgriesler@cecinc.com</u>	
Name of Wetland: <u>Wetland 6</u>	
Vegetation Community(ies): <u>PEM</u>	
HGM Class(es): <u>Depressional</u>	
Location of Wetland: Include map, address, north arrow, landmarks, distances, roads, etc. <u>See CEC's Jurisdictional Waters report</u>	
Lat/Long or UTM Coordinate	<u>39.112298, -84.439813</u>
USGS Quad Name	<u>Newport, KY-OH</u>
County	<u>Hamilton</u>
Township	<u>2N</u>
Section and Subsection	<u>025 sub</u>
Hydrologic Unit Code	<u>05090203 - Middle Ohio-Laughery</u>
Site Visit	<u>5/19/16</u>
National Wetland Inventory Map	<u>N/A</u>
Ohio Wetland Inventory Map	<u>N/A</u>
Soil Survey	<u>Uc UXLO - urban land - Udothents complex, 0 to 12% slopes, occasionally flooded</u>
Delineation report/map	<u>See CEC's Jurisdictional Waters report</u>

Name of Wetland: <u>Wetland 6</u>	
Wetland Size (acres, hectares):	<u>~0.6</u> <u>acres</u>
Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc. <u>See CEC's Jurisdictional Waters Report</u>	
Comments, Narrative Discussion, Justification of Category Changes: <u>See CEC's Jurisdictional Waters Report</u>	
Final score :	Category: <u>1</u>

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the "scoring boundaries" of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the "jurisdictional boundaries." For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland's jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. *Areas with a high degree of hydrologic interaction should be scored as a single wetland.* In determining a wetland's scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	X	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	X	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	X	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	X	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.		X
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.		X

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Narrative Rating

Wetland 6

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), <http://www.dnr.state.oh.us/dnap>. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

#	Question	Circle one	
1	Critical Habitat. Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	<input checked="" type="radio"/> NO Go to Question 2
2	Threatened or Endangered Species. Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	<input checked="" type="radio"/> NO Go to Question 3
3	Documented High Quality Wetland. Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	<input checked="" type="radio"/> NO Go to Question 4
4	Significant Breeding or Concentration Area. Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	<input checked="" type="radio"/> NO Go to Question 5
5	Category 1 Wetlands. Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by <i>Phalaris arundinacea</i> , <i>Lythrum salicaria</i> , or <i>Phragmites australis</i> , or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	<input checked="" type="radio"/> NO Go to Question 6
6	Bogs. Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	<input checked="" type="radio"/> NO Go to Question 7
7	Fens. Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral pH (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	<input checked="" type="radio"/> NO Go to Question 8a
8a	"Old Growth Forest." Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	<input checked="" type="radio"/> NO Go to Question 8b

8b	Mature forested wetlands. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh?	YES Wetland should be evaluated for possible Category 3 status. Go to Question 9a	NO Go to Question 9a
9a	Lake Erie coastal and tributary wetlands. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?	YES Go to Question 9b	NO Go to Question 10
9b	Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 9c
9c	Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.	YES Go to Question 9d	NO Go to Question 10
9d	Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?	YES Wetland is a Category 3 wetland Go to Question 10	NO Go to Question 9e
9e	Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10.	NO Go to Question 10
10	Lake Plain Sand Prairies (Oak Openings) Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality.	YES Wetland is a Category 3 wetland. Go to Question 11	NO Go to Question 11
11	Relict Wet Prairies. Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).	YES Wetland should be evaluated for possible Category 3 status Complete Quantitative Rating	NO Complete Quantitative Rating

Table 1. Characteristic plant species.

invasive/exotic spp	fen species	bog species	Oak Opening species	wet prairie species
<i>Lythrum salicaria</i>	<i>Zygadenus elegans</i> var. <i>glaucus</i>	<i>Calla palustris</i>	<i>Carex cryptolepis</i>	<i>Calamagrostis canadensis</i>
<i>Myriophyllum spicatum</i>	<i>Cacalia plantaginea</i>	<i>Carex atlantica</i> var. <i>capillacea</i>	<i>Carex lasiocarpa</i>	<i>Calamagrostis stricta</i>
<i>Najas minor</i>	<i>Carex flava</i>	<i>Carex echinata</i>	<i>Carex stricta</i>	<i>Carex atherodes</i>
<i>Phalaris arundinacea</i>	<i>Carex sterilis</i>	<i>Carex oligosperma</i>	<i>Cladium mariscoides</i>	<i>Carex buxbaumii</i>
<i>Phragmites australis</i>	<i>Carex stricta</i>	<i>Carex trisperma</i>	<i>Calamagrostis stricta</i>	<i>Carex pellita</i>
<i>Potamogeton crispus</i>	<i>Deschampsia caespitosa</i>	<i>Chamaedaphne calyculata</i>	<i>Calamagrostis canadensis</i>	<i>Carex sartwellii</i>
<i>Ranunculus ficaria</i>	<i>Eleocharis rostellata</i>	<i>Decodon verticillatus</i>	<i>Quercus palustris</i>	<i>Gentiana andrewsii</i>
<i>Rhamnus frangula</i>	<i>Eriophorum viridicarinatum</i>	<i>Eriophorum virginicum</i>		<i>Helianthus grosseserratus</i>
<i>Typha angustifolia</i>	<i>Gentianopsis</i> spp.	<i>Larix laricina</i>		<i>Liatris spicata</i>
<i>Typha xglauca</i>	<i>Lobelia kalmii</i>	<i>Nemopanthes mucronatus</i>		<i>Lysimachia quadriflora</i>
	<i>Parnassia glauca</i>	<i>Scheuchzeria palustris</i>		<i>Lythrum alatum</i>
	<i>Potentilla fruticosa</i>	<i>Sphagnum</i> spp.		<i>Pycnanthemum virginianum</i>
	<i>Rhamnus alnifolia</i>	<i>Vaccinium macrocarpon</i>		<i>Silphium terebinthinaceum</i>
	<i>Rhynchospora capillacea</i>	<i>Vaccinium corymbosum</i>		<i>Sorghastrum nutans</i>
	<i>Salix candida</i>	<i>Vaccinium oxycoccos</i>		<i>Spartina pectinata</i>
	<i>Salix myricoides</i>	<i>Woodwardia virginica</i>		<i>Solidago riddellii</i>
	<i>Salix serotima</i>	<i>Xyris difformis</i>		
	<i>Solidago ohioensis</i>			
	<i>Tofieldia glutinosa</i>			
	<i>Triglochin maritimum</i>			
	<i>Triglochin palustre</i>			

End of Narrative Rating. Begin Quantitative Rating on next page.

Site: Wetland 6	Rater(s): JAV/DMG (CEC)	Date: 5/19/16
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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)

1	3
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), shrub land, 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)

7.5	10.5
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)

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)

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)

Check all disturbances observed	
<input type="checkbox"/> ditch <input type="checkbox"/> tile <input type="checkbox"/> dike <input type="checkbox"/> weir <input type="checkbox"/> stormwater input	<input type="checkbox"/> point source (nonstormwater) <input type="checkbox"/> filling/grading <input type="checkbox"/> road bed/RR track <input type="checkbox"/> dredging <input type="checkbox"/> other

5.5	16
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	
<input checked="" 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	<input type="checkbox"/> shrub/sapling removal <input type="checkbox"/> herbaceous/aquatic bed removal <input checked="" type="checkbox"/> sedimentation <input type="checkbox"/> dredging <input type="checkbox"/> farming <input type="checkbox"/> nutrient enrichment

16
subtotal this page

Site: Wetland 6 Rater(s): JAN / DMG (CEC) Date: 5/19/16

16
subtotal first page

0 16
max 10 pts. subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

Ø

- ☐ Bog (10)
- ☐ Fen (10)
- ☐ Old growth forest (10)
- ☐ Mature forested wetland (5)
- ☐ Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- ☐ Lake Erie coastal/tributary wetland-restricted hydrology (5)
- ☐ Lake Plain Sand Prairies (Oak Openings) (10)
- ☐ Relict Wet Prairies (10)
- ☐ Known occurrence state/federal threatened or endangered species (10)
- ☐ Significant migratory songbird/water fowl habitat or usage (10)
- ☐ Category 1 Wetland. See Question 1 Qualitative Rating (-10)

2 18
max 20 pts. subtotal

Metric 6. Plant communities, interspersions, microtopography.

6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

2

- ☐ Aquatic bed
- ☒ Emergent
- ☐ Shrub
- ☐ Forest
- ☐ Mudflats
- ☐ Open water
- ☐ Other

6b. horizontal (plan view) Interspersion.

Select only one.

Ø

- ☐ High (5)
- ☐ Moderately high (4)
- ☐ Moderate (3)
- ☐ Moderately low (2)
- ☐ Low (1)
- ☒ None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

Ø

- ☐ Extensive >75% cover (-5)
- ☐ Moderate 25-75% cover (-3)
- ☐ Sparse 5-25% cover (-1)
- ☒ Nearly absent <5% cover (0)
- ☐ Absent (1)

6d. Microtopography.

Score all present using 0 to 3 scale.

Ø

- ☐ Vegetated hummocks/tussocks
- ☐ Coarse woody debris >15cm (6in)
- ☐ Standing dead >25cm (10in) dbh
- ☐ Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

18

End of Quantitative Rating. Complete Categorization Worksheets.

ORAM Summary Worksheet

Wetland 6

		circle answer or insert score	Result
Narrative Rating	Question 1. Critical Habitat	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES <input checked="" type="radio"/> NO	If yes, Category 1.
	Question 6. Bogs	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 7. Fens	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES <input checked="" type="radio"/> NO	If yes, Category 3.
	Question 8b. Mature Forested Wetland	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands - Unrestricted with native plants	YES <input checked="" type="radio"/> NO	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 10. Oak Openings	YES <input checked="" type="radio"/> NO	If yes, Category 3
Question 11. Relict Wet Prairies	YES <input checked="" type="radio"/> NO	If yes, evaluate for Category 3; may also be 1 or 2.	
Quantitative Rating	Metric 1. Size	2	
	Metric 2. Buffers and surrounding land use	1	
	Metric 3. Hydrology	7.5	
	Metric 4. Habitat	5.5	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersion, microtopography	2	
	TOTAL SCORE	18	Category based on score breakpoints 1

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

Choices	Circle one	Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	YES Wetland is categorized as a Category 3 wetland	<input checked="" type="radio"/> NO Is quantitative rating score <i>less</i> than the Category 2 scoring threshold (<i>excluding</i> gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	YES Wetland should be evaluated for possible Category 3 status	<input checked="" type="radio"/> NO Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.
Did you answer "Yes" to Narrative Rating No. 5	YES Wetland is categorized as a Category 1 wetland	<input checked="" type="radio"/> NO Is quantitative rating score <i>greater</i> than the Category 2 scoring threshold (<i>including</i> any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	<input checked="" type="radio"/> YES Wetland is assigned to the appropriate category based on the scoring range	<input type="radio"/> NO If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.
Does the quantitative score fall within the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?	YES Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	<input checked="" type="radio"/> NO Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc. and a consideration of the narrative criteria in OAC rule 3745-1-54(C).
Does the wetland otherwise exhibit <i>moderate OR superior</i> hydrologic OR habitat, OR recreational functions AND the wetland was <i>not</i> categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?	YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	<input checked="" type="radio"/> NO Wetland is assigned to category as determined by the ORAM. A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.

Final Category

Choose one	<input checked="" type="radio"/> Category 1	<input type="radio"/> Category 2	<input type="radio"/> Category 3
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End of Ohio Rapid Assessment Method for Wetlands.

ATTACHMENT 6

PRELIMINARY JURISDICTIONAL DETERMINATION

ATTACHMENT

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR PRELIMINARY JURISDICTIONAL DETERMINATION (JD): October 7, 2016

B. NAME AND ADDRESS OF PERSON REQUESTING PRELIMINARY JD:

Mr. Joseph Van Skaik
Civil & Environmental Consultants, Inc.
5899 Montclair Boulevard
Cincinnati, Ohio 45150

C. DISTRICT OFFICE, FILE NAME, AND NUMBER:

LRH-2016-00863-OHR
Duke Energy – Line D0008 Pipeline Replacement Project

D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION:

State: Ohio County/parish/borough: Hamilton City: Cincinnati

Center coordinates of site: Latitude: 37.52464° N, Longitude: 81.88416° W

Name of nearest waterbody: Davis Run; see Table 1.

Identify (estimate) amount of waters in the review area:

Non-wetland waters: 0 linear feet (lf) total

Wetlands: 0 acre (ac) total

Cowardin: Palustrine

Classification 0.77 ac = emergent wetlands (PEM)

2.50 ac = forested wetlands (PFO)

Name of any water bodies on the site that have been identified as Section 10 waters:

None.

E. REVIEW PERFORMED FOR SITE EVALUATION:

☒ Office (Desk) Determination. Date: October 7, 2016

☐ Field Determination. Date(s):

1. The Corps of Engineers believes that there may be jurisdictional waters of the United States on the subject site, and the permit applicant or other affected party who requested this preliminary JD is hereby advised of his or her option to request and obtain an approved jurisdictional determination (JD) for that site. Nevertheless, the permit applicant or other person who requested this preliminary JD has declined to exercise the option to obtain an approved JD in this instance and at this time.

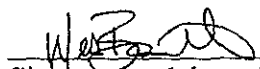
2. In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre-construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an approved JD for the activity, the permit applicant is hereby made aware of the following: (1) the permit applicant has elected to seek a permit authorization based on a preliminary JD, which does not make an official determination of jurisdictional waters; (2) that the applicant has the option to request an approved JD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an approved JD could possibly result in less compensatory mitigation being required or different special conditions; (3) that the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) that the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) that undertaking any activity in reliance upon the subject permit authorization without requesting an approved JD constitutes the applicant's acceptance of the use of the preliminary JD, but that either form of JD will be processed as soon as is practicable; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a preliminary JD constitutes agreement that all wetlands and other water bodies on the site affected in any way by that activity are jurisdictional waters of the United States, and precludes any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an approved JD or a preliminary JD, that JD will be processed as soon as is practicable. Further, an approved JD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 C.F.R. 331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable.

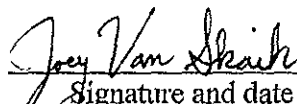
This preliminary JD finds that there "*may be*" waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

SUPPORTING DATA. Data reviewed for preliminary JD:

- ☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: *Wetland and Waterbody Delineation Report; Line D0008 Pipeline Replacement Project; Cincinnati, Hamilton County, Ohio; CEC Project 153-230, dated August 25, 2016.*
- ☒ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
 - ☒ Office concurs with data sheets/delineation report. For the streams and wetlands listed in Table 1.
 - ☐ Office does not concur with data sheets/delineation report.
- ☐ Data sheets prepared by the Corps:
- ☐ Corps navigable waters' study:
- ☒ U.S. Geological Survey Hydrologic Atlas:
 - ☒ USGS NHD data. USACE ORM NHD Dataset.
 - ☐ USGS 8 and 12 digit HUC maps.
- ☒ U.S. Geological Survey map(s). USGS KY – NEWPORT 1:24K Quad.
- ☐ USDA Natural Resources Conservation Service Soil Survey.
- ☒ National wetlands inventory map(s). USACE ORM NWI dataset
- ☐ State/Local wetland inventory map(s):
- ☐ FEMA/FIRM maps:
- ☐ 100-year Floodplain Elevation (National Geodetic Vertical Datum of 1929):
- ☒ Photographs: ☒ Aerial: Google Earth Pro.
or ☐ Other: in the report referenced above.
- ☐ Previous determination(s). File no. and date of response letter:
- ☐ Other information (please specify):

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

 7 OCT 2016
Signature and date of
Regulatory Project Manager
(REQUIRED)

 10/11/2016
Signature and date of
person requesting preliminary JD
(REQUIRED, unless obtaining the
signature is impracticable)

**Table 1 – On-site Aquatic Resources associated with
Duke Energy – Line D0008 Pipeline Replacement Project
LRH-2016-00863-OHR**

Aquatic Resource ID	Local Waterway	Latitude (°N)	Longitude (°W)	Flow Regime / Cowardin Class	Linear Feet (ft) of Stream within the PJD Boundary	Acre (ac) of Wetland within the PJD Boundary	Class of Aquatic Resource
Wetland 1	---	39.079502	84.427626	PEM	---	0.06	Non-section 10 Wetland
		39.081675	84.427267	PFO	---	1.74	
Wetland 2	---	39.082954	84.427681	PFO	---	0.07	Non-section 10 Wetland
		39.083304	84.427484	PEM	---	0.58	
Wetland 3	---	39.090416	84.427253	PEM	---	0.04	Non-section 10 Wetland
Wetland 4	---	39.094268	84.428177	PFO	---	0.42	Non-section 10 Wetland
Wetland 5	---	39.106047	84.435074	PFO	---	0.27	Non-section 10 Wetland
Wetland 6	---	39.112351	84.439812	PEM	---	0.09	Non-section 10 Wetland
Total						0	

ATTACHMENT 7

**AGENCY COORDINATION LETTER AND THREATENED AND
ENDANGERED SPECIES HABITAT ASSESSMENT REPORT**



October 24, 2016

Mr. Dan Everson, Field Office Supervisor
U.S. Fish & Wildlife Service
Ohio Ecological Services Field Office
4625 Morse Road, Suite 104
Columbus, Ohio 43230

Dear Mr. Everson:

Subject: Agency Coordination Letter and
Threatened and Endangered Species Habitat Assessment
Line D000B Pipeline Replacement Project
Cincinnati, Hamilton County, Ohio
CEC Project 153-230

On behalf of Duke Energy Corporation (Duke Energy), Civil & Environmental Consultants, Inc. (CEC) has prepared the following letter report documenting the results of our federally-listed threatened and endangered species habitat assessment within the Line D000B Pipeline Replacement Project study corridor (the Project area) located in Cincinnati's East End, Hamilton County, Ohio. The variable Project study corridor width, averaging 200-foot wide, is approximately 3.45 miles in length and totals approximately 84.2 acres. In an effort to allow maximum project flexibility with respect to avoiding environmental constraints, the Project area extends beyond the proposed pipeline easement and associated workspace by design.

1.0 PROJECT DESCRIPTION

Duke Energy proposes to replace approximately 18,200 feet (3.45 miles) of existing single 20- and 24-inch spiral welded, coated steel, natural gas pipeline originally installed in 1948 with new 20- and 24-inch diameter, corrosion protected steel pipe. The pipeline easement is at maximum 50 feet in width, with up to another 20 to 50 feet of additional temporary workspace where required and available. Approximately 2.47 miles or 13,303 feet of the replacement pipeline is proposed to be collocated within the existing pipeline right-of-way (ROW), while the remaining 0.73 mile (3,857 feet) of replacement pipeline will be located within existing roadway

easement or new pipeline ROW. The north-western terminus of the Project begins southeast of Duke Energy Ohio's natural gas distribution center on the Cincinnati's East End Facility property. The pipeline will run in a south-southeast direction and will be bound by U.S. 52 to the east and the Ohio River to the southwest. The replacement pipeline will terminate near the confluences of the Little Miami and Ohio Rivers (Figure 1). Duke Energy is in the process of acquiring authorization from the Ohio Power Siting Board (OPSB). The project is authorized by the U.S. Army Corps of Engineers (USACE), pursuant to Nationwide Permit (NWP) 12 (Utility Line Activities). A Pre-Construction Notification to the USACE is not required for the Project as temporary impacts to waters of the U.S. are less than 0.1 acre and the project meets the NWP 12 specific regional conditions and Ohio State Certification Special Limitations and Conditions. The professional opinions expressed in this letter report were developed based upon observations made within the Project area on May 16, 18, and 19, 2016, and available information.

2.0 BACKGROUND

CEC was retained by Duke Energy to review available information and conduct an endangered and threatened species habitat assessment within the Project area. Prior to conducting the site visits, CEC reviewed the County Distribution List of Federally-Listed Threatened, Endangered, Proposed, and Candidate Species (USFWS 2016) on the U.S. Fish & Wildlife Service (USFWS) Midwest Ecological Services Regional Field Office website to determine which federally-listed endangered, federally-listed threatened, proposed endangered, proposed threatened, and candidate species are known to occur, or potentially occur, in Hamilton County (Attachment B).

In addition to reviewing the USFWS's Species Distribution List for Hamilton County, the Ohio Department of Natural Resources (ODNR) Division of Wildlife's County Distribution List of State Listed Wildlife Species was consulted for Federally-listed endangered or threatened species as occurring, or potentially occurring, in Hamilton County (Attachment C). This review also included an identification of state-listed plants that are also on the federal list of endangered and threatened species (Attachment D).

3.0 SITE OBSERVATIONS AND RESULTS OF DOCUMENT REVIEW

According to the USFWS's County Distribution List of Federally-Listed Threatened, Endangered, Proposed, and Candidate Species for Hamilton County, Ohio, the following species were identified as occurring, or potentially occurring in the Project area: the Indiana bat (*Myotis sodalis*, endangered), northern long-eared bat (*Myotis septentrionalis*, threatened), fanshell mussel (*Cyprogenia stegaria* (= *C. irrorata*), endangered), pink mucket pearlymussel (*Lampsilis abrupta*, endangered), rayed bean mussel (*Villosa fabalis*, endangered), sheepnose mussel (*Plethobasus cyphus*, endangered), snuffbox mussel (*Epioblasma triquetra*, endangered), and the running buffalo clover (*Trifolium stoloniferum*, endangered).

The ODNR (2016) lists the following federally-listed endangered or threatened species as occurring, or potentially occurring, in Hamilton County: the Indiana bat, northern long-eared bat, the running buffalo clover, as well as the five mussel species that were noted by the USFWS. The ODNR also identified purple cat's paw mussel (*Epioblasma obliquata*, endangered), northern riffleshell mussel (*Epioblasma torulosa rangiana*, endangered), clubshell mussel (*Pleurobema clava*, endangered), and the rabbitsfoot mussel (*Quadrula cylindrica*, threatened).

The Project area was evaluated by a team of two CEC biologists on May 16, 18, and 19, 2016, to document existing vegetation communities and hydrologic conditions. Each type of habitat present within the Project area was qualitatively evaluated for its potential to be suitable habitat for the Indiana bat, northern long-eared bat, running buffalo clover, and the aforementioned mussel species. Attachment A contains representative photographs of each habitat type found during the site visits and Figures 3 through 18 shows the approximate location of each photograph taken during the site visit.

The plant communities present within the Project area consists of manicured lawn habitat, mowed park habitat, existing ROW/early successional habitat, mixed early successional/second growth forest, mature floodplain forest, and wetland (Figures 3 through 18).

Mowed park habitat within the Project area is generally located between the northern terminus of the Project and Congress Avenue, and in the vicinity of Stites Road. This habitat type was observed at Schmidt Sports Complex, Turkey Ridge Recreational Area, along the Ohio River Trail, and at the Kellogg Avenue Park. Common plant species located within the mowed park

habitat includes oak trees (*Quercus* spp.), maple trees (*Acer* spp.), white clover (*Trifolium repens*), red clover (*Trifolium pratense*), common dandelion (*Taraxacum officinale*), bluegrass (*Poa* sp.), tall fescue (*Schedonorus arundinaceus*), and plantains (*Plantago* spp.). Representative photographs of this habitat type are included in Attachment A. The locations of the mowed park habitat present within the Project area and the location and direction where each photograph was taken are shown on Figures 3 through 18.

Existing ROW/early successional habitat within the Project area is generally located along the existing, bermed ROW near the southeastern extent of the Project. Common plant species located within this habitat type includes white clover, red clover, giant ironweed (*Vernonia gigantea*), stickywilly (*Galium aparine*), creeping jenny (*Lysimachia nummularia*), poison ivy (*Toxicodendron radicans*), hog peanut (*Amphicarpaea bracteata*), great ragweed (*Ambrosia trifida*), common ragweed (*Ambrosia artemisiifolia*), wingstem (*Verbesina alternifolia*), Canada goldenrod (*Solidago altissima*), eastern daisy fleabane (*Erigeron annuus*), Indianhemp (*Apocynum cannabinum*), Japanese honeysuckle (*Lonicera japonica*), and Amur honeysuckle (*Lonicera maackii*), box elder (*Acer negundo*), and silver maple (*Acer saccharinum*). Representative photographs of this habitat type are included in Attachment A. The locations of the existing ROW/early successional habitat present within the Project area and the location and direction where each photograph was taken are shown on Figures 3 through 18.

Mixed early successional/second growth forest habitat within the Project area is generally located along the Ohio River Trail, Kellogg Avenue, and Anchorage Road. The overstory vegetation was dominated by box elder, black locust (*Robinia pseudoacacia*), red mulberry (*Morus rubra*), hackberry (*Celtis occidentalis*), and maple trees. Dominant shrubs and vines within this habitat type included grapevines (*Vitis* spp.), amur and Japanese honeysuckles, and poison ivy. Common herbaceous species included hog peanut, spotted ladythumb (*Polygonum persicaria*), garlic mustard (*Allaria petiolata*), common ragweed, poison ivy, Virginia creeper (*Parthenocissus quinquefolia*), and creeping jenny (*Lysimachia nummularia*). Representative photographs of this habitat type are included in Attachment A. The locations of the mixed early successional/second growth forest habitat present within the Project area and the location and direction where each photograph was taken are shown on Figures 3 through 18.

Mature floodplain forest is generally limited to the expansive forested area at the southeast terminus of the Project near the confluence of the Little Miami and Ohio Rivers. This area is

heavily influenced by seasonal flooding. Forest canopy composition is largely silver maple (*Acer saccharinum*) and eastern cottonwood (*Populus deltoids*), with a subcanopy that includes box elder, American elm (*Ulmus Americana*), hackberry, green ash (*Fraxinus pennsylvanica*), and red maple (*Acer rubrum*). Common herbaceous species included hog peanut, great ragweed, poison ivy, creeping jenny, false nettle (*Boehmeria cylindrica*), stinging nettle (*Urtica dioica*), wingstem, and giant ironweed. Representative photographs of this habitat type are included in Attachment A. The locations of the mature floodplain forest habitat present within the Project area and the location and direction where each photograph was taken are shown on Figures 3 through 18.

Wetland habitat was identified at six locations within the Project area. The wetland habitat, totaling 3.27 acres, consisted of two different plant community types, an emergent community (0.26 acre) and a forested community (3.01 acres). The forested vegetation communities were generally dominated by silver maple, cottonwood, box elder, American sycamore (*Platanus occidentalis*), while the herbaceous plant communities were generally dominated by creeping jenny, false nettle, Gray's sedge (*Carex grayi*), poison ivy, common threesquare (*Schoenoplectus pungens*), curly dock (*Rumex crispus*), common blue violet (*Viola sororia*), and poison hemlock (*Conium maculatum*), reed canarygrass (*Phalaris arundinacea*), and whitegrass (*Leersia virginica*). Representative photographs of this habitat type are included in Attachment A. The locations of the wetland habitat present within the Project area and the location and direction where each photograph was taken are shown on Figures 3 through 18.

4.0 THREATENED AND ENDANGERED SPECIES DOCUMENT REVIEW AND HABITAT ASSESSMENT

4.1 Running Buffalo Clover

Running buffalo clover is a member of the Fabaceae (pea) family that produces erect flowering stems, 10 to 30 centimeters (cm) tall that send out long basal runners (stolons) (USFWS 2007a). The basal runners root at the nodes and produce leaves that have 1 to 2 cm long ovate-lanceolate stipules, whose tips gradually narrow to a distinctive point (USFWS 2007a). The plant produces 9 to 12 millimeters round white flowers from mid-April to June, with fruiting occurring from May to July. A single plant is defined as an individual rooted crown (USFWS 2007a). These

crowns may occur singly or be attached to other rooted crowns by stolons. Brooks (1983) provides a more comprehensive description of this species.

Historically, running buffalo clover was found from the central plains to the Appalachian Mountains. The species was once thought extinct until a single population was rediscovered in West Virginia in 1983 (Brooks 1983). Since then, populations have been discovered in Indiana, Kentucky, Missouri, and Ohio. Current populations are divided into three regions based on proximity to each other and overall habitat similarities. These regions are Appalachian (West Virginia and southeastern Ohio), Bluegrass (southwestern Ohio, central Kentucky, and Indiana), and Ozark (Missouri) (USFWS 2007a).

Habitat for running buffalo clover typically includes locations with partial or filtered sunlight and with moist, fertile soils that have been exposed to long-term moderate patterns of disturbance (CPC 2010; Natureserve 2015). It is thought that large herbivores like bison and cattle provided the necessary scarification of the soil for plants to germinate. Populations of this species are often found in the ecotone between forest and tallgrass prairie habitats (CPC 2010).

Additionally, others describe the habitat of this species as including mesophytic woodlands (Isely 1998), moist, well drained disturbed woods associated with streams (Gleason and Cronquist 1991), and open woods, borders, and forest clearings. It has been reported from a variety of habitats, including mesic woodlands, savannahs, floodplains, stream banks, sandbars (especially where old trails cross or parallel intermittent streams), grazed woodlots, infrequently mowed paths (e.g. in cemeteries, parks, and lawns), old logging roads, jeep trails, skidder trails, mowed wildlife openings within mature forest, and steep ravines (USFWS 2007a). No critical habitat has been designated for this species.

Running buffalo clover was listed by the USFWS as federally endangered on July 6, 1987 (50 FR 21478-21480) (USFWS 2007a). Specific threats identified by the Running Buffalo Clover Recovery Team in 1995 were: 1) any irreversible, catastrophic disturbance, such as road construction that completely destroys the habitat and/or kills all plants and seeds within the path of the disturbance; 2) the closing of forest canopies through succession to the point of severe shading, leading to reduced flower and fruit production; 3) the elimination of bison leading to reduced seed dispersal and release of competing vegetation; 4) low population size and associated fragility and susceptibility to catastrophe (including genetic diversity concerns);

5) excessive herbivory; 6) viral and fungal diseases; 7) reduction in pollinators; and 8) competition from non-native, invasive plant species (USFWS 2007a).

Running buffalo clover was rediscovered in Ohio in 1988 and is listed as endangered by the state of Ohio. According to the USFWS (2007), 18 extant populations and eight extirpated populations were known from Ohio, as of 2005. Populations have been primarily found in mesic forest and lawn habitats in Hamilton, Clermont, Brown, and Lawrence counties. Most of the known populations are reportedly located on county park lands and have been managed as to protect and encourage RBC. The first population on Federal land in Ohio was located in 2005 on Wayne National Forest (USFWS 2007).

CEC conducted a pedestrian survey of potentially suitable running buffalo clover habitats within the Project area, followed by a presence-absence survey on May 16, 18, and 19, 2016. Prior to conducting the RBC surveys, a pre-survey verification of a known RBC population was conducted at the Dinsmore Woods State Nature Preserve in Boone County, Kentucky. The purpose of this verification was to determine the precise flowering period and “phenophase” of the known population. This would allow the field survey to be conducted knowing the growth condition of the species to assist in better observation and species presence determinations. During the pre-survey site verification, photographs of the condition of the existing known population were made and the specific plant growth stage was noted. In addition, attention was directed toward observation of plant associations, soils, amount of vegetative shading, duration of disturbance, and amount of disturbance that were habitat characteristics of the known RBC population.

The RBC survey results for the Project study corridor and reference population location are presented below on Table 1.

TABLE 1 RUNNING BUFFALO CLOVER SURVEY RESULTS						
Survey Date	Site Name	Latitude	Longitude	Site Location	Habitat Type	RBC Present/Absent
May 5, 2016	Reference Population	39.000841	-84.814890	Dinsmore Woods State Nature Preserve Boone County, Kentucky	Walking trail leading to ridge top and adjacent cemetery. Site receives periodic disturbance and filtered sunlight.	Present
May 16 & 18, 2016	1	39.080896	-84.427648	Near Four Seasons Marina and the confluence of the Little Miami and Ohio Rivers	Bottomland hardwood forest bisected by a pipeline ROW/early successional habitat. Site receives periodic disturbance and filtered sunlight.	Absent
May 18, 2016	2	39.082402	-84.427663	Near Four Seasons Marina and the confluence of the Little Miami and Ohio Rivers	Trail or two track habitat that is located on an embankment that formerly functioned as a railroad corridor. Site receives periodic disturbance and filtered sunlight.	Absent
May 19, 2016	3A 3B 3C 3D	39.115040 39.115381 39.115666 39.115969	-84.443193 -84.443573 -84.443945 -84.444430	Adjacent to Turkey Ridge Park, the Ohio River Trail, and Humbert Avenue	Mowed park habitat with scattered overstory trees. Site receives periodic disturbance and filtered sunlight.	Absent
May 19, 2016	4	39.118429	-84.448547	Located at Schmidt Recreation Complex and adjacent to the Ohio River Trail	Mowed park habitat with scattered overstory trees. Site receives periodic disturbance and filtered sunlight.	Absent

The running buffalo clover habitat survey revealed approximately 5.06 acres or about 6 percent of the total Project area met the habitat considerations as potential RBC habitat (Figures 3 through 18). The potential RBC habitat that was identified included bottomland hardwood forest, trail or two track habitat, and mowed park habitat. The remaining areas within the Project study corridor do not provide suitable habitat conditions for the RBC based on one or more of the following habitat considerations: extent of disturbance, solar exposure, soil saturation, and/or a dense understory.

No running buffalo clover individuals or populations were identified during the subsequent presence-absence survey that was completed by CEC biologist\USFWS approved running buffalo clover surveyor Joey Van Skaik on May 16, 18, and 19, 2016. Background information, running buffalo clover natural history, survey methodology, and findings are presented in the standalone report entitled Running Buffalo Clover Survey Report (Attachment E). It is CEC's opinion that the project may affect, but is not likely to adversely affect the running buffalo clover.

4.2 Indiana Bat and Northern Long-Eared Bat

The federally endangered Indiana bat and federally threatened northern long-eared bat may potentially occur in Hamilton County. During winter, Indiana bats and northern long-eared bats hibernate in caves and abandoned mines. Summer habitat requirements for the species are not well defined but the following are considered important: (i) dead or live trees and snags with peeling or exfoliating bark, split tree trunk and/or branches, or cavities, which may be used as maternity roost areas; (ii) live trees (such as shag-bark hickory and oaks) which have exfoliating bark; (iii) stream corridors, riparian areas, and upland woodlots which provide forage sites.

CEC conducted a habitat assessment and pedestrian survey of potentially suitable Indiana and northern long-eared bat habitat within the Project area on May 16, 18, and 19, 2016. Small areas of trees are scattered through the Project area, with the primary forested area, consisting of approximately 150 acres of contiguous forested habitat, located at the southeastern terminus of the project near the confluence of the Little Miami and Ohio Rivers.

One hundred and seven (107) potential bat roost trees (PRTs) were identified during the pedestrian survey of the Project study corridor, as shown on Figures 3 through 18.

Approximately 73 percent (78) of the total PRTs were identified within the portion of the Project area located within primary forested area. The Project area within the primary forested area is heavily influenced by seasonal flooding. Forest canopy composition is largely silver maple (*Acer saccharinum*) and eastern cottonwood (*Populus deltoids*), with a subcanopy that includes box elder (*Acer negundo*), American elm (*Ulmus Americana*), hackberry (*Celtis occidentalis*), green ash (*Fraxinus pennsylvanica*), and red maple (*Acer rubrum*).

The canopy was fairly open with some opening above the ROW and in other inundated areas where trees had fell. Canopy trees averaged approximately 15-inch diameter at breast height (dbh) with larger trees scattered along the floodplain; primarily silver maple and eastern cottonwoods. Many of these trees had characteristics that made them suitable as bat roosts including sloughing bark, cracks and crevices, and hollowed boles and limbs.

The subcanopy was generally open with some areas of clutter as elevation increased out of the seasonal floodplain. Subcanopy trees averaged approximately 6 inches dbh and were more common when elevational changes increased. Overall, subcanopy was open with minimal clutter to prohibit flight underneath the canopy. The existing ROW and a separate ROW that bisected the project ROW near the eastern terminus provided optimal travel and foraging areas for Indiana bats and northern long-eared bats (if present).

Tree removal is planned to be kept to a minimum as approximately 72 percent of the replacement pipeline is proposed to be collocated within the existing pipeline ROW. The Project proposes to remove 10 PRTs. Nine (9) of the PRTs are located within the primary forested area, and one PRT is located along the Ohio River Trail, to the west of Setchell Street. The nine PRTs that are proposed to be removed in the primary forested area include three (3) declining silver maples, two (2) dead silver maples, and four (4) dead specimens where the species cannot be discerned. The PRT that is proposed to be removed along the Ohio River Trail is a dead black locust. A table summarizing characteristics of the potential habitat trees, including species, size, estimated percent canopy cover, condition, and interpreted quality, are presented below on Table 2. No human structures, including houses, barns, pavilions, sheds and cabins, will be impacted as part of the Project. Additionally, no winter hibernacula were identified within or near the Project area.

TABLE 2
POTENTIAL INDIANA BAT/NORTHERN LONG-EARED BAT HABITAT ROOST TREES PROPOSED TO BE REMOVED

Potential Roost Tree (PRT) Number	Species	Estimated % Canopy Cover	Condition	Diameter at Breast Height (inches)	Quality	Comment
8	<i>Acer saccharinum</i>	65%	Declining	10"	Low	Silver maple snag along edge of existing, maintained gas pipeline ROW.
9	<i>Acer saccharinum</i>	60%	Declining	20"	Low to Moderate	Mature silver maple along edge of existing, maintaining gas pipeline ROW with holes and dead branches.
10	<i>Acer saccharinum</i>	50%	Declining	12"	Low	Silver maple along edge of existing, maintained gas pipeline ROW with dead branches.
12	<i>Acer saccharinum</i>	60%	Dead	8"	Low	Dead silver maple along edge of existing, maintained gas pipeline ROW.
19	Not discernible	50%	Dead	10"	Low	Dead specimen along edge of existing, maintained gas pipeline ROW with holes and broken branches.
20	Not discernible	50%	Dead	8"	Low	Dead silver maple along edge of existing, maintained gas pipeline ROW.
47	Not discernible	55%	Dead	10"	Low	Dead snag along edge of existing, maintained gas pipeline ROW with holes.
50	Not discernible	55%	Dead	15"	Low to Moderate	Dead snag with split trunks near edge of existing, maintained gas pipeline ROW.
51	<i>Acer saccharinum</i>	55%	Dead	16"	Low to Moderate	Dead snag with holes and peeling bark near existing, maintained gas pipeline ROW.
96	<i>Robinia pseudoacacia</i>	60%	Dead	15"	Low	Dead specimen along the Ohio River Trail.

Note: Declining is when a tree exhibits noticeable deterioration such as trunk damage, bare branches, damaged roots, and/or loss of bark.

Tree-removal may remove potential roosting habitat for the Indiana bats and northern long-eared bats. This tree-removal will occur during the winter when the Indiana bat and northern long-eared bat are hibernating and not occupying roost trees. Therefore, project activities will not result in direct injury or mortality, only potential roosting habitat loss. It is CEC's opinion that the project may affect, but is not likely to adversely affect the Indiana bat and the northern long-eared bat.

4.3 Federally-Listed Endangered Mussel Species

As discussed in Section 2.0, several federally-listed endangered mussel species have been identified by the USFWS (Attachment B) and ODNR (Attachment C) as being known to occur, or having potential to occur, in Hamilton County. CEC conducted a pedestrian survey for potentially suitable federally-listed endangered mussel species habitats (perennial streams and rivers) within the Project area.

No perennial streams, rivers, or other potentially suitable habitat for freshwater mussel species was identified within the Project area. Based on the absence of freshwater mussels and suitable mussel habitat, it is CEC's opinion that the project will not effect to federally-listed mussel species.

5.0 CONCLUSIONS

No occurrences of federally-listed threatened, endangered, or proposed endangered species are known from the Project area.

No running buffalo clover individuals or populations were identified during habitat assessment and presence-absence survey completed by CEC on May 16, 18, and 19, 2016.

One hundred and seven (107) potential bat roost trees (PRTs) were identified during the pedestrian survey of the Project study corridor, as shown on Figures 3 through 18. Only ten (10) of the 107 PRTs are located within the proposed project limit-of-disturbance (LOD). The Project proposes to remove these 10 PRTs. Tree removal may remove potential roosting habitat for the Indiana bats and northern long-eared bats. This tree removal will occur during the winter when the Indiana bat and northern long-eared bat are hibernating and not occupying roost

Mr. Dan Everson – U.S. Fish & Wildlife Service
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trees. Therefore, project activities will not result in direct injury or mortality, only potential roosting habitat loss. It is our opinion that the project may affect, but is not likely to adversely affect the Indiana bat and the northern long-eared bat.

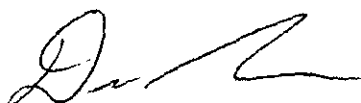
No perennial streams, rivers, or other potentially suitable habitat for freshwater mussel species was identified within the Project area.

6.0 CLOSING

On behalf of Duke Energy, CEC respectfully requests your concurrence with the above effect determinations for federally-listed endangered and proposed endangered species. If you have any questions or require additional information, please contact the undersigned at 513-985-0226.

Very truly yours, .

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.



Dustin M. Giesler
Staff Scientist



Joseph A. Van Skaik
Project Manager

Attachments: Figure 1 – Project Location Map
Figure 2 – Habitat Assessment Index Map
Figures 3 through 18 – Habitat Assessment Map
Attachment A – Site Photographs
Attachment B – USFWS Ohio County Distribution of Federally-Listed, Threatened, Endangered, Proposed, and Candidate Species, Revised September 2016
Attachment C – ODNR State Listed Wildlife Species for Hamilton County
Attachment D – ODNR Rare Native Ohio Plants Status List
Attachment E – Running Buffalo Clover Survey Report

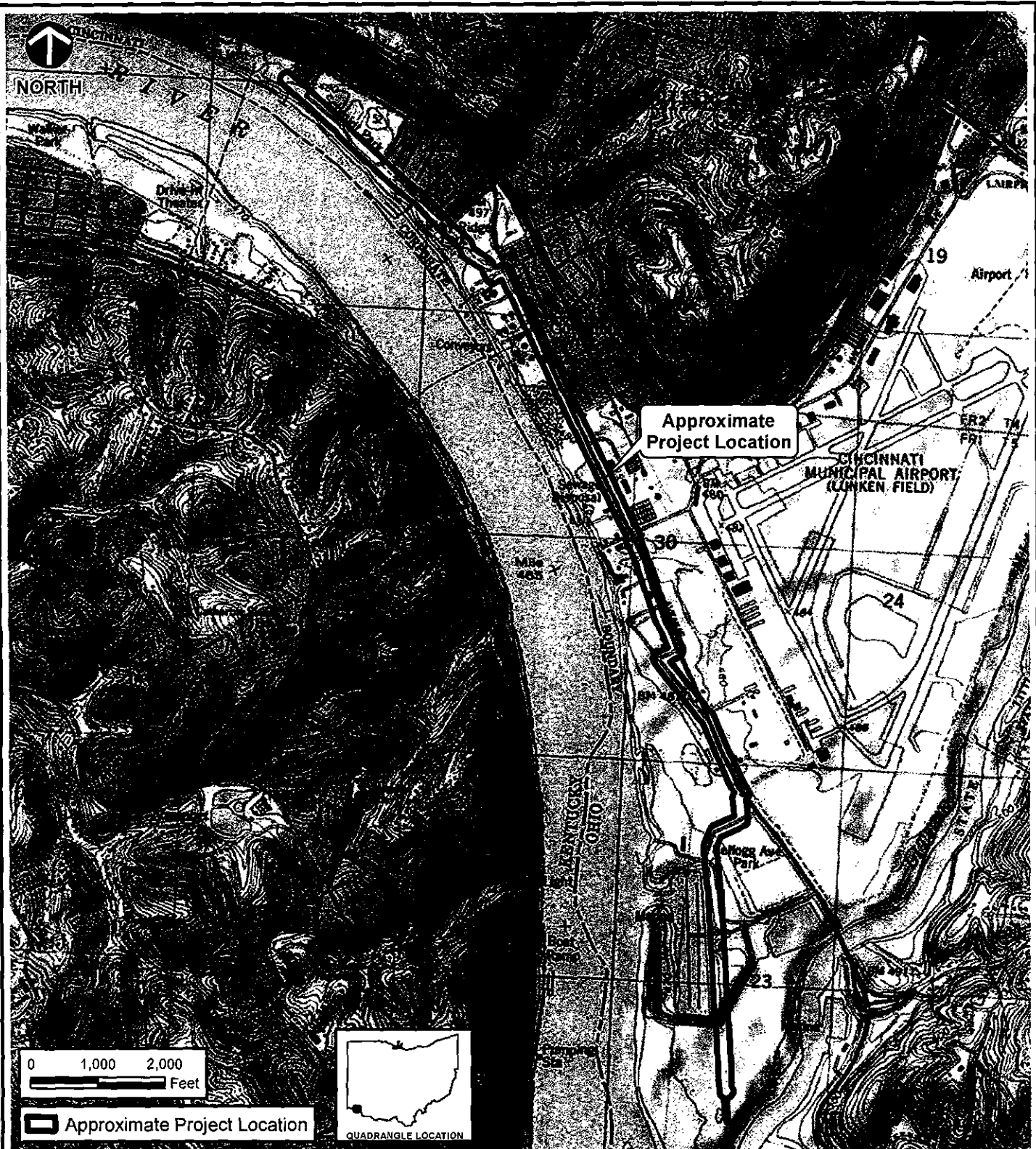
P:\2015\153-230\Final Documents\HA\LR - FINAL 153-230 USFWS Habitat Assessment.docx

7.0 REFERENCES

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FIGURES





SOURCE: USDA FSA NATIONAL AGRICULTURAL IMAGERY PROGRAM (NAIP) | HAMILTON COUNTY MOSAIC | IMAGE DATE: 2015.



Variable Width Study Corridor



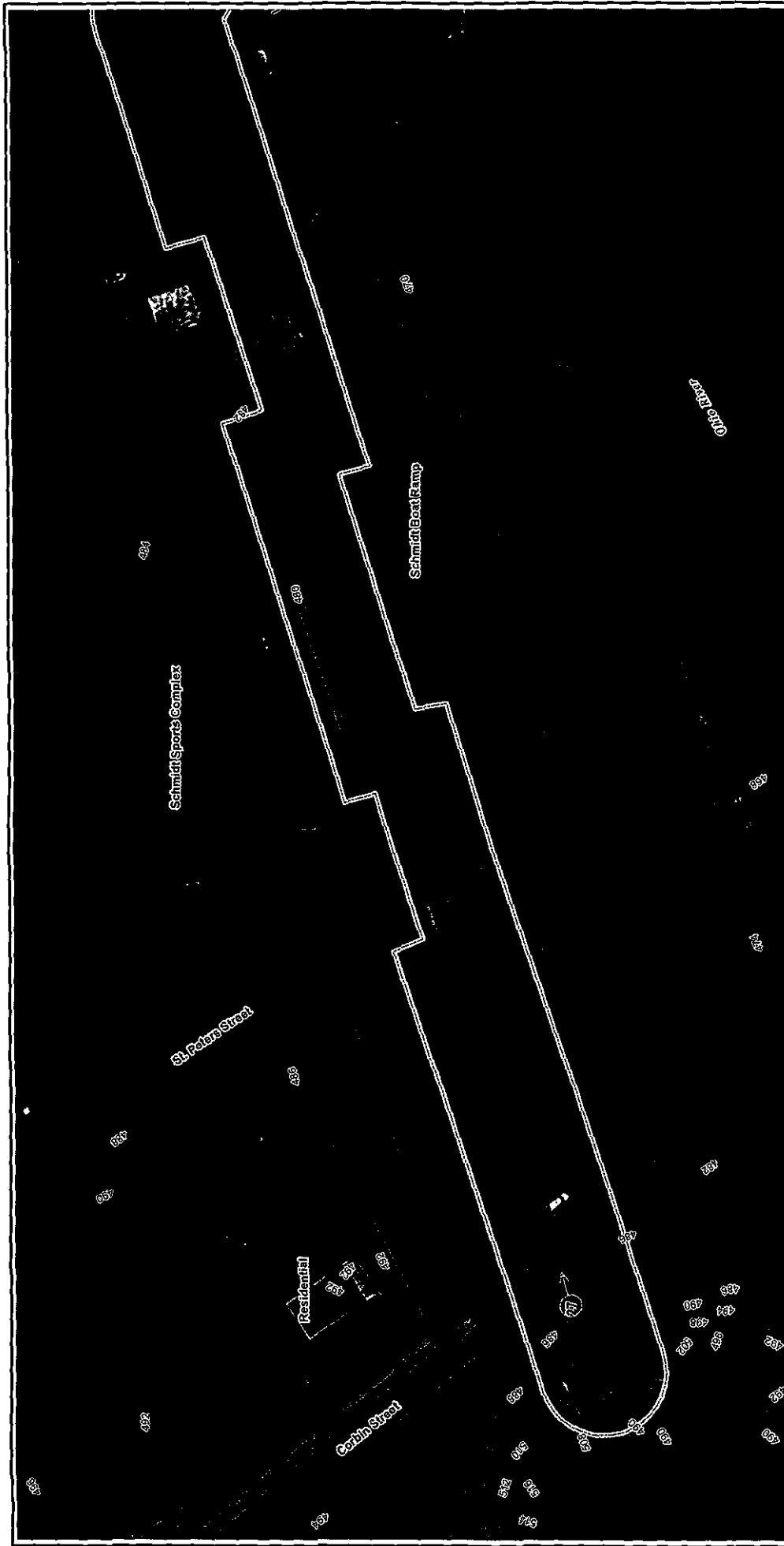
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THREATENED AND ENDANGERED SPECIES
 HABITAT ASSESSMENT INDEX MAP

DRAWN BY:	DMG	CHECKED BY:	JAV	APPROVED BY:	JAV	FIGURE NO.	2
DATE:	OCTOBER 24, 2016	DWG SCALE:	1" = 1,200'	PROJECT NO.:	153-230		

Signature on File



Legend

- Proposed Replacement Pipeline
- Variable Width Study Corridor
- Proposed Limit-of-Disturbance
- Delineated Wetland
- Palustrine Emergent (PEM)
- Palustrine Forested (PFO)
- Potential Indiana Bat
- Northern Long-Eared Bat
- Roost Tree
- Potential Running Buffalo
- Clover Habitat
- Ohio River or Backwater Area
- Existing Culvert
- 2-Foot Contour Interval
- Photograph Location and Direction

Notes: FULL EXTENT OF STUDY CORRIDOR IS WITHIN 100-YEAR FLOODPLAIN. NO STREAMS OR WATERBODIES WERE IDENTIFIED WITHIN THE STUDY CORRIDOR.

Scale: 1" = 75'

DATE: OCTOBER 24, 2016

DWG SCALE:

APPROVED BY: JAV

PROJECT NO.: 153-230

FIGURE NO.: 3

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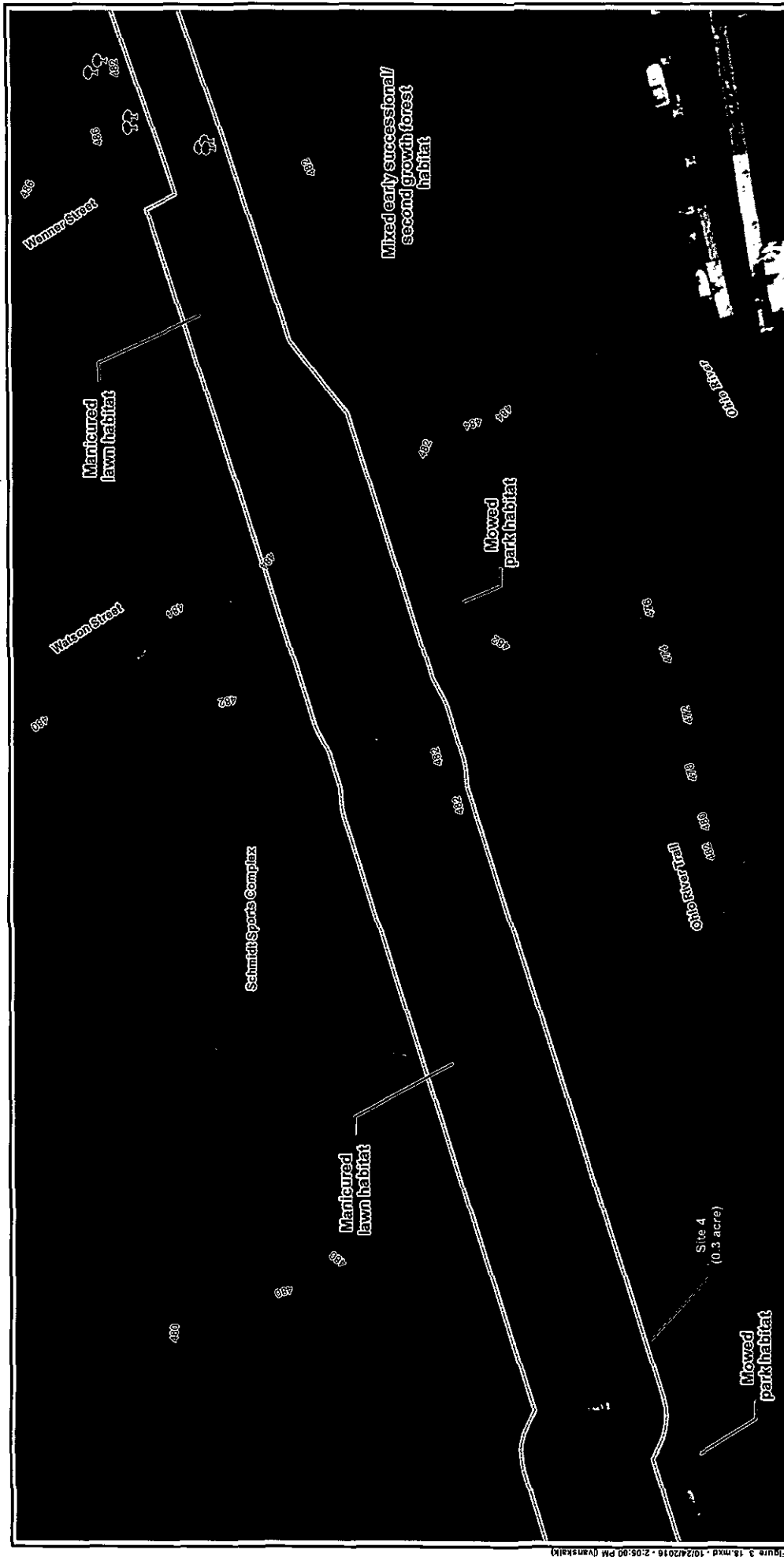
CINCINNATI, HAMILTON COUNTY, OHIO

THREATENED AND ENDANGERED SPECIES

HABITAT ASSESSMENT MAP

SOURCE: USDA NATIONAL AGRICULTURAL IMAGERY PROGRAM (NAIP) HAMILTON COUNTY MOSAIC. IMAGE DATE: 2015.

SOURCE: CAGIS 2-FOOT INTERVAL ELEVATION CONTOURS.



Legend

- Proposed Replacement Pipeline
- Variable Width Study Corridor
- Proposed Limit-of-Disturbance
- Delineated Wetland
- Palustrine Emergent (PEM)
- Palustrine Forested (PFO)
- Potential Indiana Bat
- Northern Long-Eared Bat
- Roost Tree
- Potential Running Buffalo
- Clover Habitat
- Ohio River or Backwater Area
- Existing Culvert
- 2-Foot Contour Interval
- Photograph Location
- and Direction

Notes: FULL EXTENT OF STUDY CORRIDOR IS WITHIN 100-YEAR FLOODPLAIN. NO STREAMS OR WATERBODIES WERE IDENTIFIED WITHIN THE STUDY CORRIDOR.

Scale

0 75 150 Feet

Overview Map

Source: USDA FSA NATIONAL AGRICULTURAL IMAGERY PROGRAM (NAIP) HAMILTON COUNTY MOSAIC, IMAGE DATE: 2015.
SOURCE: CAGIS 2-FOOT INTERVAL ELEVATION CONTOURS.

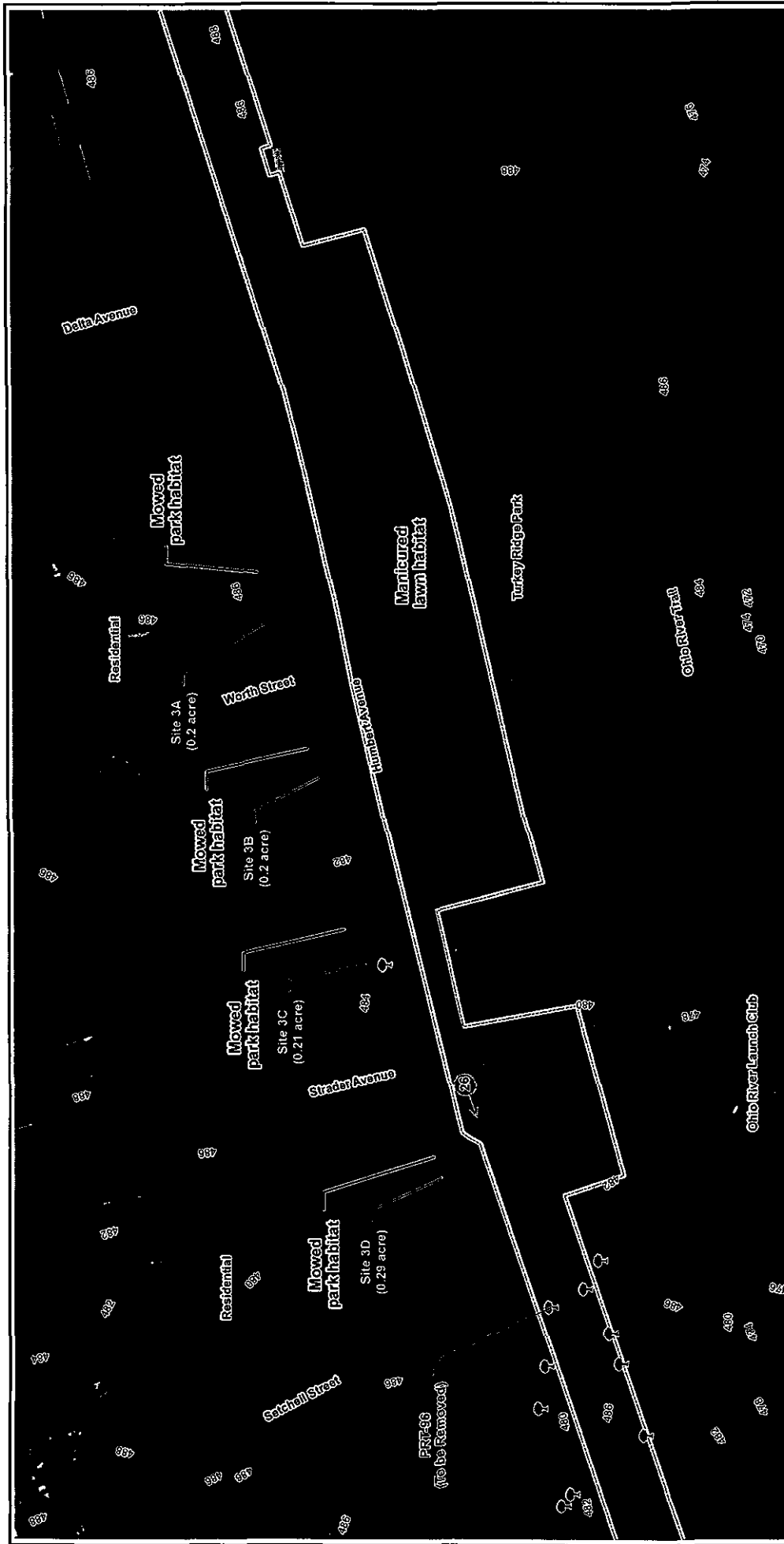
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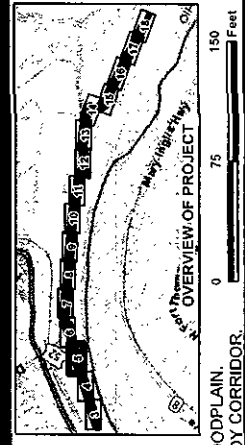
**THREATENED AND ENDANGERED SPECIES
HABITAT ASSESSMENT MAP**

DRAWN BY: DMG **CHECKED BY:** JAV **APPROVED BY:** JAV

DATE: OCTOBER 24, 2016 **DWG SCALE:** 1" = 75' **PROJECT NO:** 153-230 **FIGURE NO:** 4



SOURCE: USDA FSA NATIONAL AGRICULTURAL IMAGERY PROGRAM (NAIP) HAMILTON COUNTY MOSAIC, IMAGE DATE: 2015.
 SOURCE: CAGIS 2-FOOT INTERVAL ELEVATION CONTOURS.



Legend:

- Proposed Replacement Pipeline
- Variable Width Study Corridor
- Proposed Limit-of-Disturbance
- Delineated Wetland
- Palustrine Emergent (PEM)
- Palustrine Forested (PFO)
- Potential Indiana Bat
- Northern Long-Eared Bat
- Roost Tree

Legend:

- Potential Running Buffalo
- Clover Habitat
- Ohio River or Backwater Area
- Existing Culvert
- 2-Foot Contour Interval
- Photograph Location and Direction

Legend:

- North Arrow

NOTES: FULL EXTENT OF STUDY CORRIDOR IS WITHIN 100-YEAR FLOODPLAIN. NO STREAMS OR WATERBODIES WERE IDENTIFIED WITHIN THE STUDY CORRIDOR.

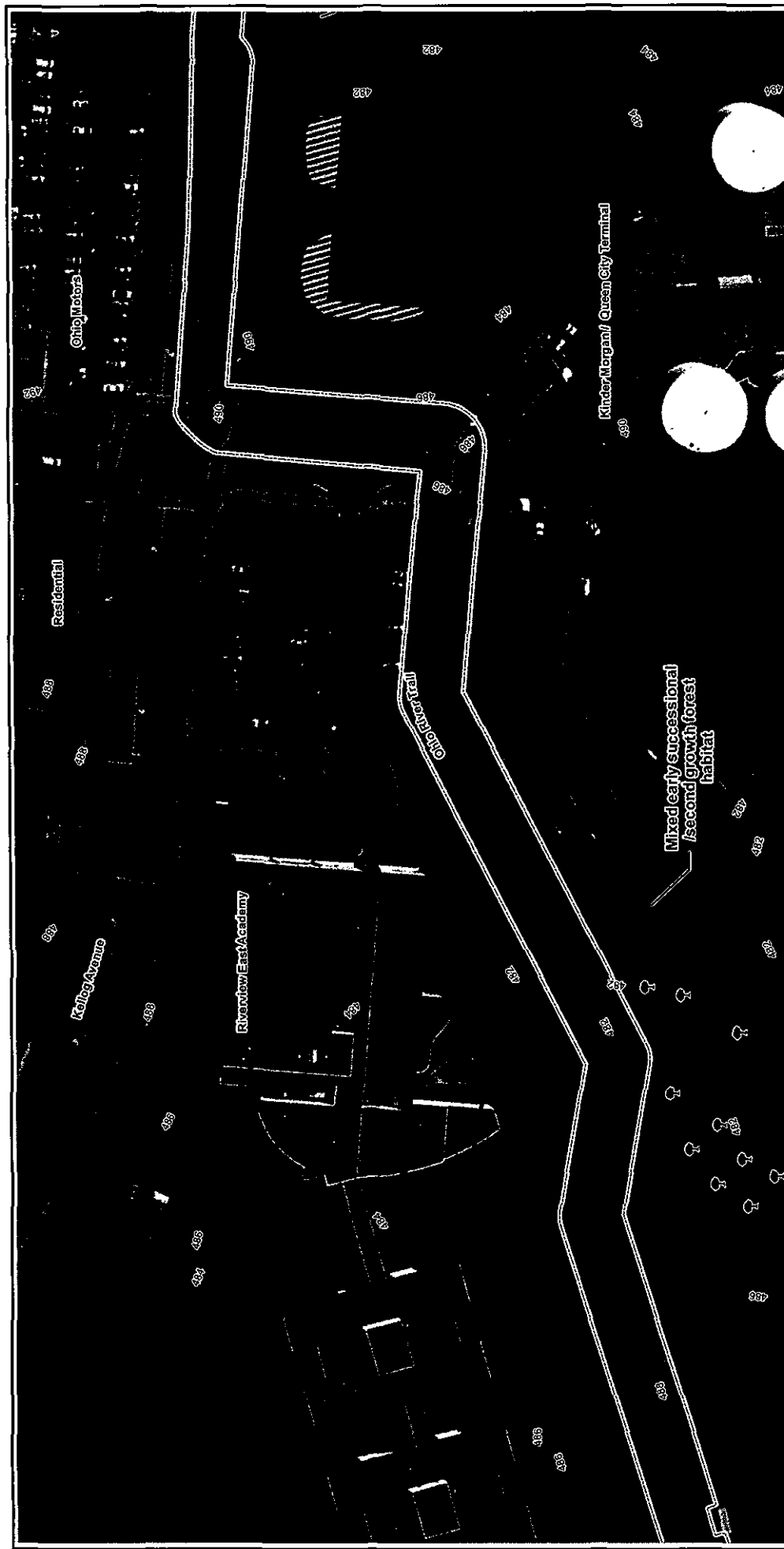
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 THREATENED AND ENDANGERED SPECIES
 HABITAT ASSESSMENT MAP

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 DATE: OCTOBER 24, 2016
 DWG SCALE: 1" = 75'

CHECKED BY: JAV
 APPROVED BY: JAV
 PROJECT NO: 153-230
 FIGURE NO: 5

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Legend

- Proposed Replacement Pipeline
- Variable Width Study Corridor
- Proposed Limit of Disturbance
- Delineated Wetland
- Palustrine Emergent (PEM)
- Palustrine Forested (PFO)
- Potential Indiana Bat
- Potential Long-Eared Bat
- Roost Tree
- Potential Running Buffalo
- Clover Habitat
- Ohio River or Backwater Area
- Existing Culvert
- 2-Foot Contour Interval
- Photograph Location and Direction

North Arrow

Scale

0 75 150 Feet

Overview of Project

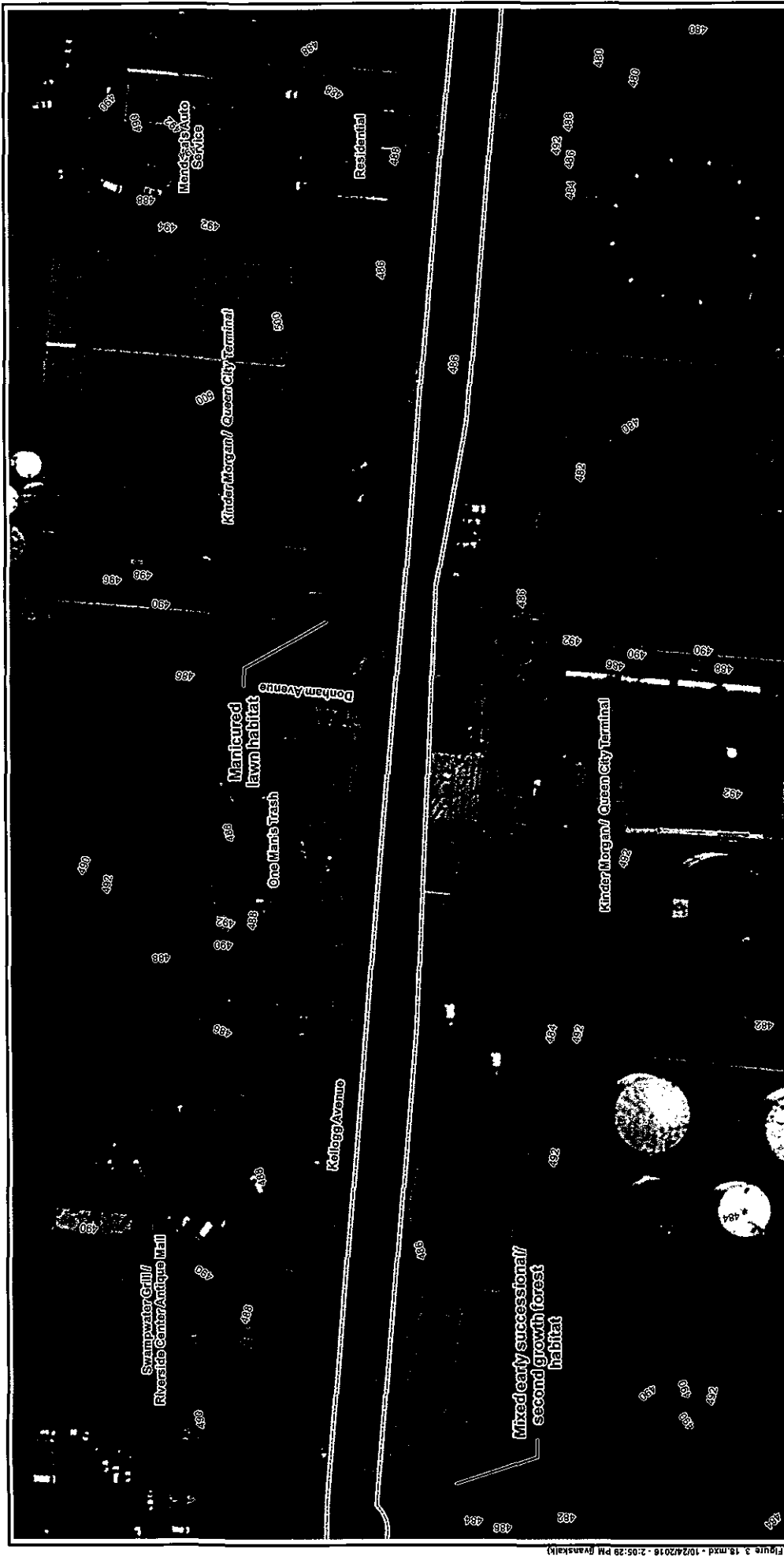
Notes: FULL EXTENT OF STUDY CORRIDOR IS WITHIN 100-YEAR FLOODPLAIN. NO STREAMS OR WATERBODIES WERE IDENTIFIED WITHIN THE STUDY CORRIDOR.

Source: USDA FSA NATIONAL AGRICULTURAL IMAGERY PROGRAM (NAIP) HAMILTON COUNTY MOSAIC. IMAGE DATE: 2015.
SOURCE: CAGIS 2-FOOT INTERVAL ELEVATION CONTOURS.

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THREATENED AND ENDANGERED SPECIES
HABITAT ASSESSMENT MAP

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DATE: OCTOBER 24, 2016
PROJECT NO.: 153-230
FIGURE NO.: 6



Legend

- Proposed Replacement Pipeline
- Variable Width Study Corridor
- Proposed Limit-of-Disturbance
- Designated Wetland
- Palustrine Emergent (PEM)
- Palustrine Forested (PFO)
- Potential Indiana Bat
- Northern Long-Eared Bat
- Roost Tree
- Potential Running Buffalo
- Clover Habitat
- Ohio River or Backwater Area
- Existing Culvert
- 2-Foot Contour Interval
- Photograph Location and Direction

North Arrow

Scale

0 75 150 Feet

Overview of Project

Notes: FULL EXTENT OF STUDY CORRIDOR IS WITHIN 100-YEAR FLOODPLAIN. NO STREAMS OR WATERBODIES WERE IDENTIFIED WITHIN THE STUDY CORRIDOR.

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LINE D000B PIPELINE REPLACEMENT PROJECT

CINCINNATI, HAMILTON COUNTY, OHIO

THREATENED AND ENDANGERED SPECIES

HABITAT ASSESSMENT MAP

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DATE: OCTOBER 24, 2016 **DWG SCALE:** 1" = 75' **PROJECT NO.:** 153-230 **FIGURE NO.:** 7

Signature on File



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 CINCINNATI, HAMILTON COUNTY, OHIO

THREATENED AND ENDANGERED SPECIES
HABITAT ASSESSMENT MAP

APPROVED BY: **JAV** | FIGURE NO: **9**

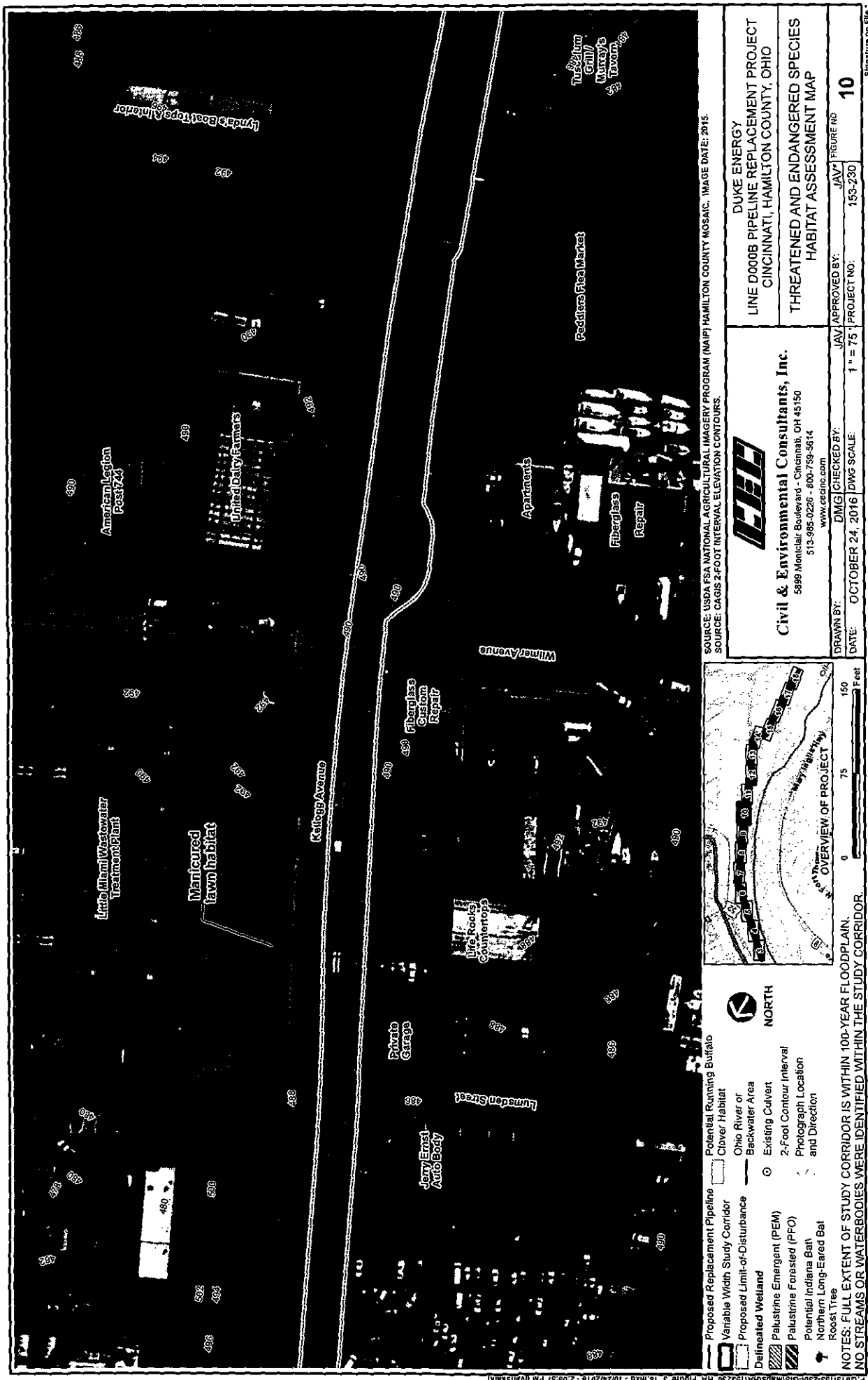
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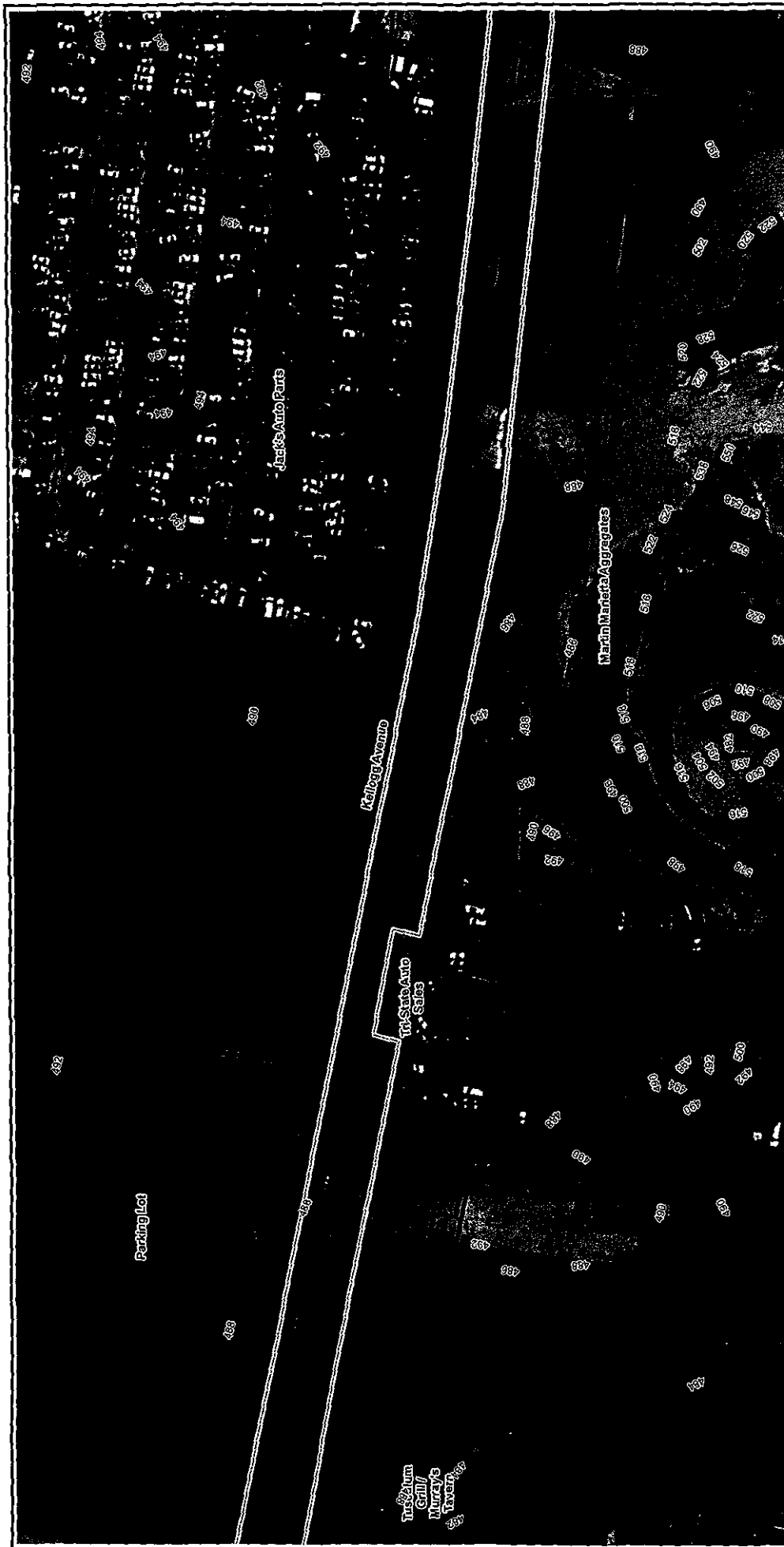
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OVERVIEW OF PROJECT

NOTES: FULL EXTENT OF STUDY CORRIDOR IS WITHIN 100-YEAR FLOODPLAIN. NO STREAMS OR WATERBODIES WERE IDENTIFIED WITHIN THE STUDY CORRIDOR.





Legend

- Proposed Replacement Pipeline
- Variable Width Study Corridor
- Proposed Limit-of-Disturbance
- Delineated Wetland
- Palustrine Emergent (PEM)
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- Northern Long-Eared Bat
- Roost Tree
- Potential Running Buffalo
- Clover Habitat
- Ohio River or Backwater Area
- Existing Culvert
- 2-Foot Contour Interval
- Photograph Location
- and Direction

Scale

0 75 150 Feet

Overview of Project

North Arrow

NORTH

NOTES: FULL EXTENT OF STUDY CORRIDOR IS WITHIN 100-YEAR FLOODPLAIN.
NO STREAMS OR WATERBODIES WERE IDENTIFIED WITHIN THE STUDY CORRIDOR.

Source: USDA FSA NATIONAL AGRICULTURAL IMAGERY PROGRAM (NAIP) HAMILTON COUNTY MOSAIC. IMAGE DATE: 2015.
Source: CAGIS 2-FOOT INTERVAL ELEVATION CONTOURS.

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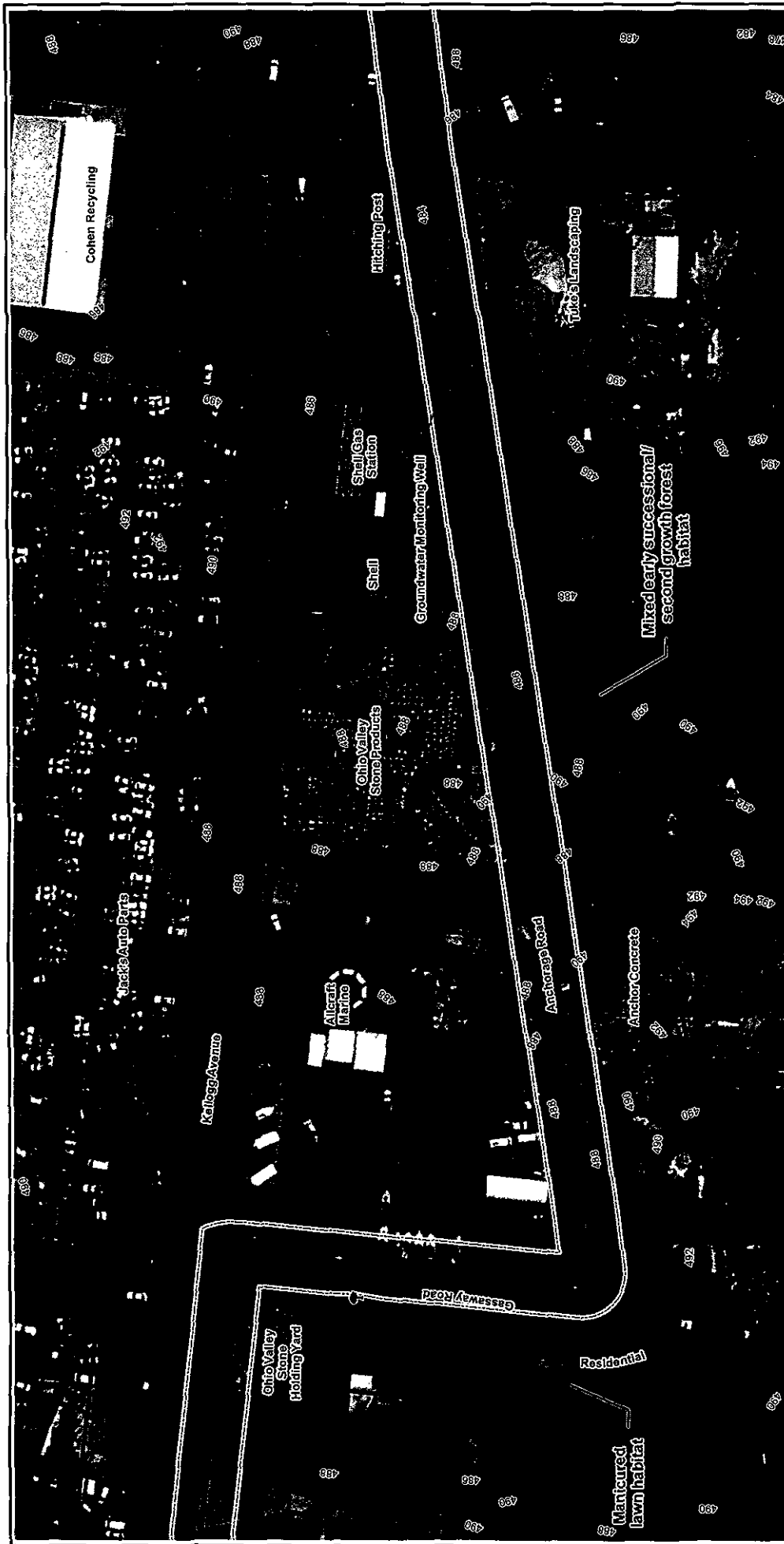
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CINCINNATI, HAMILTON COUNTY, OHIO
THREATENED AND ENDANGERED SPECIES
HABITAT ASSESSMENT MAP

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1" = 75'

DATE: OCTOBER 24, 2016 **PROJECT NO:** 153-230 **FIGURE NO:** 11

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 CINCINNATI, HAMILTON COUNTY, OHIO

THREATENED AND ENDANGERED SPECIES
HABITAT ASSESSMENT MAP

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DWG SCALE: 1" = 75'

FIGURE NO.: 12
PROJECT NO.: 153-230

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SOURCE: CAGIS 2-FOOT INTERVAL ELEVATION CONTOURS.

OVERVIEW OF PROJECT

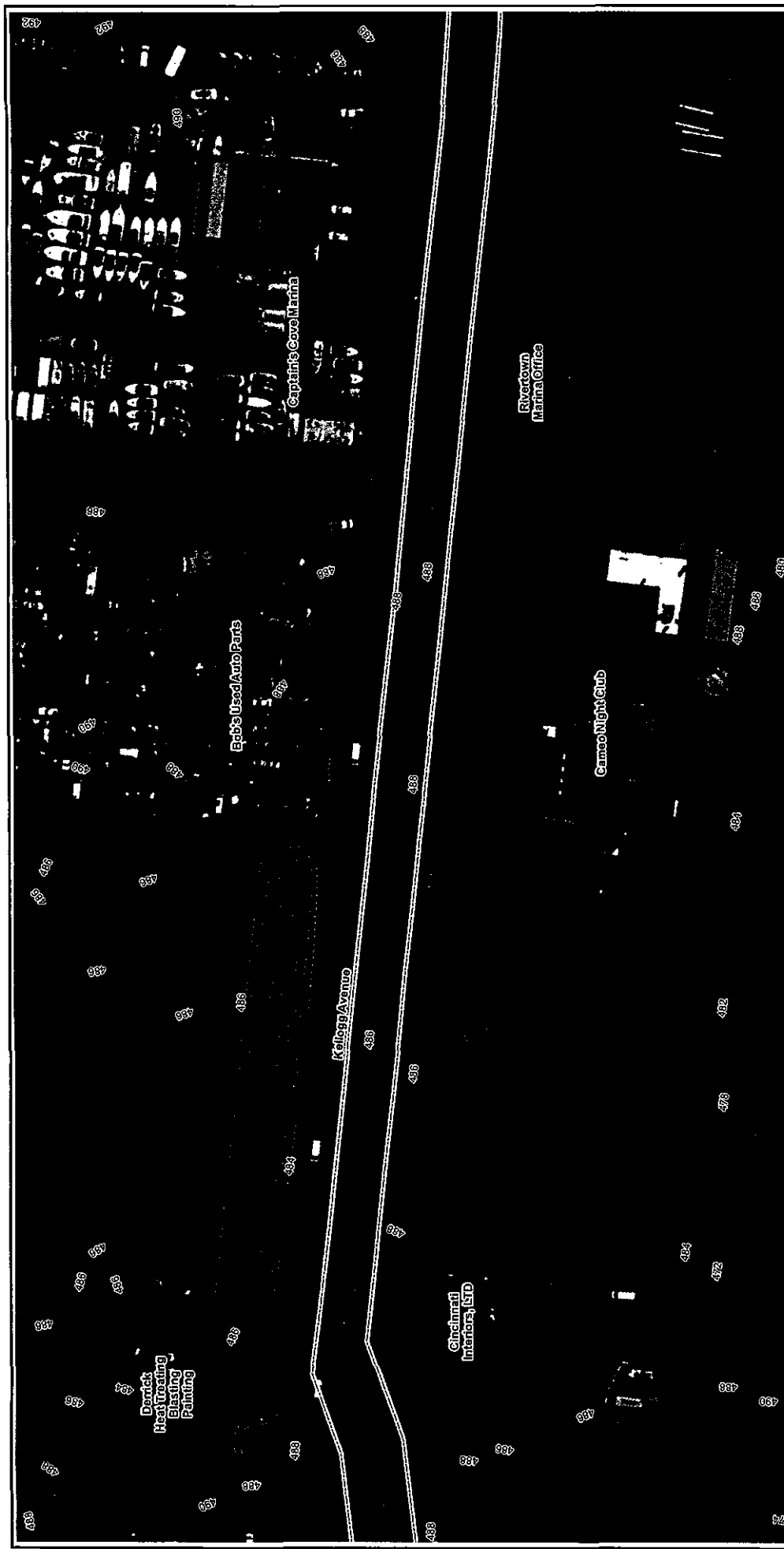
NOTES: FULL EXTENT OF STUDY CORRIDOR IS WITHIN 100-YEAR FLOODPLAIN
 NO STREAMS OR WATERBODIES WERE IDENTIFIED WITHIN THE STUDY CORRIDOR.

LEGEND:

- Proposed Replacement Pipeline
- Variable Width Study Corridor
- Proposed Limit-of-Disturbance
- Delineated Wetland
- Palustrine Emergent (PEM)
- Palustrine Forested (PFO)
- Potential Indiana Bat
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- Roost Tree
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- Clover Habitat
- Ohio River or Backwater Area
- Existing Culvert
- 2-Foot Contour Interval
- Photograph Location and Direction

Scale: 0 75 150 Feet

North Arrow: NORTH



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CINCINNATI, HAMILTON COUNTY, OHIO
THREATENED AND ENDANGERED SPECIES
HABITAT ASSESSMENT MAP

13

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 PROJECT NO: 153-230

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 CHECKED BY: JAV
 DATE: OCTOBER 24, 2016
 DWG SCALE: 1" = 75'
 FIGURE NO: 13

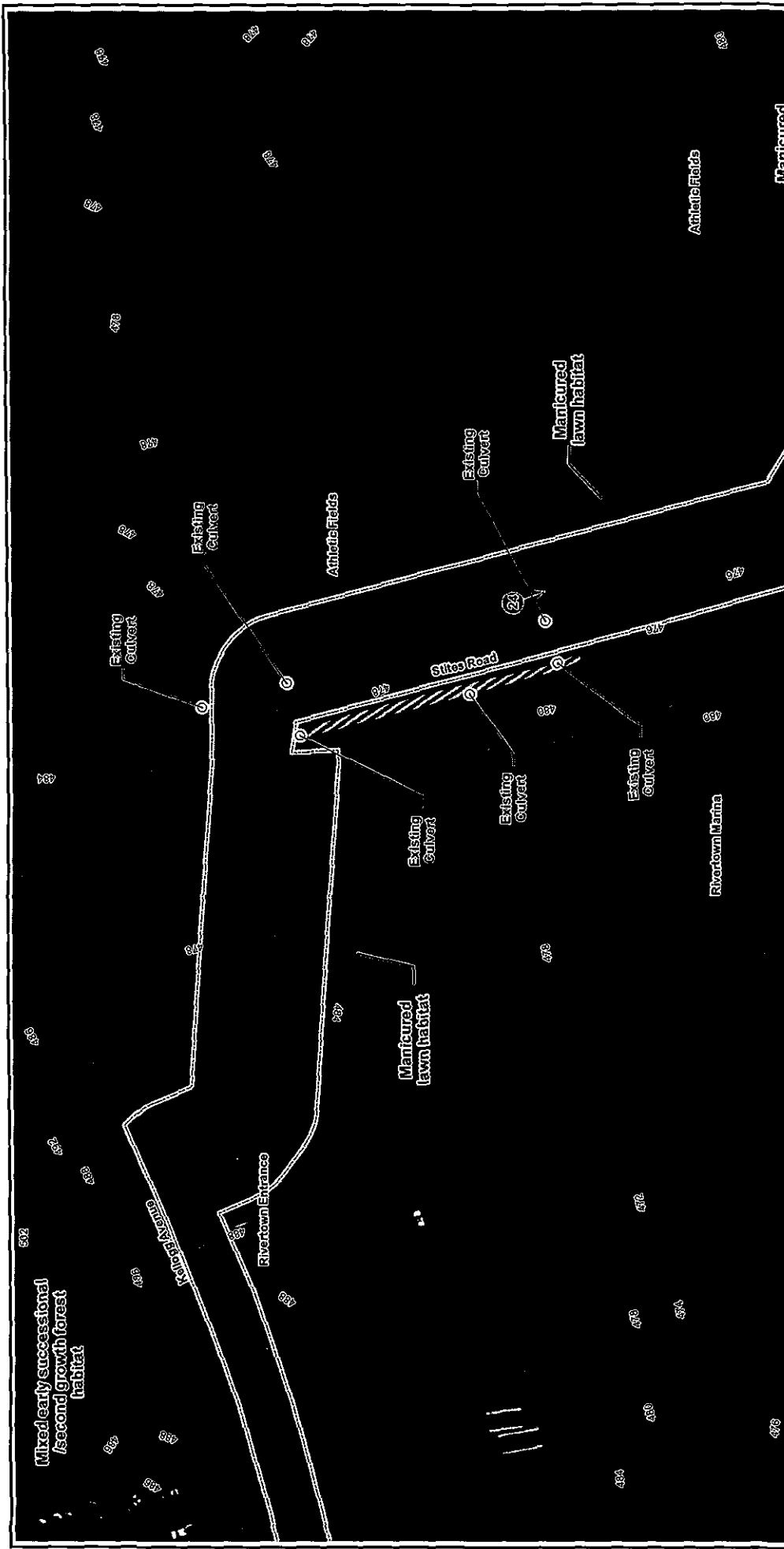
SOURCE: USDA FSA NATIONAL AGRICULTURAL IMAGERY PROGRAM (NAIP) HAMILTON COUNTY MOSAIC. IMAGE DATE: 2015.
 SOURCE: CAGIS 2-FOOT INTERVAL ELEVATION CONTOURS.

Legend

- Proposed Replacement Pipeline
- Variable Width Study Corridor
- Proposed Limit-of-Disturbance
- Delineated Wetland
- Palustrine Emergent (PEM)
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- Ohio River or Backwater Area
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- Photograph Location and Direction

OVERVIEW OF PROJECT

NOTES: FULL EXTENT OF STUDY CORRIDOR IS WITHIN 100-YEAR FLOODPLAIN.
 NO STREAMS OR WATERBODIES WERE IDENTIFIED WITHIN THE STUDY CORRIDOR.



Legend

- Proposed Replacement Pipeline
- Variable Width Study Corridor
- Proposed Limit-of-Disturbance
- Delineated Wetland
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- Ohio River or Backwater Area
- Existing Culvert
- 2-Foot Contour Interval
- Photograph Location and Direction

Scale

0 75 150 Feet

North Arrow

Overview Map

OVERVIEW OF PROJECT

NOTES: FULL EXTENT OF STUDY CORRIDOR IS WITHIN 100-YEAR FLOODPLAIN. NO STREAMS OR WATERBODIES WERE IDENTIFIED WITHIN THE STUDY CORRIDOR.

Source: USDA FSA NATIONAL AGRICULTURAL IMAGERY PROGRAM (NAIP) HAMILTON COUNTY MOSAIC. IMAGE DATE: 2015.

Source: CAGIS 2-FOOT INTERVAL ELEVATION CONTOURS.

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CINCINNATI, HAMILTON COUNTY, OHIO

THREATENED AND ENDANGERED SPECIES

HABITAT ASSESSMENT MAP

DRAWN BY: DMG

CHECKED BY: DMG

DATE: OCTOBER 24, 2016

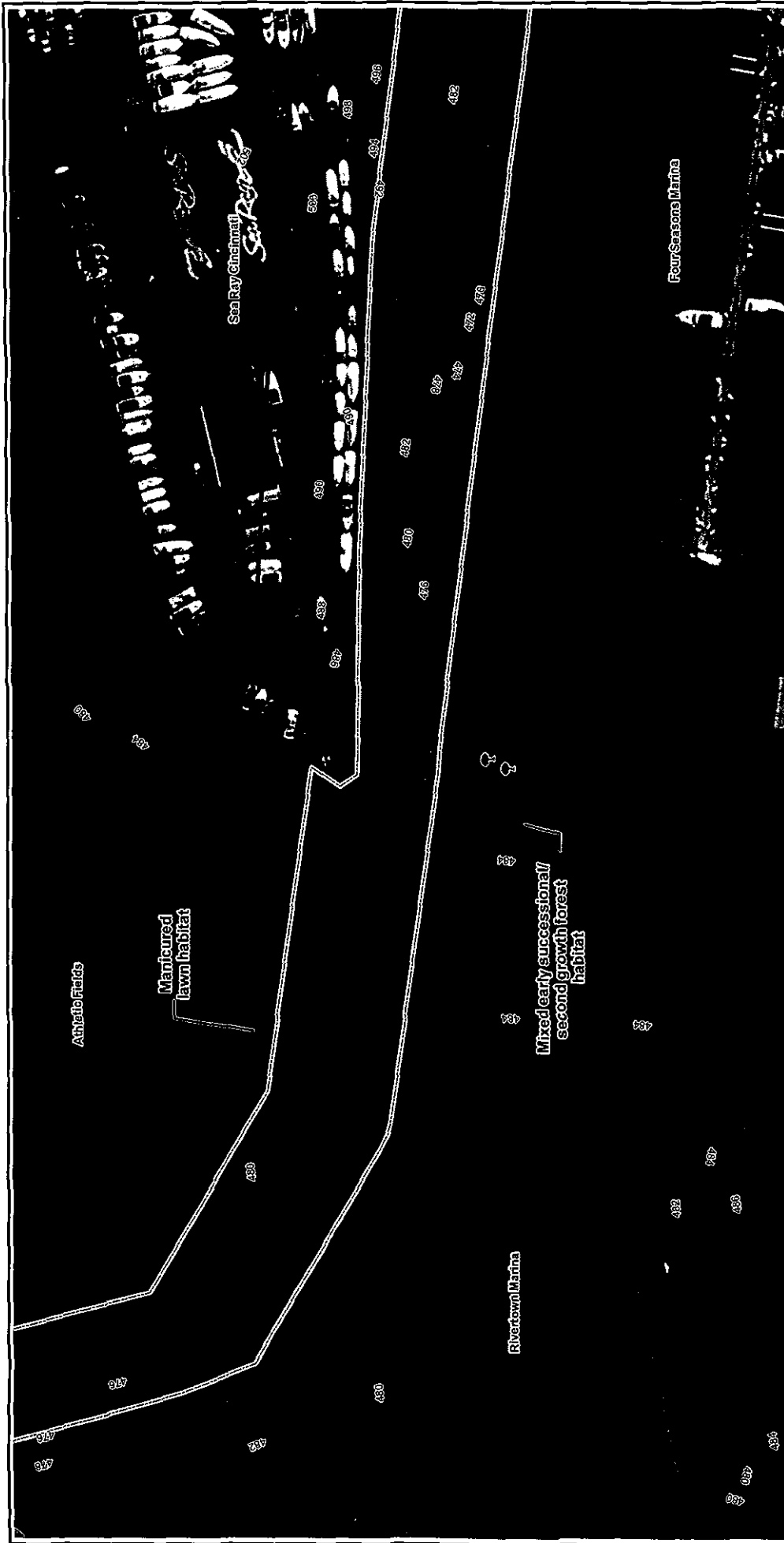
DWG SCALE: 1" = 75'

APPROVED BY: JAV

PROJECT NO: 153-230

FIGURE NO: 14

Signature on File



Legend

- Proposed Replacement Pipeline
- Variable Width Study Corridor
- Proposed Limit-of-Disturbance
- Delineated Wetland
- Palustrine Emergent (PEM)
- Palustrine Forested (PFO)
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- Existing Culvert
- 2-Foot Contour Interval
- Photograph Location
- and Direction

North Arrow

Scale

0 75 150 Feet

Overview Map

OVERVIEW OF PROJECT

0 75 150 Feet

Source: USDA, NRCS NATIONAL AGRICULTURAL IMAGERY PROGRAM (NAIP) HAMILTON COUNTY MOSAIC. IMAGE DATE: 2015.

Source: CAGIS 2-FOOT INTERVAL ELEVATION CONTOURS.

DUKE ENERGY

LINE D000B PIPELINE REPLACEMENT PROJECT

CINCINNATI, HAMILTON COUNTY, OHIO

THREATENED AND ENDANGERED SPECIES

HABITAT ASSESSMENT MAP

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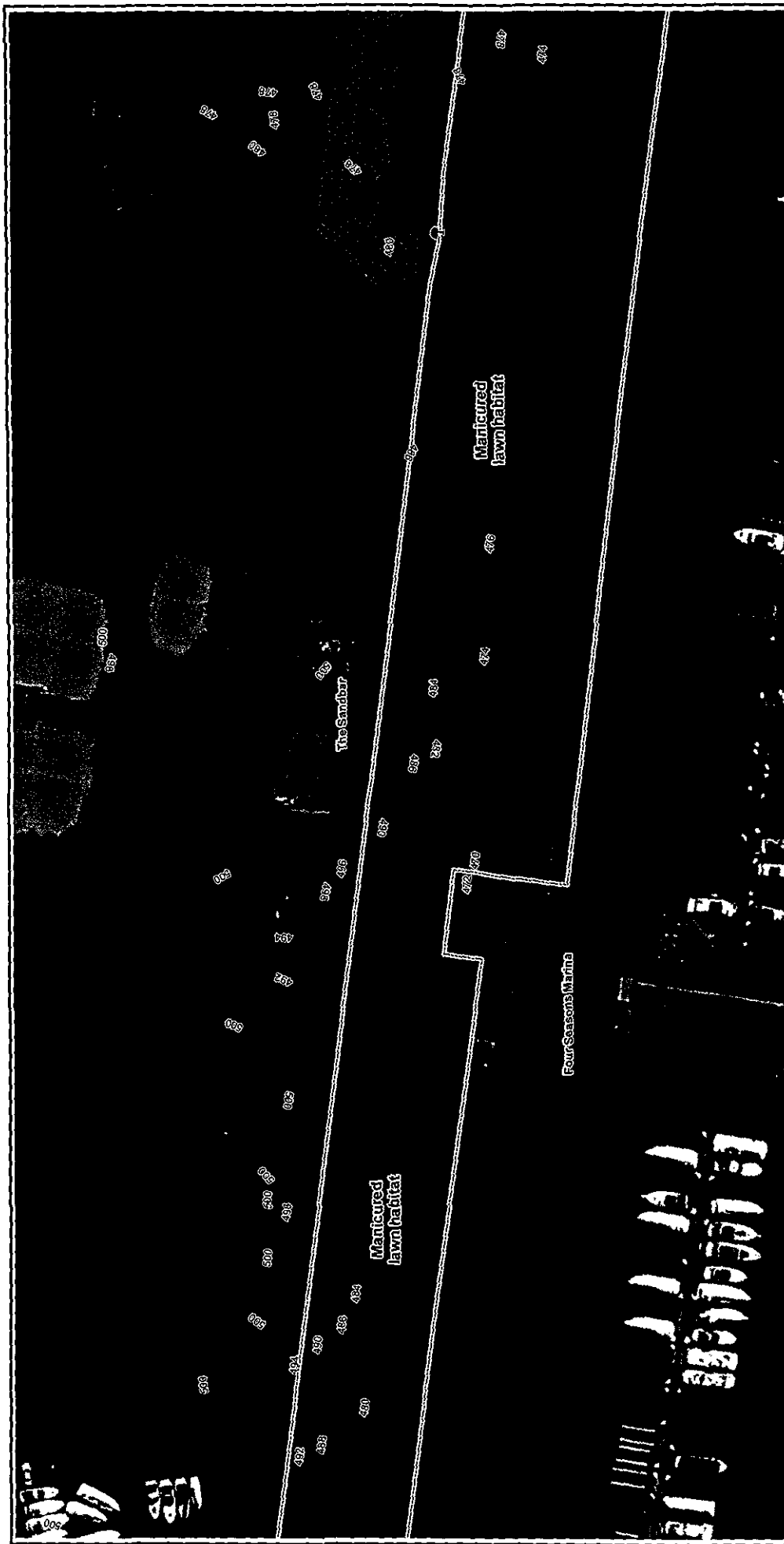
DATE: OCTOBER 24, 2016

DWG SCALE: 1" = 75'

PROJECT NO.: 153-230

FIGURE NO.: 15

NOTES: FULL EXTENT OF STUDY CORRIDOR IS WITHIN 100-YEAR FLOODPLAIN. NO STREAMS OR WATERBODIES WERE IDENTIFIED WITHIN THE STUDY CORRIDOR.



Legend

- Proposed Replacement Pipeline
- Variable Width Study Corridor
- Proposed Limit-of-Disturbance
- Delineated Wetland
- Palustrine Emergent (PEM)
- Palustrine Forested (PFO)
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- Northern Long-Eared Bat
- Roost Tree
- Potential Running Buffalo
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- Ohio River or Backwater Area
- Existing Culvert
- 2-Foot Contour Interval
- Photograph Location and Direction

Scale

0 75 150 Feet

North Arrow

Notes: FULL EXTENT OF STUDY CORRIDOR IS WITHIN 100-YEAR FLOODPLAIN. NO STREAMS OR WATERBODIES WERE IDENTIFIED WITHIN THE STUDY CORRIDOR.

OVERVIEW OF PROJECT

DUKE ENERGY

LINE D000B PIPELINE REPLACEMENT PROJECT

CINCINNATI, HAMILTON COUNTY, OHIO

THREATENED AND ENDANGERED SPECIES HABITAT ASSESSMENT MAP

Civil & Environmental Consultants, Inc.

5899 MapleClair Boulevard - Cincinnati, OH 45150

513-985-0225 - 800-759-5814

www.ceinc.com

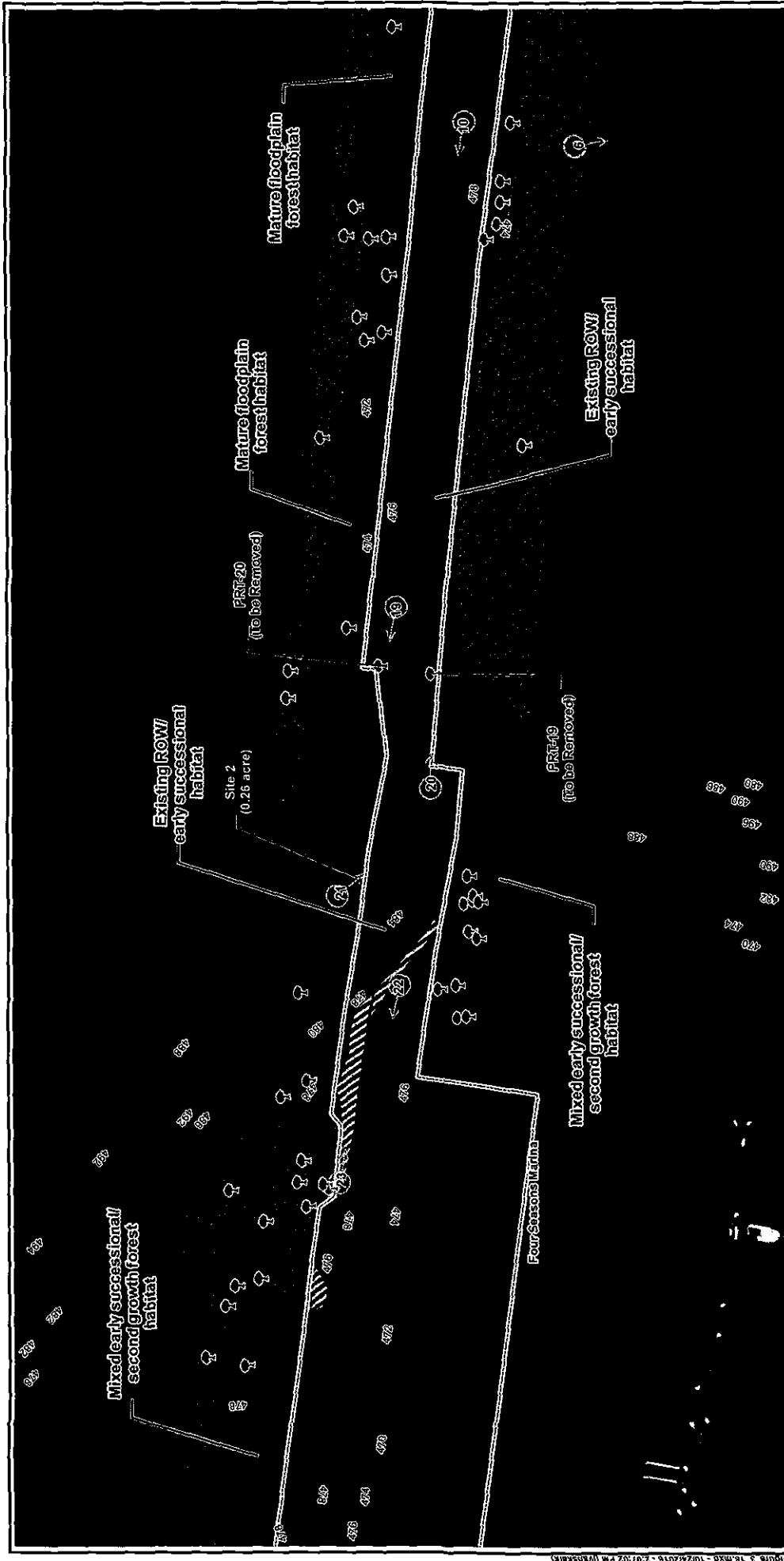
DMG

CHECKED BY: JAV

DATE: OCTOBER 24, 2016

PROJECT NO: 153-230

FIGURE NO: 16



Legend

- Proposed Replacement Pipeline
- Variable Width Study Corridor
- Proposed Limit of Disturbance
- Delineated Wetland
- Palustrine Emergent (PEM)
- Palustrine Forested (PFO)
- Potential Indiana Bat
- Northern Long-Eared Bat
- Roost Tree
- Potential Running Buffalo
- Clover Habitat
- Ohio River or Backwater Area
- Existing Culvert
- 2-Foot Contour Interval
- Photograph Location and Direction

Overview of Project

Scale

0 75 150 Feet

North Arrow

Notes: FULL EXTENT OF STUDY CORRIDOR IS WITHIN 100-YEAR FLOODPLAIN. NO STREAMS OR WATERBODIES WERE IDENTIFIED WITHIN THE STUDY CORRIDOR.

Civil & Environmental Consultants, Inc.
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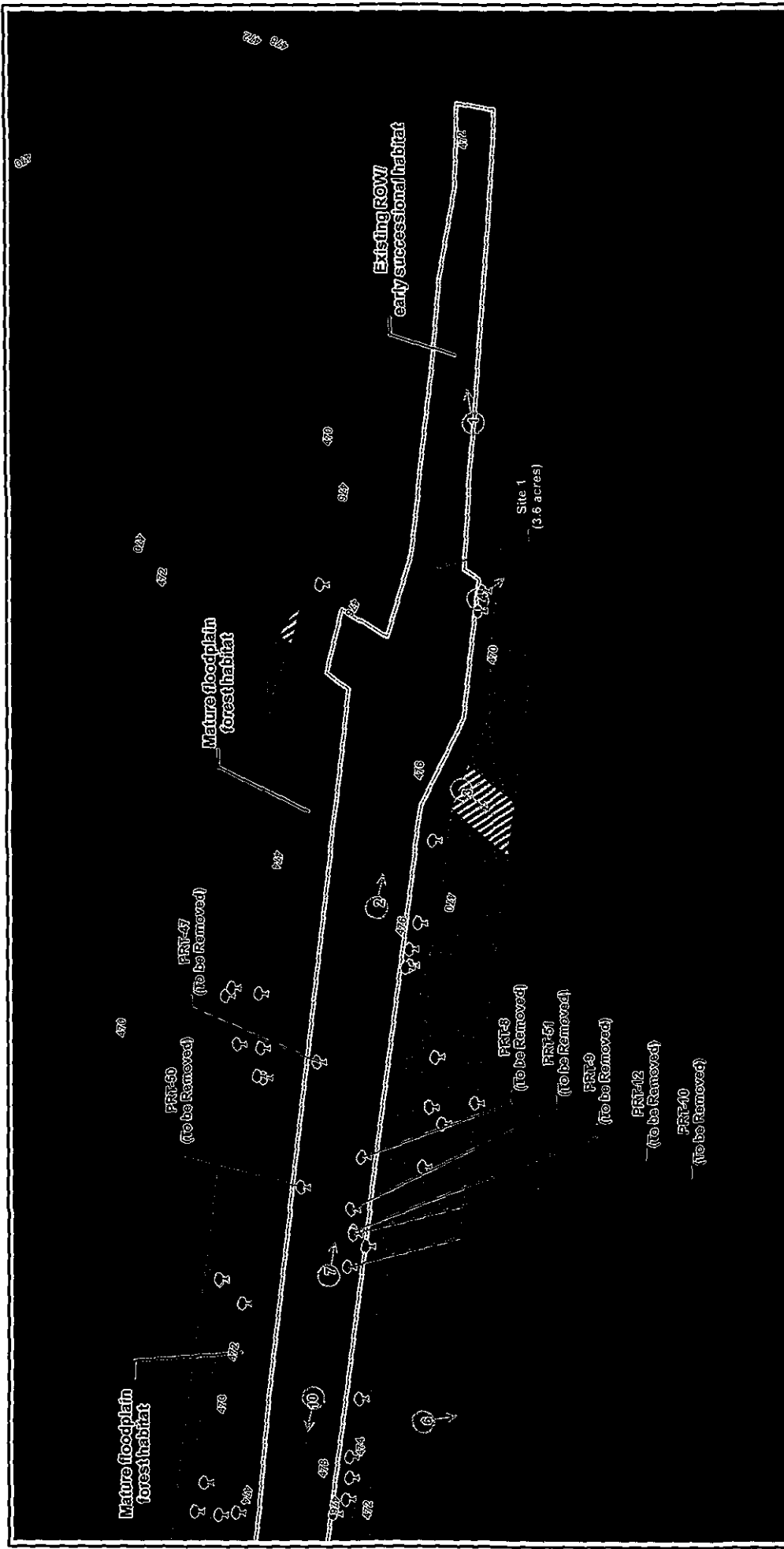
DUKE ENERGY
 LINE D0008 PIPELINE REPLACEMENT PROJECT
 CINCINNATI, HAMILTON COUNTY, OHIO

**THREATENED AND ENDANGERED SPECIES
 HABITAT ASSESSMENT MAP**

Drawn By: DMG **Checked By:** JAV **Approved By:** JAV

Date: OCTOBER 24, 2016 **Project No:** 153-230 **Figure No:** 17

Signature on File



DUKE ENERGY
 LINE D000B PIPELINE REPLACEMENT PROJECT
 CINCINNATI, HAMILTON COUNTY, OHIO

**THREATENED AND ENDANGERED SPECIES
 HABITAT ASSESSMENT MAP**

APPROVED BY: **JAN** PROJECT NO: **153-230**

DATE: **OCTOBER 24, 2016** DWG SCALE: **1" = 75'** FIGURE NO: **18**

Civil & Environmental Consultants, Inc.
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DRAWN BY: **DMG** CHECKED BY: **JAN**

Legend:

- Proposed Replacement Pipeline
- Variable Width Study Corridor
- Proposed Limit-of-Disturbance
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- Photograph Location and Direction

North Arrow

Scale: 0 75 150 Feet

OVERVIEW OF PROJECT

NOTES: FULL EXTENT OF STUDY CORRIDOR IS WITHIN 100-YEAR FLOODPLAIN
 NO STREAMS OR WATERBODIES WERE IDENTIFIED WITHIN THE STUDY CORRIDOR.

ATTACHMENT A

SITE PHOTOGRAPHS



Photograph 1. View of the maintained Line D000B ROW, south of proposed southern terminus of Project. Photograph taken facing south-southeast.



Photograph 2. View of existing Line D000B ROW at the southern terminus of study corridor. Photograph taken facing south.

Line D000B Pipeline Replacement Project
Cincinnati, Hamilton County, Ohio
CEC Project 153-230
Photographed on May 16, 18 and 19, 2016



Photograph 3. Representative view of emergent wetland habitat.
 Photograph taken facing north-northwest along existing, maintained Line D000B ROW.



Photograph 4. Representative view of the forested wetland habitat along the west side of the
 existing Line D000B ROW near the southern terminus of the Project.
 Photograph taken facing south-southwest.

Line D000B Pipeline Replacement Project
 Cincinnati, Hamilton County, Ohio
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Photograph 5. Fowler toad (*Anaxyrus fowleri*) from the forested wetland habitat near the southern terminus of the Project.



Photograph 6. View of the forested wetland habitat along the west side of the existing Line D000B ROW near the southern terminus of the Project.
Photograph taken facing west.

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Cincinnati, Hamilton County, Ohio
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Photograph 7. Representative view of elevated and maintained ROW near the southern terminus of the Project. Photograph taken facing south.

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Photograph 8. View of PRT-8.



Photograph 9. View of PRT-9

Line D000B Pipeline Replacement Project
Cincinnati, Hamilton County, Ohio
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Photograph 10. Representative view of the elevated and maintained Line D000B ROW, bisecting the forested wetland habitat at the southern terminus of the Project.
Photograph taken facing north.

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Cincinnati, Hamilton County, Ohio
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Photograph 11. View of PRT-10.



Photograph 12. View of PRT-12.

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Photograph 13. View of PRT-19.



Photograph 14. View of PRT-20.

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Photograph 15. View of PRT-47.



Photograph 16. View of PRT-50.

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Photograph 17. View of PRT-51.



Photograph 18. View of PRT-96.

Line D000B Pipeline Replacement Project
Cincinnati, Hamilton County, Ohio
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Photographed on May 16, 18 and 19, 2016



Photograph 19. Wild turkey (*Meleagris gallopavo*) from the mature forested floodplain habitat near the southern terminus of the Project.



Photograph 20. Elevated view of existing bermed and maintained Line D000B ROW. Note the wild turkeys. Photograph taken facing south.

Line D000B Pipeline Replacement Project
 Cincinnati, Hamilton County, Ohio
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 Photographed on May 16, 18 and 19, 2016



Photograph 21. View of potential running buffalo clover habitat along a trail or two track that is located on an embankment that formerly functioned as a railroad corridor, facing southwest.



Photograph 22. View of maintained Line D000B ROW.
Photograph taken facing south-southeast.

Line D000B Pipeline Replacement Project
Cincinnati, Hamilton County, Ohio
CEC Project 153-230
Photographed on May 16, 18 and 19, 2016



Photograph 23. View of emergent wetland habitat, facing south.



Photograph 24. View of the existing Line D000B ROW along the south side of Stites Road.
Photograph taken facing west-southwest.

Line D000B Pipeline Replacement Project
Cincinnati, Hamilton County, Ohio
CEC Project 153-230
Photographed on May 16, 18 and 19, 2016



Photograph 25. View of forested wetland habitat, facing east-northeast.



Photograph 26. View of trail and mowed park habitat on west side of Strader Avenue.
Photograph taken facing north-northwest.

Line D000B Pipeline Replacement Project
Cincinnati, Hamilton County, Ohio
CEC Project 153-230
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Photograph 27. View of the existing Line D000B ROW near the northern terminus of the Project. Photograph taken facing southeast.

Line D000B Pipeline Replacement Project
Cincinnati, Hamilton County, Ohio
CEC Project 153-230
Photographed on May 16, 18 and 19, 2016

ATTACHMENT B

**USFWS OHIO COUNTY DISTRIBUTION OF FEDERALLY-LISTED
THREATENED, ENDANGERED, PROPOSED & CANDIDATE SPECIES,
REVISED SEPTEMBER 2016**

Ohio

County Distribution of Federally-Listed Threatened, Endangered, Proposed, and Candidate Species

Revised September 2016

County	Species	Status	Habitat
Adams	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Fanshell (<i>Cyprogenia stegaria</i>) (= <i>C. irrorata</i>)	Endangered	Found in areas of packed sand and gravel at locations in a good current
	Pink mucket pearlymussel (<i>Lampsilis abrupta</i>)	Endangered	The lower Ohio River and its larger tributaries
	Rayed bean (<i>Villosa fabalis</i>)	Endangered	Smaller, headwater creeks, but they are sometimes found in large rivers
	Sheepnose (<i>Plethobasus cyphus</i>)	Endangered	Shallow areas in larger rivers and streams
	Snuffbox (<i>Epioblasma triquetra</i>)	Endangered	Small to medium-sized creeks and some larger rivers, in areas with a swift current
	Running buffalo clover (<i>Trifolium stoloniferum</i>)	Endangered	Disturbed bottomland meadows; disturbed sites that have shade during part of each day
Allen	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
Ashland	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
Ashtabula	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.

	Kirtland's warbler (<i>Dendroica kirtlandii</i>)	Endangered	Kirtland's warblers are known to migrate along the Lake Erie shoreline counties (Ashtabula, Cuyahoga, Erie, Lake, Lorain, Lucas, Ottawa, Sandusky counties) through Ohio in late April-May and late August-early October.
	Piping plover (<i>Charadrius melodus</i>)	Endangered	Beaches along shorelines of the Great Lakes
	Red Knot (Rufa) <i>Calidris canutus rufa</i>	Threatened	Present in Ohio during spring and fall migration
	Eastern massasauga (<i>Sistrurus catenatus</i>)	Proposed as Threatened	Wetlands and adjacent uplands
	Clubshell (<i>Pleurobema clava</i>)	Endangered	Found in coarse sand and gravel areas of runs and riffles within streams and small rivers
	Snuffbox (<i>Epioblasma triquetra</i>)	Endangered	Small to medium-sized creeks and some larger rivers, in areas with a swift current
Athens	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	American burying beetle (<i>Nicrophorus americanus</i>)	Endangered	
	Fanshell (<i>Cyprogenia stegaria</i>) (=C. <i>irrorata</i>)	Endangered	Found in areas of packed sand and gravel at locations in a good current
	Pink mucket (<i>Lampsilis abrupta</i>)	Endangered	The lower Ohio River and its larger tributaries
	Sheepnose (<i>Plethobasus cyphus</i>)	Endangered	Shallow areas in larger rivers and streams
	Snuffbox (<i>Epioblasma triquetra</i>)	Endangered	Small to medium-sized creeks and some larger rivers, in areas with a swift current
Auglaize	Indiana bat	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
Belmont	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
Brown	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests

	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Fanshell (<i>Cyprogenia stegaria</i>) (= <i>C. irrorata</i>)	Endangered	Found in areas of packed sand and gravel at locations in a good current
	Pink mucket pearlymussel (<i>Lampsilis abrupta</i>)	Endangered	The lower Ohio River and its larger tributaries
	Rayed bean (<i>Villosa fabalis</i>)	Endangered	Smaller, headwater creeks, but they are sometimes found in large rivers
	Sheepnose (<i>Plethobasus cyphus</i>)	Endangered	Shallow areas in larger rivers and streams
	Snuffbox (<i>Epioblasma triquetra</i>)	Endangered	Small to medium-sized creeks and some larger rivers, in areas with a swift current
	Running buffalo clover (<i>Trifolium stoloniferum</i>)	Endangered	Disturbed bottomland meadows; disturbed sites that have shade during part of each day
Butler	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Rayed bean (<i>Villosa fabalis</i>)	Endangered	Smaller, headwater creeks, but they are sometimes found in large rivers
Carroll	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
Champaign	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Eastern massasauga (<i>Sistrurus catenatus</i>)	Proposed as Threatened	Wetlands and adjacent uplands
Clark	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.

	Eastern massasauga (<i>Sistrurus catenatus</i>)	Proposed as Threatened	Wetlands and adjacent uplands
	Rayed bean (<i>Villosa fabalis</i>)	Endangered	Smaller, headwater creeks, but they are sometimes found in large rivers
	Eastern prairie fringed orchid (<i>Platanthera leucophaea</i>)	Threatened	Mesic to wet prairies and meadows
Clermont	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Fanshell (<i>Cyprogenia stegaria</i>) (= <i>C. irrorata</i>)	Endangered	Found in areas of packed sand and gravel at locations in a good current
	Pink mucket pearlymussel (<i>Lampsilis abrupta</i>)	Endangered	The lower Ohio River and its larger tributaries
	Rayed bean (<i>Villosa fabalis</i>)	Endangered	Smaller, headwater creeks, but they are sometimes found in large rivers
	Sheepnose (<i>Plethobasus cyphus</i>)	Endangered	Shallow areas in larger rivers and streams
	Snuffbox (<i>Epioblasma triquetra</i>)	Endangered	Small to medium-sized creeks and some larger rivers, in areas with a swift current
	Running buffalo clover (<i>Trifolium stoloniferum</i>)	Endangered	Disturbed bottomland meadows; disturbed sites that have shade during part of each day
Clinton	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Eastern massasauga (<i>Sistrurus catenatus</i>)	Proposed as Threatened	Wetlands and adjacent uplands
Columbiana	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Eastern massasauga (<i>Sistrurus catenatus</i>)	Proposed as Threatened	Wetlands and adjacent uplands
Coshocton	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests

	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Clubshell <i>(Pleurobema clava)</i>	Endangered	Found in coarse sand and gravel areas of runs and riffles within streams and small rivers
	Fanshell (<i>Cyprogenia stegaria</i> (= <i>C. irrorata</i>)	Endangered	Found in areas of packed sand and gravel at locations in a good current
	Purple cat's paw pearlymussel <i>(Endangeredpioblasma obliquata obliquata)</i>	Endangered	Gravel riffles of medium to large rivers
	Rabbitsfoot <i>Quadrula cylindrica cylindrica</i>	Threatened	
	Rabbitsfoot <i>Quadrula cylindrica cylindrica</i>	Critical Habitat	Walhonding River
	Rayed bean <i>(Villosa fabalis)</i>	Endangered	Smaller, headwater creeks, but they are sometimes found in large rivers
	Sheepnose <i>(Plethobasus cyphus)</i>	Endangered	Shallow areas in larger rivers and streams
	Snuffbox <i>(Epioblasma triquetra)</i>	Endangered	Small to medium-sized creeks and some larger rivers, in areas with a swift current
Crawford	Indiana bat <i>(Myotis sodalis)</i>	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Eastern massasauga <i>(Sistrurus catenatus)</i>	Proposed as Threatened	Wetlands and adjacent uplands
Cuyahoga	Indiana bat <i>(Myotis sodalis)</i>	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Kirtland's warbler (<i>Dendroica kirtlandii</i>)	Endangered	Kirtland's warblers are known to migrate along the Lake Erie shoreline counties (Ashtabula, Cuyahoga, Erie, Lake, Lorain, Lucas, Ottawa, Sandusky counties) through Ohio in late April-May and late August-early October.
	Piping plover <i>(Charadrius melodus)</i>	Endangered	Beaches along shorelines of the Great Lakes
	Red Knot (Rufa) <i>Calidris canutus rufa</i>	Threatened	Present in Ohio during spring and fall migration
Darke	Indiana bat <i>(Myotis sodalis)</i>	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests

	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Rayed bean <i>(Villosa fabalis)</i>	Endangered	Smaller, headwater creeks, but they are sometimes found in large rivers
Defiance	Indiana bat <i>(Myotis sodalis)</i>	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Copperbelly water snake <i>(Nerodia erythrogaster neglecta)</i>	Threatened	Wooded and permanently wet areas such as oxbows, sloughs, brushy ditches and floodplain woods
	Clubshell <i>(Pleurobema clava)</i>	Endangered	Found in coarse sand and gravel areas of runs and riffles within streams and small rivers
	Northern riffleshell <i>(Epioblasma torulosa rangiana)</i>	Endangered	Large streams and small rivers in firm sand of riffle areas; also occurs in Lake Erie
	Rayed bean <i>(Villosa fabalis)</i>	Endangered	Smaller, headwater creeks, but they are sometimes found in large rivers
	White cat's paw pearlymussel <i>(Epioblasma obliquata perobliqua)</i>	Endangered	Firm sand or gravel riffles in small streams and medium to large rivers
Delaware	Indiana bat <i>(Myotis sodalis)</i>	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Rayed bean <i>(Villosa fabalis)</i>	Endangered	Smaller, headwater creeks, but they are sometimes found in large rivers
	Snuffbox <i>(Epioblasma triquetra)</i>	Endangered	Small to medium-sized creeks and some larger rivers, in areas with a swift current
Erie	Indiana bat <i>(Myotis sodalis)</i>	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Kirtland's warbler (<i>Dendroica kirtlandii</i>)	Endangered	Kirtland's warblers are known to migrate along the Lake Erie shoreline counties (Ashtabula, Cuyahoga, Erie, Lake, Lorain, Lucas, Ottawa, Sandusky counties) through Ohio in late April-May and late August-early October.

	Eastern massasauga (<i>Sistrurus catenatus</i>)	Proposed as Threatened	Wetlands and adjacent uplands
	Lakeside daisy (<i>Hymenoxys herbacea</i>) (Formerly <i>H. acaulis</i>) var. <i>glabra</i>)	Threatened	Dry rocky prairies; limestone rock surfaces including outcrops and quarries
	Piping plover (<i>Charadrius melodus</i>)	Endangered	Beaches along shorelines of the Great Lakes
	Piping plover (<i>Charadrius melodus</i>)	Critical Habitat Designated	
	Red Knot (Rufa) <i>Calidris canutus rufa</i>	Threatened	Present in Ohio during spring and fall migration
Fairfield	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Eastern massasauga (<i>Sistrurus catenatus</i>)	Proposed as Threatened	Wetlands and adjacent uplands
Fayette	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Eastern massasauga (<i>Sistrurus catenatus</i>)	Proposed as Threatened	Wetlands and adjacent uplands
Franklin	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Scioto madtom (<i>Noturus trautmani</i>)	Endangered	Stream riffles of moderate flow over sandy gravel bottom
	Clubshell (<i>Pleurobema clava</i>)	Endangered	Found in coarse sand and gravel areas of runs and riffles within streams and small rivers
	Northern riffleshell (<i>Epioblasma torulosa rangiana</i>)	Endangered	Large streams and small rivers in firm sand of riffle areas; also occurs in Lake Erie
	Rabbitsfoot <i>Quadrula cylindrica cylindrica</i>	Threatened	
	Rayed bean (<i>Villosa fabalis</i>)	Endangered	Smaller, headwater creeks, but they are sometimes found in large rivers
	Snuffbox (<i>Epioblasma triquetra</i>)	Endangered	Small to medium-sized creeks and some larger rivers, in areas with a swift current

	Rusty patched bumble bee <i>Bombus affinis</i>	Proposed as Endangered	Grasslands with flowering plants from April through October, underground and abandoned rodent cavities or clumps of grasses above ground as nesting sites, and undisturbed soil for hibernating queens to overwinter.
Fulton	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Rayed bean (<i>Villosa fabalis</i>)	Endangered	Smaller, headwater creeks, but they are sometimes found in large rivers
Gallia	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Fanshell (<i>Cyprogenia stegaria</i>) (= <i>C. irrorata</i>)	Endangered	Found in areas of packed sand and gravel at locations in a good current
	Pink mucket pearlymussel (<i>Lampsilis abrupta</i>)	Endangered	The lower Ohio River and its larger tributaries
	Sheepnose (<i>Plethobasus cyphus</i>)	Endangered	Shallow areas in larger rivers and streams
	Snuffbox (<i>Epioblasma triquetra</i>)	Endangered	Small to medium-sized creeks and some larger rivers, in areas with a swift current
Geauga	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
Greene	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Eastern massasauga (<i>Sistrurus catenatus</i>)	Proposed as Threatened	Wetlands and adjacent uplands
	Clubshell (<i>Pleurobema clava</i>)	Endangered	Found in coarse sand and gravel areas of runs and riffles within streams and small rivers

	Rayed bean (<i>Villosa fabalis</i>)	Endangered	Smaller, headwater creeks, but they are sometimes found in large rivers
	Snuffbox (<i>Epioblasma triquetra</i>)	Endangered	Small to medium-sized creeks and some larger rivers, in areas with a swift current
Guernsey	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
Hamilton	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Fanshell (<i>Cyprogenia stegaria</i>) (= <i>C. irrorata</i>)	Endangered	Found in areas of packed sand and gravel at locations in a good current
	Pink mucket pearlymussel (<i>Lampsilis abrupta</i>)	Endangered	The lower Ohio River and its larger tributaries
	Rayed bean (<i>Villosa fabalis</i>)	Endangered	Smaller, headwater creeks, but they are sometimes found in large rivers
	Sheepnose (<i>Plethobasus cyphus</i>)	Endangered	Shallow areas in larger rivers and streams
	Snuffbox (<i>Epioblasma triquetra</i>)	Endangered	Small to medium-sized creeks and some larger rivers, in areas with a swift current
	Running buffalo clover (<i>Trifolium stoloniferum</i>)	Endangered	Disturbed bottomland meadows; disturbed sites that have shade during part of each day
Hancock	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Clubshell (<i>Pleurobema clava</i>)	Endangered	Found in coarse sand and gravel areas of runs and riffles within streams and small rivers
	Rayed bean (<i>Villosa fabalis</i>)	Endangered	Smaller, headwater creeks, but they are sometimes found in large rivers
Hardin	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests

	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Copperbelly water snake <i>(Nerodia erythrogaster neglecta)</i>	Threatened	Wooded and permanently wet areas such as oxbows, sloughs, brushy ditches and floodplain woods
	Eastern massasauga <i>(Sistrurus catenatus)</i>	Proposed as Threatened	Wetlands and adjacent uplands
	Clubshell <i>(Pleurobema clava)</i>	Endangered	Found in coarse sand and gravel areas of runs and riffles within streams and small rivers
	Rayed bean <i>(Villosa fabalis)</i>	Endangered	Smaller, headwater creeks, but they are sometimes found in large rivers
Harrison	Indiana bat <i>(Myotis sodalis)</i>	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
Henry	Indiana bat <i>(Myotis sodalis)</i>	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
Highland	Indiana bat <i>(Myotis sodalis)</i>	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
Hocking	Indiana bat <i>(Myotis sodalis)</i>	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Northern monkshood <i>(Aconitum noveboracense)</i>	Threatened	Cool, moist, shaded cliff faces or talus slopes in wooded ravines, near water seeps
	American burying beetle <i>(Nicrophorus americanus)</i>	Endangered	
	Running buffalo clover <i>(Trifolium stoloniferum)</i>	Endangered	Disturbed bottomland meadows; disturbed sites that have shade during part of each day
	Small whorled pogonia <i>(Isotria medeoloides)</i>	Threatened	Dry woodland; upland sites in mixed forests (second or third growth stage)
Holmes	Indiana bat <i>(Myotis sodalis)</i>	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests

	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Eastern prairie fringed orchid <i>(Platanthera leucophaea)</i>	Threatened	Mesic to wet prairies and meadows
Huron	Indiana bat <i>(Myotis sodalis)</i>	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Eastern massasauga <i>(Sistrurus catenatus)</i>	Proposed as Threatened	Wetlands and adjacent uplands
Jackson	Indiana bat <i>(Myotis sodalis)</i>	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Running buffalo clover <i>(Trifolium stoloniferum)</i>	Endangered	Disturbed bottomland meadows; disturbed sites that have shade during part of each day
Jefferson	Indiana bat <i>(Myotis sodalis)</i>	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
Knox	Indiana bat <i>(Myotis sodalis)</i>	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
Lake	Indiana bat <i>(Myotis sodalis)</i>	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Kirtland's warbler (<i>Dendroica kirtlandii</i>)	Endangered	Kirtland's warblers are known to migrate along the Lake Erie shoreline counties (Ashtabula, Cuyahoga, Erie, Lake, Lorain, Lucas, Ottawa, Sandusky counties) through Ohio in late April-May and late August-early October.
	Piping plover <i>(Charadrius melodus)</i>	Endangered	Beaches along shorelines of the Great Lakes
	Piping plover <i>(Charadrius melodus)</i>	Critical Habitat Designated	

	Red Knot (Rufa) <i>Calidris canutus rufa</i>	Threatened	Present in Ohio during spring and fall migration
	Snuffbox (<i>Epioblasma triquetra</i>)	Endangered	Small to medium-sized creeks and some larger rivers, in areas with a swift current
Lawrence	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Fanshell (<i>Cyprogenia stegaria</i>) (= <i>C. irrorata</i>)	Endangered	Found in areas of packed sand and gravel at locations in a good current
	Pink mucket pearlymussel (<i>Lampsilis abrupta</i>)	Endangered	The lower Ohio River and its larger tributaries
	Sheepnose (<i>Plethobasus cyphus</i>)	Endangered	Shallow areas in larger rivers and streams
	Snuffbox (<i>Epioblasma triquetra</i>)	Endangered	Small to medium-sized creeks and some larger rivers, in areas with a swift current
	Running buffalo clover (<i>Trifolium stoloniferum</i>)	Endangered	Disturbed bottomland meadows; disturbed sites that have shade during part of each day
Licking	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Eastern massasauga (<i>Sistrurus catenatus</i>)	Proposed as Threatened	Wetlands and adjacent uplands
Logan	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Eastern massasauga (<i>Sistrurus catenatus</i>)	Proposed as Threatened	Wetlands and adjacent uplands
	Rayed bean (<i>Villosa fabalis</i>)	Endangered	Smaller, headwater creeks, but they are sometimes found in large rivers
Lorain	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests

	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Kirtland's warbler (<i>Dendroica kirtlandii</i>)	Endangered	Kirtland's warblers are known to migrate along the Lake Erie shoreline counties (Ashtabula, Cuyahoga, Erie, Lake, Lorain, Lucas, Ottawa, Sandusky counties) through Ohio in late April-May and late August-early October.
	Piping plover (<i>Charadrius melodus</i>)	Endangered	Beaches along shorelines of the Great Lakes
	Red Knot (Rufa) <i>Calidris canutus rufa</i>	Threatened	Present in Ohio during spring and fall migration
Lucas	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Kirtland's warbler (<i>Dendroica kirtlandii</i>)	Endangered	Kirtland's warblers are known to migrate along the Lake Erie shoreline counties (Ashtabula, Cuyahoga, Erie, Lake, Lorain, Lucas, Ottawa, Sandusky counties) through Ohio in late April-May and late August-early October.
	Piping plover (<i>Charadrius melodus</i>)	Endangered	Beaches along shorelines of the Great Lakes
	Red Knot (Rufa) <i>Calidris canutus rufa</i>	Threatened	Present in Ohio during spring and fall migration
	Eastern massasauga (<i>Sistrurus catenatus</i>)	Proposed as Threatened	Wetlands and adjacent uplands
	Karner blue butterfly (<i>Lycaeides melissa samuelis</i>)	Endangered	Pine barrens and oak savannas on sandy soils and containing wild lupines (<i>Lupinus perennis</i>), the only known food plant of larvae.
	Rusty patched bumble bee <i>Bombus affinis</i>	Proposed as Endangered	Grasslands with flowering plants from April through October, underground and abandoned rodent cavities or clumps of grasses above ground as nesting sites, and undisturbed soil for hibernating queens to overwinter.
	Rayed bean (<i>Villosa fabalis</i>)	Endangered	Smaller, headwater creeks, but they are sometimes found in large rivers
Madison	Eastern prairie fringed orchid (<i>Platanthera leucophaea</i>)	Threatened	Mesic to wet prairies and meadows
	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Scioto madtom (<i>Noturus trautmani</i>)	Endangered	Stream riffles of moderate flow over sandy gravel bottom
	Clubshell (<i>Pleurobema clava</i>)	Endangered	Found in coarse sand and gravel areas of runs and riffles within streams and small rivers

	Northern riffleshell (<i>Epioblasma torulosa rangiana</i>)	Endangered	Large streams and small rivers in firm sand of riffle areas; also occurs in Lake Erie
	Rabbitsfoot <i>Quadrula cylindrica cylindrica</i>	Threatened	
	Rabbitsfoot <i>Quadrula cylindrica cylindrica</i>	Critical Habitat	Little Darby Creek
	Rayed bean (<i>Villosa fabalis</i>)	Endangered	Smaller, headwater creeks, but they are sometimes found in large rivers
	Snuffbox (<i>Epioblasma triquetra</i>)	Endangered	Small to medium-sized creeks and some larger rivers, in areas with a swift current
Mahoning	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Eastern massasauga (<i>Sistrurus catenatus</i>)	Proposed as Threatened	Wetlands and adjacent uplands
Marion	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Eastern massasauga (<i>Sistrurus catenatus</i>)	Proposed as Threatened	Wetlands and adjacent uplands
	Rayed bean (<i>Villosa fabalis</i>)	Endangered	Smaller, headwater creeks, but they are sometimes found in large rivers
	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
Medina	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
Meigs	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Fanshell (<i>Cyprogenia stegaria</i>) (= <i>C. irrorata</i>)	Endangered	Found in areas of packed sand and gravel at locations in a good current
	Pink mucket pearl mussel (<i>Lampsilis abrupta</i>)	Endangered	The lower Ohio River and its larger tributaries

	Sheepnose (<i>Plethobasus cyphus</i>)	Endangered	Shallow areas in larger rivers and streams
	Snuffbox (<i>Epioblasma triquetra</i>)	Endangered	Small to medium-sized creeks and some larger rivers, in areas with a swift current
Mercer	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
Miami	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Rayed bean (<i>Villosa fabalis</i>)	Endangered	Smaller, headwater creeks, but they are sometimes found in large rivers
	Snuffbox (<i>Epioblasma triquetra</i>)	Endangered	Small to medium-sized creeks and some larger rivers, in areas with a swift current
Monroe	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
Montgomery	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Eastern massasauga (<i>Sistrurus catenatus</i>)	Proposed as Threatened	Wetlands and adjacent uplands
	Rayed bean (<i>Villosa fabalis</i>)	Endangered	Smaller, headwater creeks, but they are sometimes found in large rivers
	Snuffbox (<i>Epioblasma triquetra</i>)	Endangered	Small to medium-sized creeks and some larger rivers, in areas with a swift current

Morgan	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Fanshell (<i>Cyprogenia stegaria</i>) (= <i>C. irrorata</i>)	Endangered	Found in areas of packed sand and gravel at locations in a good current
	Pink mucket pearlymussel (<i>Lampsilis abrupta</i>)	Endangered	The lower Ohio River and its larger tributaries
	Sheepnose (<i>Plethobasus cyphus</i>)	Endangered	Shallow areas in larger rivers and streams
	Snuffbox (<i>Epioblasma triquetra</i>)	Endangered	Small to medium-sized creeks and some larger rivers, in areas with a swift current
	American burying beetle (<i>Nicrophorus americanus</i>)	Endangered	
Morrow	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
Muskingum	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Fanshell (<i>Cyprogenia stegaria</i>) (= <i>C. irrorata</i>)	Endangered	Found in areas of packed sand and gravel at locations in a good current
	Rabbitsfoot <i>Quadrula cylindrica cylindrica</i>	Threatened	Muskingum River
	Sheepnose (<i>Plethobasus cyphus</i>)	Endangered	Shallow areas in larger rivers and streams
	Snuffbox (<i>Epioblasma triquetra</i>)	Endangered	Small to medium-sized creeks and some larger rivers, in areas with a swift current
Noble	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.

Ottawa	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods;
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Kirtland's warbler (<i>Dendroica kirtlandii</i>)	Endangered	Kirtland's warblers are known to migrate along the Lake Erie shoreline counties (Ashtabula, Cuyahoga, Erie, Lake, Lorain, Lucas, Ottawa, Sandusky counties) through Ohio in late April- May and late August-early October.
	Piping plover (<i>Charadrius melodus</i>)	Endangered	Beaches along shorelines of the Great Lakes
	Red Knot (Rufa) <i>Calidris canutus rufa</i>	Threatened	Present in Ohio during spring and fall migration
	Eastern massasauga (<i>Sistrurus catenatus</i>)	Proposed as Threatened	Wetlands and adjacent uplands
	Eastern prairie fringed orchid (<i>Platanthera leucophaea</i>)	Threatened	Mesic to wet prairies and meadows
	Lakeside daisy (<i>Hymenoxys herbacea</i>) (Formerly <i>H. acaulis</i>) var. <i>glabra</i>)	Threatened	Dry rocky prairies; limestone rock surfaces including outcrops and quarries
Paulding	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods;
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
Perry	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods;
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	American burying beetle (<i>Nicrophorus americanus</i>)	Endangered	
	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods;
Pickaway	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Scioto madtom (<i>Naturus trautmani</i>)	Endangered	Stream riffles of moderate flow over sandy gravel bottom
	Clubshell (<i>Pleurobema clava</i>)	Endangered	Found in coarse sand and gravel areas of runs and riffles within streams and small rivers
	Northern riffleshell (<i>Epioblasma torulosa rangiana</i>)	Endangered	Large streams and small rivers in firm sand of riffle areas; also occurs in Lake Erie

	Rabbitsfoot (<i>Quadrula cylindrica cylindrica</i>)	Threatened	
	Rayed bean (<i>Villosa fabalis</i>)	Endangered	Smaller, headwater creeks, but they are sometimes found in large rivers
	Snuffbox (<i>Epioblasma triquetra</i>)	Endangered	Small to medium-sized creeks and some larger rivers, in areas with a swift current
Pike	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Clubshell (<i>Pleurobema clava</i>)	Endangered	Found in coarse sand and gravel areas of runs and riffles within streams and small rivers
	Northern riffleshell (<i>Epioblasma torulosa rangiana</i>)	Endangered	Large streams and small rivers in firm sand of riffle areas; also occurs in Lake Erie
	Rayed bean (<i>Villosa fabalis</i>)	Endangered	Smaller, headwater creeks, but they are sometimes found in large rivers
Portage	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Eastern massasauga (<i>Sistrurus catenatus</i>)	Proposed as Threatened	Wetlands and adjacent uplands
	Mitchell's satyr butterfly (<i>Neonympha mitchellii mitchellii</i>)	Endangered	Fens; wetlands characterized by calcareous soils which are fed by carbonate-rich water from seeps and springs
	Northern monkshood (<i>Aconitum noveboracense</i>)	Threatened	Cool, moist, shaded cliff faces or talus slopes in wooded ravines, near water seeps
Preble	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Eastern massasauga (<i>Sistrurus catenatus</i>)	Proposed as Threatened	Wetlands and adjacent uplands
Putnam	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests


	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
Richland	Indiana bat <i>(Myotis sodalis)</i>	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Eastern massasauga <i>(Sistrurus catenatus)</i>	Proposed as Threatened	Wetlands and adjacent uplands
Ross	Indiana bat <i>(Myotis sodalis)</i>	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Clubshell <i>(Pleurobema clava)</i>	Endangered	Found in coarse sand and gravel areas of runs and riffles within streams and small rivers
	Northern riffleshell <i>(Epioblasma torulosa rangiana)</i>	Endangered	Large streams and small rivers in firm sand of riffle areas; also occurs in Lake Erie
	Rayed bean <i>(Villosa fabalis)</i>	Endangered	Smaller, headwater creeks, but they are sometimes found in large rivers
	Snuffbox <i>(Epioblasma triquetra)</i>	Endangered	Small to medium-sized creeks and some larger rivers, in areas with a swift current
	Running buffalo clover <i>(Trifolium stoloniferum)</i>	Endangered	Disturbed bottomland meadows; disturbed sites that have shade during part of each day
Sandusky	Indiana bat <i>(Myotis sodalis)</i>	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Kirtland's warbler (<i>Dendroica kirtlandii</i>)	Endangered	Kirtland's warblers are known to migrate along the Lake Erie shoreline counties (Ashtabula, Cuyahoga, Erie, Lake, Lorain, Lucas, Ottawa, Sandusky counties) through Ohio in late April-May and late August-early October.
	Piping plover <i>(Charadrius melodus)</i>	Endangered	Beaches along shorelines of the Great Lakes
	Red Knot (Rufa) <i>Calidris canutus rufa</i>	Threatened	Present in Ohio during spring and fall migration
	Eastern massasauga <i>(Sistrurus catenatus)</i>	Proposed as Threatened	Wetlands and adjacent uplands
	Eastern prairie fringed orchid <i>(Platanthera leucophaea)</i>	Threatened	Mesic to wet prairies and meadows

Scioto	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Clubshell (<i>Pleurobema clava</i>)	Endangered	Found in coarse sand and gravel areas of runs and riffles within streams and small rivers
	Fanshell (<i>Cyprogenia stegaria</i>) (= <i>C. irrorata</i>)	Endangered	Found in areas of packed sand and gravel at locations in a good current
	Northern riffleshell (<i>Epioblasma torulosa rangiana</i>)	Endangered	Large streams and small rivers in firm sand of riffle areas; also occurs in Lake Erie
	Pink mucket (<i>Lampsilis abrupta</i>)	Endangered	The lower Ohio River and its larger tributaries
	Rayed bean (<i>Villosa fabalis</i>)	Endangered	Smaller, headwater creeks, but they are sometimes found in large rivers
	Sheepnose (<i>Plethobasus cyphus</i>)	Endangered	Shallow areas in larger rivers and streams
	Snuffbox (<i>Epioblasma triquetra</i>)	Endangered	Small to medium-sized creeks and some larger rivers, in areas with a swift current
	Running buffalo clover (<i>Trifolium stoloniferum</i>)	Endangered	Disturbed bottomland meadows; disturbed sites that have shade during part of each day
	Small whorled pogonia (<i>Isotria medeoloides</i>)	Threatened	Dry woodland; upland sites in mixed forests (second or third growth stage)
	Virginia spiraea (<i>Spiraea virginiana</i>)	Threatened	Streambanks and floodplains
Seneca	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
Shelby	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Rayed bean (<i>Villosa fabalis</i>)	Endangered	Smaller, headwater creeks, but they are sometimes found in large rivers
Stark	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests

	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
Summit	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Northern monkshood (<i>Aconitum noveboracense</i>)	Threatened	Cool, moist, shaded cliff faces or talus slopes in wooded ravines, near water seeps
Trumbull	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Eastern massasauga (<i>Sistrurus catenatus</i>)	Proposed as Threatened	Wetlands and adjacent uplands
	Clubshell (<i>Pleurobema clava</i>)	Endangered	Found in coarse sand and gravel areas of runs and riffles within streams and small rivers
Tuscarawas	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
Union	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Scioto madtom (<i>Noturus trautmani</i>)	Endangered	Stream riffles of moderate flow over sandy gravel bottom
	Clubshell (<i>Pleurobema clava</i>)	Endangered	Found in coarse sand and gravel areas of runs and riffles within streams and small rivers
	Northern riffleshell (<i>Epioblasma torulosa rangiana</i>)	Endangered	Large streams and small rivers in firm sand of riffle areas; also occurs in Lake Erie
	Rabbitsfoot <i>Quadrula cylindrica cylindrica</i>	Threatened	
	Rabbitsfoot <i>Quadrula cylindrica cylindrica</i>	Critical Habitat	Little Darby Creek
	Rayed bean (<i>Villosa fabalis</i>)	Endangered	Smaller, headwater creeks, but they are sometimes found in large rivers

	Snuffbox (<i>Epioblasma triquetra</i>)	Endangered	Small to medium-sized creeks and some larger rivers, in areas with a swift current
Van Wert	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
Vinton	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	American burying beetle (<i>Nicrophorus americanus</i>)	Endangered	
	Running buffalo clover (<i>Trifolium stoloniferum</i>)	Endangered	Disturbed bottomland meadows; disturbed sites that have shade during part of each day
Warren	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Eastern massasauga (<i>Sistrurus catenatus</i>)	Proposed as Threatened	Wetlands and adjacent uplands
	Rayed bean (<i>Villosa fabalis</i>)	Endangered	Smaller, headwater creeks, but they are sometimes found in large rivers
	Running buffalo clover (<i>Trifolium stoloniferum</i>)	Endangered	Disturbed bottomland meadows; disturbed sites that have shade during part of each day
Washington	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Fanshell (<i>Cyprogenia stegaria</i>) (= <i>C. irrorata</i>)	Endangered	Found in areas of packed sand and gravel at locations in a good current
	Pink mucket pearl mussel (<i>Lampsilis abrupta</i>)	Endangered	The lower Ohio River and its larger tributaries
	Sheepnose (<i>Plethobasus cyphus</i>)	Endangered	Shallow areas in larger rivers and streams

	Snuffbox (<i>Epioblasma triquetra</i>)	Endangered	Small to medium-sized creeks and some larger rivers, in areas with a swift current
Wayne	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Eastern massasauga (<i>Sistrurus catenatus</i>)	Proposed as Threatened	Wetlands and adjacent uplands
	Eastern prairie fringed orchid (<i>Platanthera leucophaea</i>)	Threatened	Mesic to wet prairies and meadows
Williams	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Copperbelly water snake (<i>Nerodia erythrogaster neglecta</i>)	Threatened	Wooded and permanently wet areas such as oxbows, sloughs, brushy ditches and floodplain woods
	Clubshell (<i>Pleurobema clava</i>)	Endangered	Found in coarse sand and gravel areas of runs and riffles within streams and small rivers
	Northern riffleshell (<i>Epioblasma torulosa rangiana</i>)	Endangered	Large streams and small rivers in firm sand of riffle areas; also occurs in Lake Erie
	Rabbitsfoot <i>Quadrula cylindrica cylindrica</i>	Threatened	
	Rabbitsfoot <i>Quadrula cylindrica cylindrica</i>	Critical Habitat	Fish Creek
	Rayed bean (<i>Villosa fabalis</i>)	Endangered	Smaller, headwater creeks, but they are sometimes found in large rivers
	White cat's paw pearlymussel (<i>Epioblasma obliquata perobliqua</i>)	Endangered	Firm sand or gravel riffles in small streams and medium to large rivers
Wood	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
Wyandot	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.

	Eastern massasauga (<i>Sistrurus catenatus</i>)	Proposed as Threatened	Wetlands and adjacent uplands
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ATTACHMENT C

ODNR STATE LISTED WILDLIFE SPECIES FOR HAMILTON COUNTY

HAMILTON COUNTY

State Status	Federal Status	County	Category	Species	CommonName	Sensitive Species	Most Recent Record	FWS
Endangered		Hamilton	Amphibian - Salamander	<i>Cryptobranchus alleganiensis alleganiensis</i>	Eastern Hellbender	Yes	1961	
Endangered		Hamilton	Amphibian - Salamander	<i>Eurycea lucifuga</i>	Cave Salamander	No	2013	
Endangered		Hamilton	Fish	<i>Lepisosteus platostomus</i>	Shorfnose Gar	No	2009	
Endangered		Hamilton	Fish	<i>Macrhybopsis hyostoma</i>	Shoal Chub	No	2012	
Endangered		Hamilton	Fish	<i>Noturus stigmosus</i>	Northern Madtom	No	2008	
Endangered		Hamilton	Insect - butterfly	<i>Lycaena helloides</i>	Purplish Copper	No	1917	
Endangered		Hamilton	Insect - butterfly	<i>Speyeria idalia</i>	Regal Fritillary	No	1946	
Endangered		Hamilton	Insect - odonate	<i>Gomphus externus</i>	Plains Clubtail	No	1995	
Endangered		Hamilton	Insect - odonate	<i>Nannothemis bella</i>	Elfin Skimmer	No	2002	
Endangered	Endangered	Hamilton	Invert. - fw bivalve	<i>Cyprogenia stegaria</i>	Fanshell	No	1887	
Endangered		Hamilton	Invert. - fw bivalve	<i>Ellipsaria lineolata</i>	Butterfly	No	1987	
Endangered		Hamilton	Invert. - fw bivalve	<i>Elliptio crassidens crassidens</i>	Elephant-ear	No	1987	
Endangered	Endangered	Hamilton	Invert. - fw bivalve	<i>Epioblasma obliquata obliquata</i>	Purple Cat's Paw	No	1850	
Endangered	Endangered	Hamilton	Invert. - fw bivalve	<i>Epioblasma torulosa rangiana</i>	Northern Riffleshell	No	1850	
Endangered	Endangered	Hamilton	Invert. - fw bivalve	<i>Epioblasma triquetra</i>	Snuffbox	No	1850	
Endangered		Hamilton	Invert. - fw bivalve	<i>Fusconaia ebena</i>	Ebonyshell	No	1997	
Endangered		Hamilton	Invert. - fw bivalve	<i>Fusconaia maculata maculata</i>	Long-solid	No	1997	
Endangered		Hamilton	Invert. - fw bivalve	<i>Lampsilis ovata</i>	Sharp-ridged Pocketbook	No	1850	
Endangered	Endangered	Hamilton	Invert. - fw bivalve	<i>Lampsilis teres</i>	Yellow Sandshell	No	1943	
Endangered		Hamilton	Invert. - fw bivalve	<i>Lampsilis abrupta</i>	Pink Mucket	No		
Endangered	Endangered	Hamilton	Invert. - fw bivalve	<i>Megalania nervosa</i>	Washboard	No	2013	
Endangered	Endangered	Hamilton	Invert. - fw bivalve	<i>Pleurobema cyphus</i>	Sheepnose	No	1997	
Endangered	Endangered	Hamilton	Invert. - fw bivalve	<i>Pleurobema clava</i>	Clubshell	No	1850	
Endangered		Hamilton	Invert. - fw bivalve	<i>Pleurobema cordatum</i>	Ohio Pigtoe	No	1997	
Endangered		Hamilton	Invert. - fw bivalve	<i>Pleurobema rubrum</i>	Pyramid Pigtoe	No	1879	
Endangered	Threatened	Hamilton	Invert. - fw bivalve	<i>Quadrula cylindrica cylindrica</i>	Rabbitsfoot	No	1850	
Endangered		Hamilton	Invert. - fw bivalve	<i>Quadrula metanervia</i>	Monkeyface	No	1997	
Endangered		Hamilton	Invert. - fw bivalve	<i>Quadrula nodulata</i>	Wartyback	No	2013	
Endangered	Endangered	Hamilton	Invert. - fw bivalve	<i>Villosa fabalis</i>	Rayed Bean	No		
Endangered	Endangered	Hamilton	Mammal	<i>Myotis sodalis</i>	Indiana Myotis	Yes		
Threatened		Hamilton	Fish	<i>Cyprinella elongatus</i>	Blue Sucker	No	2010	
Threatened		Hamilton	Fish	<i>Notropis boops</i>	Bigeye Shiner	No	2012	
Threatened		Hamilton	Fish	<i>Noturus eleutherus</i>	Mountain Madtom	No	2013	
Threatened		Hamilton	Fish	<i>Percina copelandi</i>	Channel Darter	No	1996	
Threatened		Hamilton	Fish	<i>Percina shumardi</i>	River Darter	No	2009	
Threatened		Hamilton	Fish	<i>Polyodon spathula</i>	Paddlefish	No	1992	
Threatened		Hamilton	Invert. - decapod	<i>Orconectes (Rhoadesius) sloanii</i>	Sloan's Crayfish	No	1995	
Threatened		Hamilton	Invert. - fw bivalve	<i>Ligumia recta</i>	Black Sandshell	No	2013	
Threatened		Hamilton	Invert. - fw bivalve	<i>Obliquaria reflexa</i>	Threehorn Wartyback	No	2013	
Threatened		Hamilton	Invert. - fw bivalve	<i>Truncilla donaciformis</i>	Fawnsfoot	No	2012	
Threatened		Hamilton	Invert. - fw bivalve	<i>Unionensis tentalasmus</i>	Pandhorn	No	1850	
Threatened		Hamilton	Mammal	<i>Reithrodontomys humilis</i>	Eastern Harvest Mouse	No	1945	
Threatened		Hamilton	Reptile - Snake	<i>Colaptes kirtlandii</i>	Kirtland's Snake	No	1937	
Species of Concern		Hamilton	Amphibian - Frog / Toad	<i>Acris crepitans crepitans</i>	Eastern Cricket Frog	No	2011	
Species of Concern		Hamilton	Bird	<i>Dendroica cerulea</i>	Cerulean Warbler	No	2006	
Species of Concern		Hamilton	Fish	<i>Ammocrypta pellucida</i>	Eastern Sand Darter	No	2013	
Species of Concern		Hamilton	Fish	<i>Esox masquinongy</i>	Muskellunge	No	2009	
Species of Concern		Hamilton	Fish	<i>Ictalurus furcatus</i>	Blue Catfish	No	2010	
Species of Concern		Hamilton	Fish	<i>Moxostoma carinatum</i>	River Redhorse	No	2010	
Species of Concern		Hamilton	Invert. - fw bivalve	<i>Alasmidonta marginata</i>	Elktoe	No	2007	
Species of Concern		Hamilton	Invert. - fw bivalve	<i>Cyclonaias tuberculata</i>	Purple Wartyback	No	1987	
Species of Concern		Hamilton	Invert. - fw bivalve	<i>Lampsilis fasciola</i>	Wavy-rayed Lampmussel	No	1850	
Species of Concern		Hamilton	Invert. - fw bivalve	<i>Lasmigona compressa</i>	Creek Heelsplitter	No	1850	
Species of Concern		Hamilton	Invert. - fw bivalve	<i>Pleurobema sintoxia</i>	Round Pigtoe	No	1987	
Species of Concern		Hamilton	Invert. - fw bivalve	<i>Ptychobranchius fasciolaris</i>	Kidneyshell	No	1850	
Species of Concern		Hamilton	Mammal	<i>Truncilla truncata</i>	Deertoe	No	2012	
Species of Concern		Hamilton	Mammal	<i>Eptesicus fuscus</i>	Big Brown Bat	No	2011	
Species of Concern		Hamilton	Mammal	<i>Lasiurus noctivagus</i>	Silver-haired Bat	No	1984	
Species of Concern		Hamilton	Mammal	<i>Lasiurus borealis</i>	Red Bat	No	2010	
Species of Concern		Hamilton	Mammal	<i>Lasiurus cinereus</i>	Hoary Bat	No	2010	
Species of Concern		Hamilton	Mammal	<i>Microtus ochrogaster</i>	Prairie Vole	No	1974	
Species of Concern		Hamilton	Mammal	<i>Microtus pinetorum</i>	Woodland Vole	No	1974	
Species of Concern	Threatened	Hamilton	Mammal	<i>Myotis lucifugus</i>	Little Brown Bat	No	2010	
Species of Concern		Hamilton	Mammal	<i>Myotis septentrionalis</i>	Northern Long-eared Bat	No	2009	
Species of Concern		Hamilton	Mammal	<i>Perimyotis subflavus</i>	Titi-colored Bat	No	2011	
Species of Concern		Hamilton	Mammal	<i>Peromyscus maniculatus</i>	Deer Mouse	No	2013	
Species of Concern		Hamilton	Mammal	<i>Synaptomys cooperi</i>	Southern Bog Lemming	No	1958	
Species of Concern		Hamilton	Mammal	<i>Taxidea taxus</i>	Badger	No	2006	
Species of Concern		Hamilton	Reptile - Snake	<i>Opheodrys aestivus aestivus</i>	Northern Rough Greensnake	No	1973	
Special Interest		Hamilton	Bird	<i>Regulus satrapa</i>	Golden-crowned Kinglet	No	2013	
Special Interest		Hamilton	Insect - moth	<i>Catocala maestosa</i>		No	1924	
Extirpated		Hamilton	Invert. - fw bivalve	<i>Actinonaias ligamentina ligamentina</i>	Mucket	No	1987	
Extirpated		Hamilton	Invert. - fw bivalve	<i>Cumbeberlandia monodonta</i>	Spectaclecase	No	1909	
Extirpated		Hamilton	Invert. - fw bivalve	<i>Leptodea leptodon</i>	Cracking Pearly Mussel	No	1850	
Extirpated		Hamilton	Invert. - fw bivalve	<i>Obovaria olivaria</i>	Scaleshell	No	1850	
Extirpated		Hamilton	Invert. - fw bivalve	<i>Obovaria retusa</i>	Hickorynut	No	1965	
Extirpated		Hamilton	Invert. - fw bivalve	<i>Pleurobema cicatricosus</i>	Ring Pink	No	1987	
Extirpated		Hamilton	Invert. - fw bivalve	<i>Pleurobema cooperianus</i>	White Wartyback	No	1850	
Extirpated		Hamilton	Invert. - fw bivalve	<i>Pleurobema plenum</i>	Orange-footed Pearly Mussel	No	1876	
Extirpated		Hamilton	Invert. - fw bivalve	<i>Quadrula fragosa</i>	Rough Pigtoe	No	1885	
Extirpated		Hamilton	Invert. - fw bivalve		Winged Mapleleaf	No	1850	
Extinct		Hamilton	Invert. - fw bivalve	<i>Epioblasma flexuosa</i>	Leafshell	No	1850	
Extinct		Hamilton	Invert. - fw bivalve	<i>Epioblasma lewisi</i>	Forkshell	No	1850	
Extinct		Hamilton	Invert. - fw bivalve	<i>Epioblasma personata</i>	Round Snuffbox	No	1850	
Extinct		Hamilton	Invert. - fw bivalve	<i>Epioblasma philipsi</i>	Cincinnati Riffleshell	No	1850	
Extinct		Hamilton	Invert. - fw bivalve	<i>Epioblasma torulosa torulosa</i>	Tuberled Blossom	No	1850	

ATTACHMENT D

ODNR RARE NATIVE OHIO PLANTS STATUS LIST

Ohio Department of Natural Resources
RARE NATIVE OHIO PLANTS
Status List

The attached list of Ohio endangered, threatened, potentially threatened, and presumed extirpated native plant taxa was determined by the Department of Natural Resources, Division of Natural Areas and Preserves with the advice and guidance of the Ohio Rare Plants Advisory Committee pursuant to Ohio Revised Code Chapter 1518. This list replaces the 2012-13 status list.

The list is divided into six phylogenetic groups: Lichens, Bryophytes, Pteridophytes, Gymnosperms, Dicotyledons, and Monocotyledons. Within each group, families and their associated taxa are arranged in alphabetic order. Taxonomy and nomenclature of vascular plants generally follow The Flora of North America (1993+) and/or Gleason and Cronquist (1991). Vascular taxa not included in either manual are followed by a specific reference. Taxonomy and nomenclature of the non-vascular plants follow Anderson, Crum and Buck (1990) and Anderson (1990) for bryophytes and Brodo, Sharnoff and Sharnoff (2001) for lichens. Valuable taxonomic references specific to Ohio include Snider and Andreas (1996) for bryophytes, Showman and Flenniken (2004) for lichens, and Cooperrider, Cusick and Kartesz (2001) for vascular plants. The columns marked OH and US indicate status of the taxon as assigned by the Division of Natural Areas and Preserves (Ohio Administrative Rules 1501:18-1-01 through 1501:18-2-05) and by the U.S. Fish & Wildlife Service.

The current list contains 92 presumed extirpated, 254 endangered, 157 threatened, and 111 potentially threatened taxa, plus 4 plant taxa with no assigned status. Only data from January 1, 1994 through December 31, 2013 were considered in assigning endangerment status based upon information in the Ohio Natural Heritage Database.

The first status list, issued in 1980, was largely based on preliminary lists of rare plant species compiled in the 1970s for the Ohio Biological Survey. Since 1980, the status lists have been updated biennially. This list became effective on **December 15, 2014** and will be revised again in **2016**.

Information on these 614 plants is contained in the Ohio Natural Heritage Database and is generally accessible for research or environmental review through the Ohio Natural Heritage Database Program. A data request form may be obtained by contacting the Database Program within the Division of Wildlife or visiting its web site. Upon request, the Division will also provide an alphabetic status list of rare Ohio plants.

OHIO STATUS DESIGNATION CRITERIA

E Endangered Species

A native Ohio plant species may be designated endangered if, based on its known status in Ohio, one or more of the following criteria apply:

1. The species is a federal endangered species extant in Ohio.
2. The natural populations of the species in Ohio are limited to three or fewer occurrences.
3. The distribution of the natural populations of the species in Ohio is limited to a geographic area delineated by three or fewer U.S. Geological Survey 7.5 minute quadrangle maps.
4. The number of plants in all the natural populations of the species in Ohio is limited to one hundred or fewer individual, physically unconnected plants.

T Threatened Species

A native Ohio plant species may be designated threatened if, based on its known status in Ohio, one or more of the following criteria apply:

1. The species is a federal threatened species extant in Ohio but not on the state endangered species list.
2. The natural populations of the species in Ohio are limited to no less than four or more than 10 occurrences.
3. The distribution of the natural populations of the species in Ohio is limited to a geographic area delineated by no less than four or more than seven U.S. Geological Survey 7.5 minute quadrangle maps.

X Presumed Extirpated Species

A native Ohio plant species may be designated presumed extirpated when no natural populations of the species have been documented since 1994.

P Potentially Threatened Species

A native Ohio plant species may be designated potentially threatened if one or more of the following criteria apply:

1. The species is extant in Ohio and does not qualify as a state endangered or threatened species, but it is a proposed federal endangered or threatened species or a species listed in the *Federal Register* as under review for such proposal.
2. The natural populations of the species are imperiled to the extent that the species could conceivably become a threatened species in Ohio within the foreseeable future.
3. The natural populations of the species, even though they are not threatened in Ohio at the time of designation, are believed to be declining in abundance or vitality at a significant rate throughout all or large portions of the state.

A Added Species

A native Ohio plant species recently added to the rare plant inventory and sufficient information has not yet been obtained to determine the Ohio endangerment status.

FEDERAL LISTED OHIO PLANT SPECIES

Ohio-selected scientific and common names are listed first. Federal-selected names are shown in parentheses if they differ from the names on the Ohio list.

E = Federal endangered

T = Federal threatened

Note: Lists and information about federal listed, proposed and candidate species can be obtained from the U.S. Fish & Wildlife Service web site at <http://endangered.fws.gov/wildlife.html>. At this time, there are no Ohio plants designated as either proposed for listing or on the federal candidate species list.

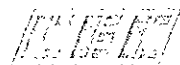
US	OH		
<u>Status</u>	<u>Status</u>	<u>Scientific Name</u>	<u>Common Name(s)</u>
T	E	Aconitum noveboracense	Northern Monkshood (Northern Wild Monkshood)
T	E	Tetraneuris herbacea	Lakeside Daisy
T	E	Isotria medeoloides	Small Whorled Pogonia
T	T	Platanthera leucophaea	Prairie Fringed Orchid (Eastern Prairie Fringed Orchid)
T	E	Spiraea virginiana	Appalachian Spiraea (Virginia Spiraea)
E	E	Trifolium stoloniferum	Running Buffalo Clover

CITATIONS

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- Radford, A.E., H.E. Ahles and C.R. Bell. 1968. *Manual of the vascular flora of the Carolinas*. The University of North Carolina Press, Chapel Hill, NC. 1,183 pp.
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- Showman, R.E. and D.G. Flenniken. 2004. *The Macrolichens of Ohio*. Ohio Biological Survey Bulletin New Series Vol. 14 No. 3. iv + 279 pp.
- Snider, J.A. and B.K. Andreas. 1996. *A Catalog and Atlas of the Mosses of Ohio*. Ohio Biological Survey, Misc. Contribution No. 2 iv + 105 pp.
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ATTACHMENT E

RUNNING BUFFALO CLOVER REPORT



Civil & Environmental Consultants, Inc.

September 23, 2016

Mr. Steve Lane, CPESC, AICP, PMP
Senior Environmental Scientist
Duke Energy Corporation
139 East Fourth Street, Room EM740
Cincinnati, OH 45202

Dear Mr. Lane:

Subject: Running Buffalo Clover Survey Report
Line D000B Pipeline Replacement Project
Cincinnati, Hamilton County, Ohio
CEC Project 153-230

Civil & Environmental Consultants, Inc. (CEC) is pleased to present the attached running buffalo clover (RBC) survey report for the Duke Energy Corporation (Duke Energy) Line D000B Pipeline Replacement Project, located in Cincinnati, Hamilton County, Ohio. CEC's services were provided in accordance with the Master Consulting Services Agreement, effective June 1, 2015, between Duke Energy and CEC, and our revised proposal dated February 1, 2016. We appreciate the opportunity to be of service to Duke Energy on this project. Please call us if you have any questions regarding the attached report.

Sincerely,

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

Dustin M. Giesler
Staff Scientist

Joseph A. Van Skaik
Project Manager

Attachment: Running Buffalo Clover Survey Report

RUNNING BUFFALO CLOVER SURVEY REPORT
LINE D000B PIPELINE REPLACEMENT PROJECT
CINCINNATI, HAMILTON COUNTY, OHIO

PREPARED FOR:

DUKE ENERGY CORPORATION
139 EAST FOURTH STREET
CINCINNATI, OHIO 45202

PREPARED BY:

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
CINCINNATI, OHIO

CEC Project 153-230

September 23, 2016



Civil & Environmental Consultants, Inc.

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EXECUTIVE SUMMARY

On May 16, 18, and 19, 2016, Civil & Environmental Consultants, Inc. conducted a running buffalo clover (RBC) (*Trifolium stoloniferum*; federally-listed endangered) survey within the Duke Energy Corporation's (Duke Energy) Line D000B Pipeline Replacement Project study corridor (Project area), located in Cincinnati, Hamilton County, Ohio. The total potential RBC habitat that was surveyed was approximately 5.06 acres or about 6 percent of the total Project area. The remaining areas within the Project study corridor do not provide suitable habitat conditions for the RBC based on one or more of the following habitat considerations: extent of disturbance, solar exposure, soil saturation, and/or a dense understory. No RBC individuals or populations were observed during the survey. The survey was conducted following standard methods for endangered plant surveys, as approved by the United States Fish and Wildlife Service (USFWS), which included species-specific surveys within potentially suitable habitat during the timeframe when local RBC populations were within a vegetative state that allowed for positive identification of this species. Therefore, it is CEC's professional opinion that the proposed project is not likely to adversely affect the RBC.

1.0 INTRODUCTION

This report presents the findings of a running buffalo clover (RBC) (*Trifolium stoloniferum*; federally-listed endangered) survey conducted by Civil & Environmental Consultants, Inc. (CEC) for the Duke Energy Corporation (Duke Energy) within the Line D000B Pipeline Replacement study corridor, located in Cincinnati's East End, Hamilton County, Ohio. CEC understands that Duke is proposing to replace approximately 3.45 miles (18,200 feet) of a single existing 20- and 24-inch spiral welded bare steel high pressure natural gas pipeline with a new 24-inch corrosion protected steel pipe. The variable width Project study corridor, averaging 200-foot wide, is approximately 3.45 miles in length and totals approximately 84.2 acres and was extended beyond the pipeline easement and associated workspace. The pipeline easement is at maximum 50 feet in width, with another 20 to 50 feet of additional temporary workspace where available. Approximately 2.47 miles or 13,303 feet of the replacement pipeline is proposed to be collocated within the existing pipeline ROW, while the remaining 0.98 mile (5,162 feet) of replacement pipeline will be located within new pipeline ROW. Approximately 96 percent (4,939 feet) of the new pipeline ROW will be located in areas previously disturbed, including Kellogg Avenue, unnamed private roads, and several businesses. The existing pipeline is proposed to be abandoned in-place.

CEC conducted a RBC species habitat assessment, followed by a presence-absence survey within the Project study corridor on May 16, 18, and 19, 2016. The habitat survey revealed approximately 5.06 acres or about 6 percent of the Project study corridor met the habitat considerations as potential RBC habitat (Figures 4-19). CEC subsequently conducted a RBC survey on the potential habitat that was identified in the Project area. The survey was conducted following standard methods and guidelines for endangered plant surveys, as approved by the USFWS, which included a species-specific survey within potentially suitable habitat during the flowering period from late spring to early summer, as to allow for positive identification of the species. Detailed information on RBC life history and distribution, survey methods employed, and survey results are included in this report.

2.0 BACKGROUND

The Project study corridor is located entirely within Cincinnati's East End neighborhood. The Project area is bound by Duke Energy's East End natural gas distribution center to the north, the Little Miami River to the south, State Route 52 to the east, and the Ohio River to the west. Topography within the Project area consists of level to gently sloping terrain, with a steeply sloped embankment at the southern extent of the Project area. Elevations within the Project study corridor are mapped to range from approximately 470 feet to 515 feet above mean sea level (AMSL). Hydrologic features within the Project area include six wetlands (Figures 3-19). Drainage within the Project area is to the Little Miami and Ohio Rivers. The full extent of the Project study corridor is located within the Federal Emergency Management Agency (FEMA) 100-year floodplain.

The general types of habitats where the RBC survey was conducted included mowed park habitat with scattered overstory trees, periodically disturbed trail habitat that is located on an embankment that formerly functioned as a railroad corridor, mixed early successional/right-of-way (ROW) habitat, and second growth floodplain forest habitat (Figures 4-19). Representative photographs of the habitats are provided in Appendix A. The RBC survey was conducted within the Project area based on the presence of potentially suitable RBC survey habitat and the potential for this species to occur within Hamilton, Ohio (Appendix B).

3.0 RUNNING BUFFALO NATURAL HISTORY

3.1 REASON FOR LISTING

RBC was listed by the USFWS as federally endangered on July 6, 1987 (50 FR 21478-21480) (USFWS 2007). Specific threats identified by the RBC Recovery Team in 1995 were: 1) any irreversible, catastrophic disturbance, such as road construction that completely destroys the habitat and/or kills all plants and seeds within the path of the disturbance; 2) the closing of forest canopies through succession to the point of severe shading, leading to reduced flower and fruit production; 3) the elimination of bison leading to reduced seed dispersal and release of competing vegetation; 4) low population size and associated fragility and susceptibility to catastrophe (including genetic diversity concerns); 5) excessive herbivory; 6) viral and fungal diseases; 7) reduction in pollinators; and 8) competition from non-native, invasive plant species (USFWS 2007).

3.2 DESCRIPTION

RBC is a member of the Fabaceae (pea) family that produces erect flowering stems, 10 to 30 centimeters (cm) tall, that send out long basal runners (stolons) (USFWS 2007). The basal runners root at the nodes and produce leaves that have 1 to 2 cm long ovate-lanceolate stipules, whose tips gradually narrow to a distinctive point (USFWS 2007). The plant produces 9 to 12 millimeter (mm) long round white flowers from mid-April to June, with fruiting occurring from May to July. A single plant is defined as an individual rooted crown (USFWS 2007). These crowns may occur singly or be attached to other rooted crowns by stolons. Brooks (1983) provides a more comprehensive description of this species.

3.3 DISTRIBUTION

Historically, RBC was found from the central plains to the Appalachian Mountains. The species was once considered extinct until a single population was rediscovered in West Virginia in 1983 (Brooks 1983). Since then, populations have been discovered in Indiana, Kentucky, Missouri,

and Ohio. Current populations are divided into three regions based on proximity to each other and overall habitat similarities. These regions are Appalachian (West Virginia and southeastern Ohio), Bluegrass (southwestern Ohio, central Kentucky, and southeast Indiana), and Ozark (Missouri) (USFWS 2007). A total of 108 populations of RBC are currently known from Ohio, Indiana, Kentucky, Missouri, and West Virginia (NatureServe 2015; USFWS 2007, 2008).

3.4 HABITAT

Habitat for RBC typically includes locations with partial or filtered sunlight and with moist, fertile soils that have been exposed to long-term moderate patterns of disturbance (CPC 2016). It is thought that large herbivores like bison and cattle provided the necessary scarification of the soil for plants to germinate. Populations of this species are often found in the ecotone between forest and tallgrass prairie habitats (CPC 2016).

Additionally, others describe the habitat of this species as including mesophytic woodlands (Isely 1998), moist, well-drained disturbed woods associated with streams (Gleason and Cronquist 1991), and open woods, borders, and forest clearings (Cusick 1989). It has been reported from a variety of habitats, including mesic woodlands, savannahs, floodplains, stream banks, sandbars (especially where old trails cross or parallel intermittent streams), grazed woodlots, forested lawn areas or trails that are infrequently mowed (e.g. in cemeteries, parks, and residential lawns), old logging roads, jeep trails, skidder trails, mowed wildlife openings within mature forest, and steep ravines (USFWS 2007). No critical habitat has been designated for this species (NatureServe 2015).

3.5 RECENT HISTORY OF SPECIES IN OHIO

RBC was rediscovered in Ohio in 1988 and is listed as endangered by the state of Ohio. According to the USFWS (2007), 18 extant populations and eight extirpated populations were known from Ohio, as of 2005. Populations have been primarily found in mesic forest and lawn habitats in Hamilton, Clermont, Brown, and Lawrence counties. Most of the known populations are reportedly located on county park lands and have been managed as to protect and encourage

RBC. The first population on Federal land in Ohio was located in 2005 on Wayne National Forest (USFWS 2007).

4.0 SURVEY METHODOLOGY

4.1 LITERATURE REVIEW

A literature review of pertinent articles relating to the RBC was conducted as part of the background data acquisition activities for this study. The USFWS County Distribution List of Federally-Listed Threatened, Endangered, Proposed, and Candidate Species in Ohio was reviewed during the initial stages of this project to obtain information concerning known threatened and endangered species populations within the area (USFWS 2016). The USFWS Hamilton County, Ohio listing reported that the Project area was within the known range of the RBC, though site specific species occurrences were not known. Several additional articles from the scientific literature were obtained and reviewed for additional information of use to the field study program (as cited in the references section). This information collected prior to conducting the field study was useful in supplementing the information concerning the preferred habitat conditions of known RBC populations in the region.

4.2 PRE-SURVEY KNOWN POPULATION FIELD VERIFICATION

In addition to the literature review, a pre-survey verification of a known RBC population was conducted at the Dinsmore Woods State Nature Preserve in Boone County, Kentucky. The purpose of this verification was to determine the precise flowering period and “phenophase” of the known population. This would allow the field survey to be conducted knowing the growth condition of the species to assist in better observation and species presence determinations. During the pre-survey site verification, photographs of the condition of the existing known population were made and the specific plant growth stage was noted. In addition, attention was directed toward observation of plant associations, soils, amount of vegetative shading, duration of disturbance, and amount of disturbance that were habitat characteristics of the known RBC population. Appendix A-1 contains representative photographs of the RBC population that was observed in Dinsmore Woods State Nature Preserve, as photographed by CEC on May 6, 2016.

4.3 POTENTIAL RBC HABITAT AND PRESENCE-ABSENCE SURVEY

On May 16, 18, and 19, 2016, CEC biologist and USFWS approved RBC surveyor Joey Van Skaik conducted an RBC habitat survey, followed by an RBC presence-absence survey of the Project area. This two-phased approach involved an initial ground truthing effort to identify areas within the Project study corridor that contained suitable habitat for the RBC.. The areas that were identified as potential RBC habitat were subsequently and systematically searched to determine the presence or absence of the species.

The presence-absence survey involved walking transects spaced approximately 10 to 15 feet apart, depending on the density of vegetation in the understory. Observed species of clover (*Trifolium* spp.), or with clover-like leaves, were visually reviewed when encountered. A Trimble GeoXT Global Positioning System (GPS) was used to guide the field survey relative to the limits of the Project study corridor and to establish approximate coordinates of photograph points, voucher specimen locations, and other features of interest. CEC surveyed maintained, early successional park habitat with scattered overstory trees, periodically disturbed trail habitat that is located on an embankment that formerly functioned as a railroad corridor, mixed early successional/right-of-way (ROW) habitat, and second growth floodplain forest habitat within the Project area.

Dominant plant species in the overstory, understory, and herbaceous ground cover were documented. See Appendix A-2 for representative photographs of the areas that were surveyed for RBC within the Project study corridor. It is worth noting that Appendix A-2 also includes site reconnaissance photographs that were taken as part of the wetland and waterbody delineation effort. Areas that lacked potentially suitable habitat and/or contained dense vegetation were not included in the transect survey.

5.0 RESULTS

The RBC survey results for the Project study corridor and reference population location are presented below on Table 1.

TABLE 1 RUNNING BUFFALO CLOVER SURVEY RESULTS						
Survey Date	Site Name	Latitude	Longitude	Site Location	Habitat Type	RBC Present/ Absent
May 5, 2016	Reference Population	39.000841	-84.814890	Dinsmore Woods State Nature Preserve Boone County, Kentucky	Walking trail leading to ridge top and adjacent cemetery. Site receives periodic disturbance and filtered sunlight.	Present
May 16 & 18, 2016	1	39.080896	-84.427648	Near Four Seasons Marina and the confluence of the Little Miami and Ohio Rivers	Bottomland hardwood forest bisected by a pipeline right-of-way/early successional habitat. Site receives periodic disturbance and filtered sunlight.	Absent
May 18, 2016	2	39.082402	-84.427663	Near Four Seasons Marina and the confluence of the Little Miami and Ohio Rivers	Trail or two track habitat that is located on an embankment that formerly functioned as a railroad corridor. Site receives periodic disturbance and filtered sunlight.	Absent
May 19, 2016	3A 3B 3C 3D	39.115040 39.115381 39.115666 39.115969	-84.443193 -84.443573 -84.443945 -84.444430	Adjacent to Turkey Ridge Park, the Ohio River Trail, and Humbert Avenue	Mowed park habitat with scattered overstory trees. Site receives periodic disturbance and filtered sunlight.	Absent
May 19, 2016	4	39.118429	-84.448547	Located at Schmidt Recreation Complex and adjacent to the Ohio River Trail	Mowed park habitat with scattered overstory trees. Site receives periodic disturbance and filtered sunlight.	Absent

The observation and photo documentation of the known RBC population at the Dinsmore Woods State Nature Preserve in Boone County, Kentucky assisted significantly in identifying the stage of growth and flowering of the species in the area.

Although potentially suitable habitat for the RBC was present within the Project study corridor, no RBC individuals or populations were identified during the survey conducted by CEC on May 16, 18, and 19, 2016. Four RBC look-alikes were observed during the survey, including three plants from the leguminous pea family and one plant from the wood-sorrel family. These four species of RBC look-alikes include white clover (*Trifolium repens*), red clover (*Trifolium pratense*), low hop clover/field clover (*Trifolium campestre*), and common yellow oxalis (*Oxalis stricta*), respectively.

Site 1 is a bottomland hardwood forest bisected by an existing pipeline right-of-way that is maintained in an early successional habitat state. The site receives periodic disturbance as evidenced by the occasional mowing along the ROW and flood events from the Ohio and Little Miami Rivers. The site receives filtered solar exposure and is located on rich soil. Representative photographs of this habitat type are included in Appendix A-2.

The forested vegetation community is dominated by silver maple (*Acer saccharinum*), cottonwood (*Populus deltoids*), box elder (*Acer negundo*), and American elm (*Ulmus americana*), while the herbaceous plant community included creeping jenny (*Lysimachia nummularia*), false nettle (*Boehmeria cylindrica*), white clover (*Trifolium repens*), red clover (*Trifolium pratense*), giant ironweed (*Vernonia gigantea*), narrowleaf plantain (*Plantago lanceolata*), common yellow oxalis (*Oxalis stricta*), stickywilly (*Galium aparine*), hog peanut (*Amphicarpa bracteata*), wingstem (*Verbesina alternifolia*), violets (*Viola* spp.), poison ivy (*Toxicodendron radicans*), Canadian honeysuckle (*Cryptotaenia canadensis*), sedges (*Carex* spp.) and stinging nettle (*Urtica dioica*).

Site 2 is a trail or two-track that is located on an embankment that formerly functioned as a railroad corridor. The site receives occasional to periodic disturbance and filtered solar exposure. Representative photographs of this habitat type are included in Appendix A-2.

Common herbaceous plant species along this trail or two-track included white clover (*Trifolium repens*), red clover (*Trifolium pratense*), black medic (*Medicago lupulina*), curly dock (*Rumex crispus*), broadleaf plantain (*Plantago major*), sedges, common chickweed (*Stellaria media*), and grasses (*Poa* and *Festuca* spp.)

Site 3 (A, B, C, and D) is mowed park habitat that is separated by Worth Street, Hoboken Alley, and Strader Avenue, respectively. This site is bound to the west by Humbert Avenue, the Ohio River Trail, Turkey Ridge Club, and the Ohio River Launch Club. The site receives periodic disturbance from occasional mowing and recreational play, varied filtered solar exposure, and is located on rich soil. Representative photographs of this habitat type are included in Appendix A-2.

The overstory vegetation includes cottonwood, hackberry (*Celtis occidentalis*), maples (*Acer* spp.), and oaks, (*Quercus* spp.), while the herbaceous plant community includes white clover, red clover, narrowleaf plantain (*Plantago lanceolata*), violets, broadleaf plantain, yellow nutsedge (*Cyperus esculentus*), common mallow (*Malva neglecta*), common purslane (*Portulaca oleracea*), and grasses.

Site 4 is mowed park habitat that is located at Schmidt Recreation Complex, adjacent to the Ohio River Trail. The site receives periodic disturbance from occasional mowing and recreational play, varied filtered solar exposure from scattered overstory trees in the area, and is located on rich soil. Representative photographs of this habitat type are included in Appendix A-2.

The overstory vegetation includes oaks and maples, while the herbaceous plant community includes white clover, red clover, dandelion (*Taraxacum officinale*), narrowleaf plantain (*Plantago lanceolata*), violets, and grasses.

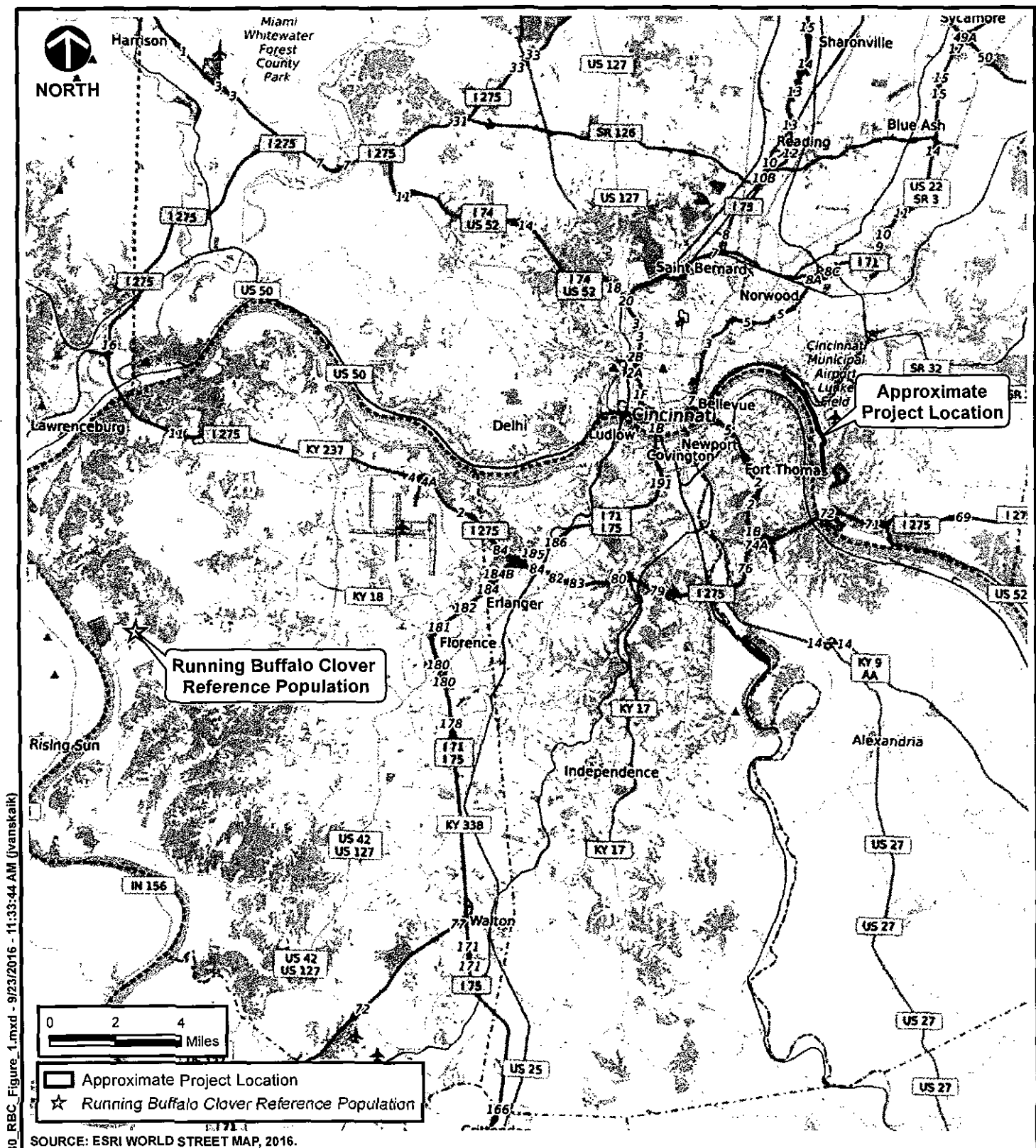
6.0 CONCLUSION

Bottomland hardwood forest and early successional habitat receiving filtered solar exposure, mowed areas, and trails are present within the Project area and surrounding vicinity. Based on the presence of these habitats, there is a potential for the presence of RBC. The RBC survey that was conducted by CEC on May 16, 18, and 19, 2016, did not reveal RBC individuals or populations within the Project area (Figures 4-19). Therefore, it is CEC's professional opinion that the proposed project is not likely to adversely affect the RBC.

7.0 REFERENCES

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FIGURES



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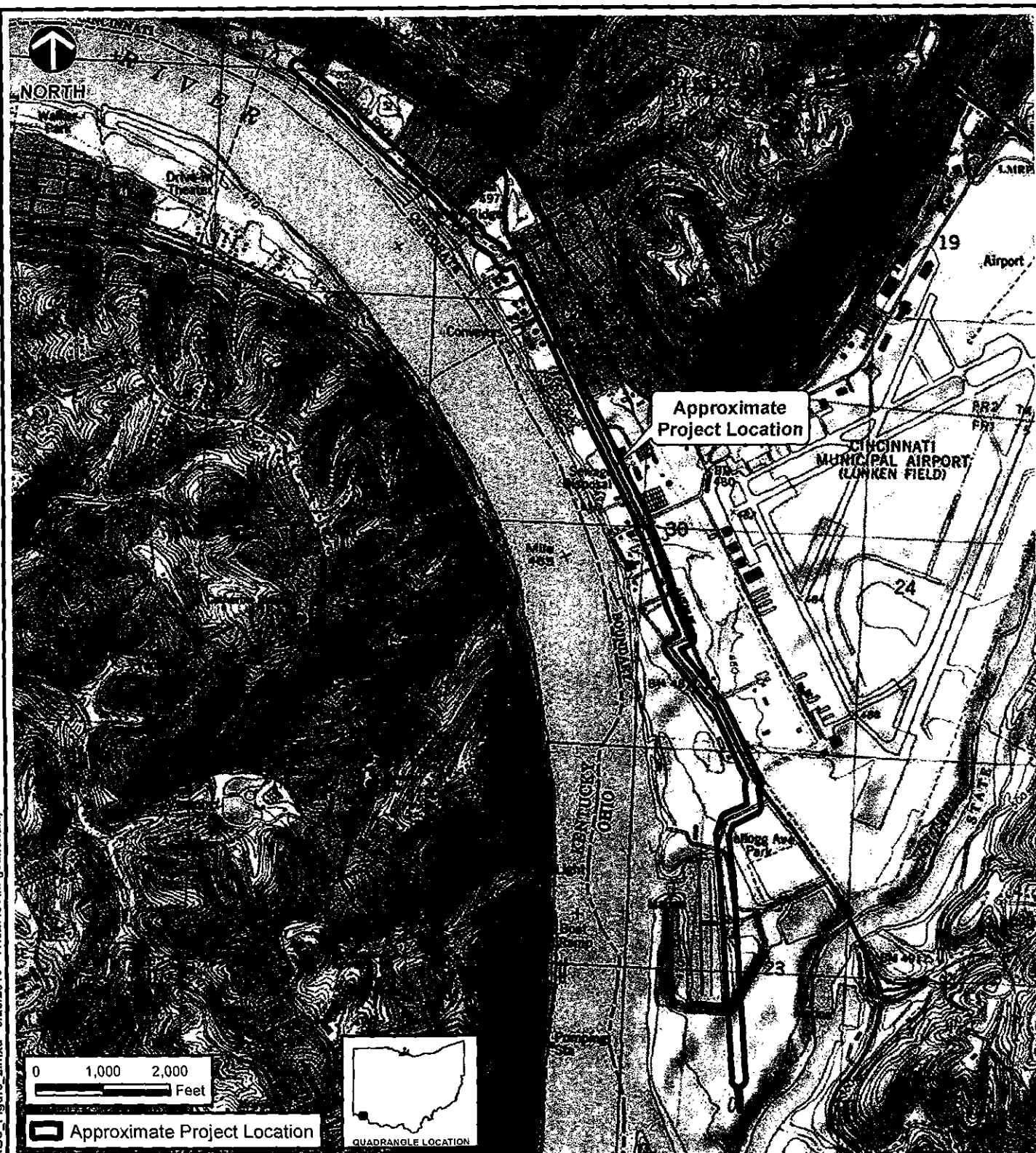
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REGIONAL LOCATION MAP

DRAWN BY:	DMG	CHECKED BY:	JAV	APPROVED BY:	JAV*	FIGURE NO:
DATE:	SEPTEMBER 23, 2016	DWG SCALE:	1" = 4 miles	PROJECT NO:	153-230	1

Signature on File *

P:\2016\153-230-GIS\Maps\RBCV153230_RBC_Figure 2.mxd - 9/23/2016 - 11:32:46 AM (jvanskalk)



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PROJECT LOCATION MAP

DRAWN BY: DMG	CHECKED BY: JAV	APPROVED BY: JAV*	FIGURE NO:
DATE: SEPTEMBER 23, 2016	DWG SCALE: 1" = 2,000'	PROJECT NO: 153-230	2

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SOURCE: USDA FSA NATIONAL AGRICULTURAL IMAGERY PROGRAM (NAIP) HAMILTON COUNTY MOSAIC. IMAGE DATE: 2015.

0 600 1,200 Feet

Variable Width Study Corridor



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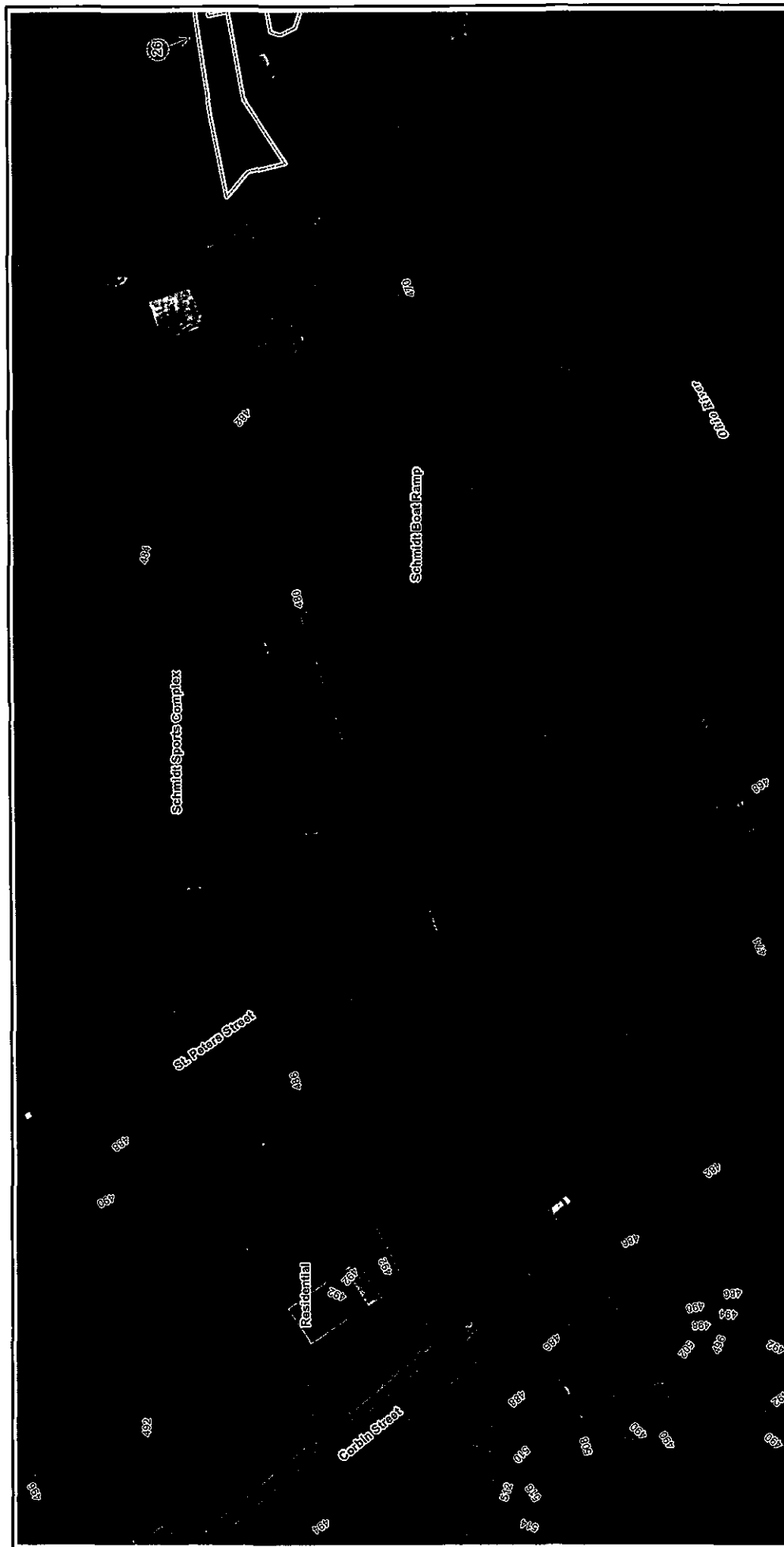
DUKE ENERGY
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 CINCINNATI, HAMILTON COUNTY, OHIO
 RUNNING BUFFALO CLOVER SURVEY
 INDEX MAP

DRAWN BY: DMG CHECKED BY: JAV
 DATE: SEPTEMBER 23, 2016 DWG SCALE: 1" = 1,200'

APPROVED BY: JAV
 PROJECT NO: 153-230

FIGURE NO: 3

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SOURCE: USDA PSA NATIONAL AGRICULTURAL IMAGERY PROGRAM (NAIP) HAMILTON COUNTY MOSAIC. IMAGE DATE: 2015.
 SOURCE: CAGIS 2-FOOT INTERVAL ELEVATION CONTOURS.



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- Existing Culvert
- 2-Foot Contour Interval
- Photograph Location and Direction

- Delineated Wetland
- Palustrine Emergent (PEM)
- Palustrine Forested (PFO)
- Wetland Determination Sample Point Location
- Ohio River or Backwater Area

- Proposed Replacement Pipeline
- Variable Width Study Corridor
- Potential Running Buffalo Clover Habitat
- Voucher Specimen Location with Photograph Number

NOTES: FULL EXTENT OF STUDY CORRIDOR IS WITHIN 100-YEAR FLOODPLAIN.
 NO STREAMS OR WATERBODIES WERE IDENTIFIED WITHIN THE STUDY CORRIDOR.

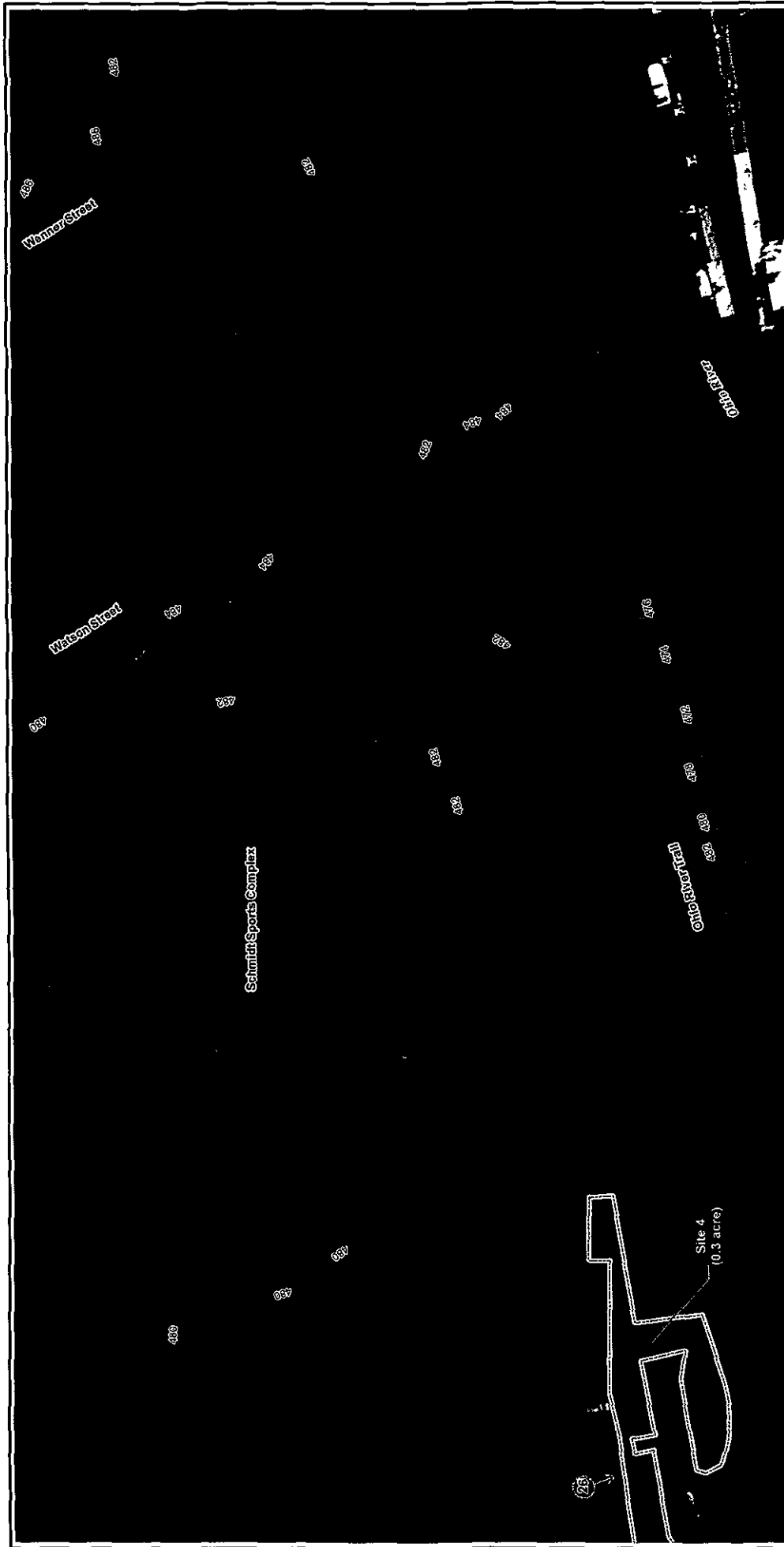


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RUNNING BUFFALO CLOVER SURVEY MAP

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 DATE: SEPTEMBER 23, 2016 DWG SCALE: 1" = 75' PROJECT NO: 153-230 FIGURE NO: 4

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NORTH

- ⊙ Existing Culvert
- 2-Foot Contour Interval
- Photograph Location and Direction
- ▨ Delineated Wetland
- ▨ Palustrine Emergent (PEM)
- ▨ Palustrine Forested (PFO)
- Wetland Determination Sample Point Location
- Ohio River or Backwater Area

- Proposed Replacement Pipeline
- Variable Width Study Corridor
- Potential Running Buffalo Clover Habitat
- ⊙ Voucher Specimen Location with Photograph Number

- ⊙ Voucher Specimen Location with Photograph Number

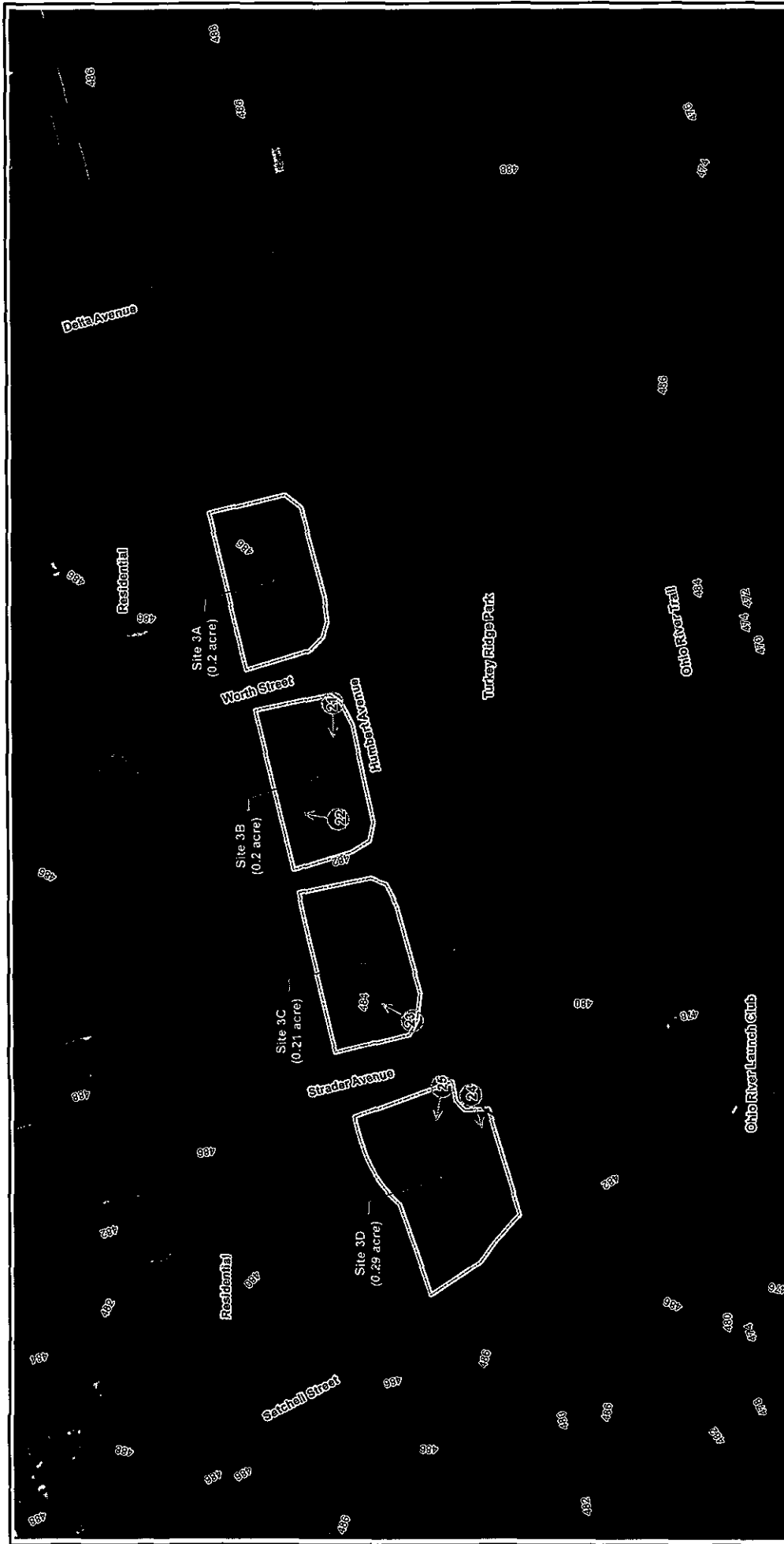
NOTES: FULL EXTENT OF STUDY CORRIDOR IS WITHIN 100-YEAR FLOODPLAIN.
NO STREAMS OR WATERBODIES WERE IDENTIFIED WITHIN THE STUDY CORRIDOR.



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CINCINNATI, HAMILTON COUNTY, OHIO
RUNNING BUFFALO CLOVER SURVEY MAP

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DWG SCALE: 1" = 75'
APPROVED BY: JAV
PROJECT NO: 153-230
FIGURE NO: 5

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SOURCE: CAGIS 2-FOOT INTERVAL ELEVATION CONTOURS.



- Existing Culvert
- 2-Foot Contour Interval
- Photograph Location and Direction

- Delineated Wetland
- Palustrine Emergent (PEM)
- Palustrine Forested (PFO)
- Wetland Determination Sample
- Point Location
- Ohio River or Backwater Area

- Proposed Replacement Pipeline
- Variable Width Study Corridor
- Potential Running Buffalo Clover Habitat
- Voucher Specimen Location with Photograph Number



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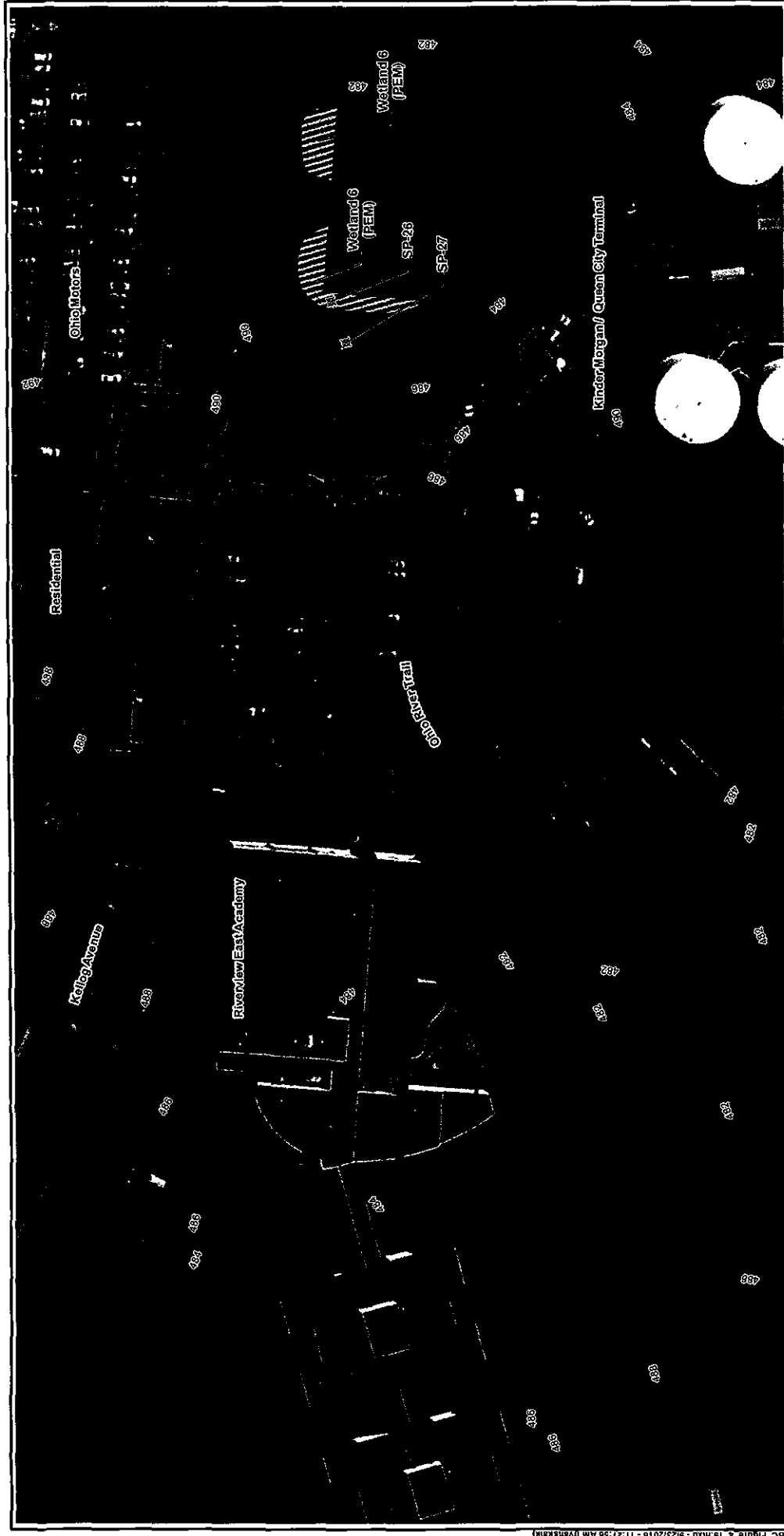
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RUNNING BUFFALO CLOVER SURVEY MAP

DRAWN BY: DMG CHECKED BY: JAV APPROVED BY: JAV
DATE: SEPTEMBER 23, 2016 DWG SCALE: 1" = 75' PROJECT NO: 153-230 FIGURE NO: 6

NOTES: FULL EXTENT OF STUDY CORRIDOR IS WITHIN 100-YEAR FLOODPLAIN.
NO STREAMS OR WATERBODIES WERE IDENTIFIED WITHIN THE STUDY CORRIDOR.

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SOURCE: USDA FSA NATIONAL AGRICULTURAL IMAGERY PROGRAM (NAIP) HAMILTON COUNTY MOSAIC. IMAGE DATE: 2015.
 SOURCE: CAGIS 2-FOOT INTERVAL ELEVATION CONTOURS.



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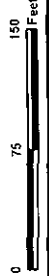
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 CINCINNATI, HAMILTON COUNTY, OHIO
 RUNNING BUFFALO CLOVER SURVEY MAP



- Existing Culvert
- 2-Foot Contour Interval
- Photograph Location and Direction

- Delineated Wetland
- Palustrine Emergent (PEM)
- Palustrine Forested (PFO)
- Wetland Determination Sample Point Location
- Ohio River or Backwater Area

- Proposed Replacement Pipeline
- Variable Width Study Corridor
- Potential Running Buffalo Clover Habitat
- Voucher Specimen Location with Photograph Number

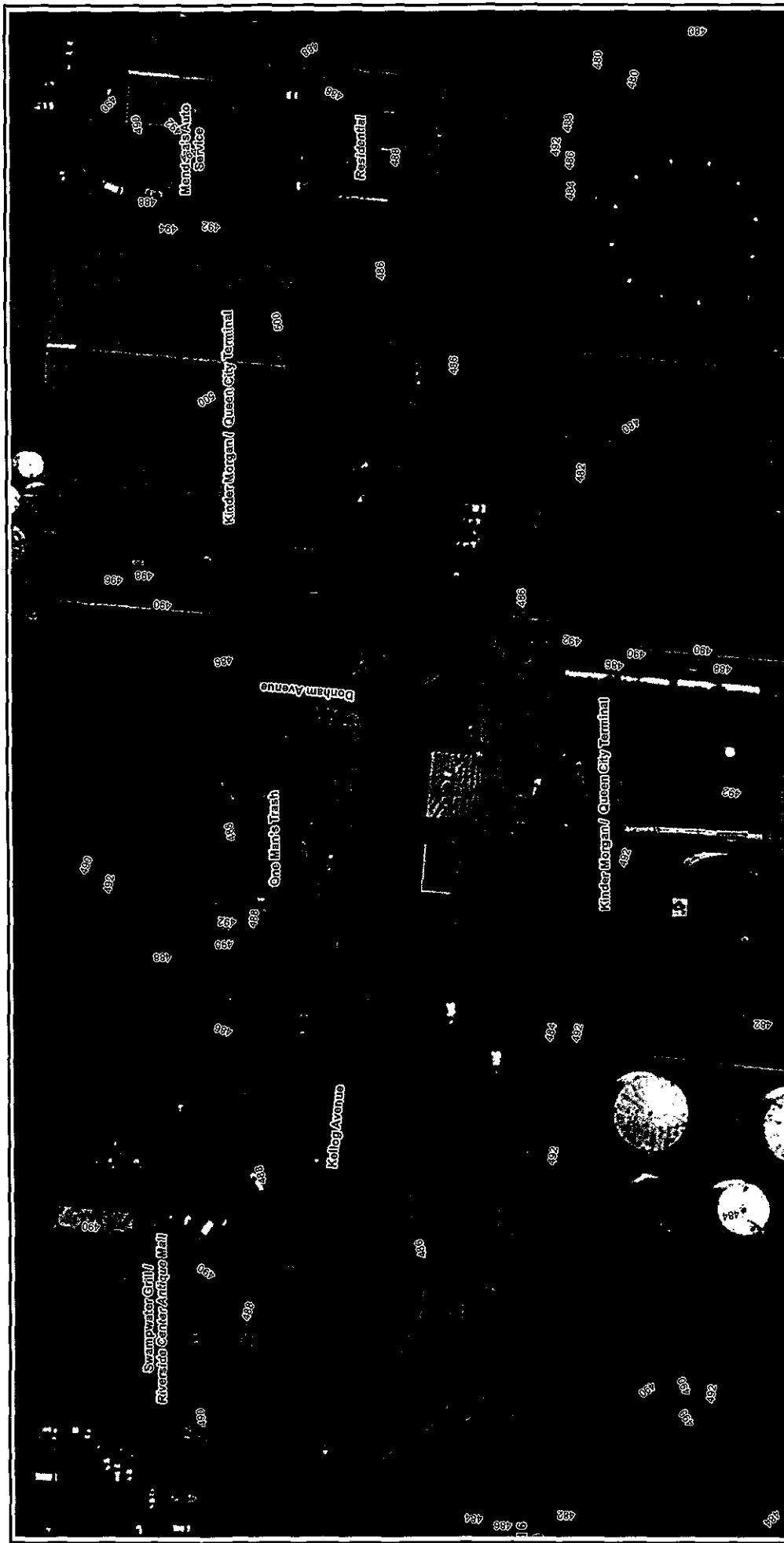


NOTES: FULL EXTENT OF STUDY CORRIDOR IS WITHIN 100-YEAR FLOODPLAIN.
 NO STREAMS OR WATERBODIES WERE IDENTIFIED WITHIN THE STUDY CORRIDOR.

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 PROJECT NO: 153-230

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 FIGURE NO: 7

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SOURCE: CAGIS 2-FOOT INTERVAL ELEVATION CONTOURS.



NORTH

- Existing Culvert
- 2-Foot Contour Interval
- Photograph Location and Direction

- Delineated Wetland
- Palustrine Emergent (PEM)
- Palustrine Forested (PFO)
- Wetland Determination Sample Point Location
- Ohio River or Backwater Area

- Proposed Replacement Pipeline
- Variable Width Study Corridor
- Potential Running Buffalo Clover Habitat
- Voucher Specimen Location with Photograph Number

NOTES: FULL EXTENT OF STUDY CORRIDOR IS WITHIN 100-YEAR FLOODPLAIN.
NO STREAMS OR WATERBODIES WERE IDENTIFIED WITHIN THE STUDY CORRIDOR.



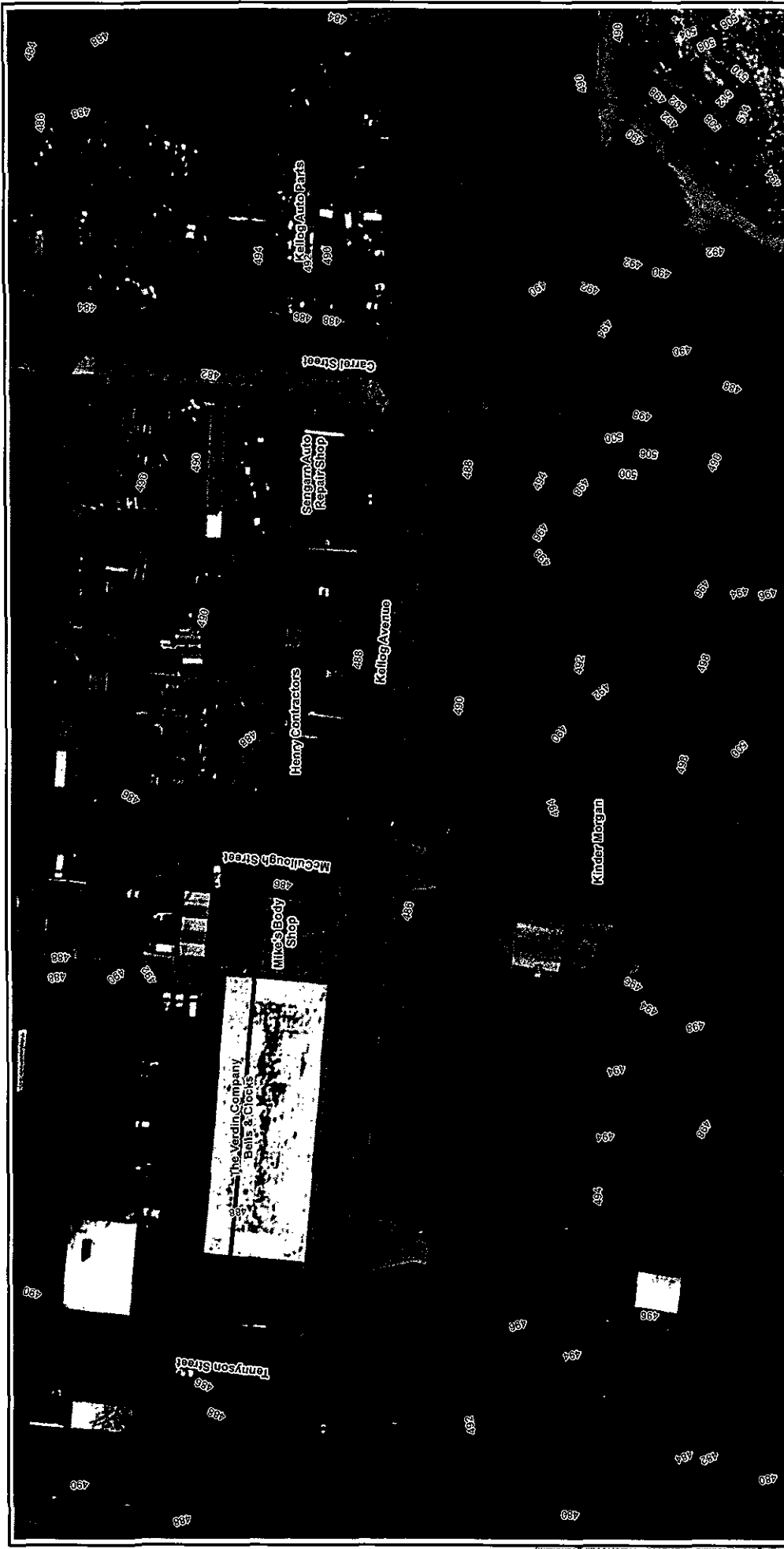
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CINCINNATI, HAMILTON COUNTY, OHIO

RUNNING BUFFALO CLOVER SURVEY MAP

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DATE:	SEPTEMBER 23, 2016	DWG SCALE:	1" = 75'	PROJECT NO.:	153-230

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NORTH

- Existing Culvert
- △ 2-Foot Contour Interval
- ▲ Photograph Location and Direction
- Delineated Wetland
 - ▨ Palustrine Emergent (PEM)
 - ▨ Palustrine Forested (PFO)
 - ▨ Wetland Determination Sample Point Location
 - Ohio River or Backwater Area
- ▭ Proposed Replacement Pipeline
 - ▭ Variable Width Study Corridor
 - ▭ Potential Running Buffalo Clover Habitat
 - Voucher Specimen Location with Photograph Number

NOTES: FULL EXTENT OF STUDY CORRIDOR IS WITHIN 100-YEAR FLOODPLAIN.
 NO STREAMS OR WATERBODIES WERE IDENTIFIED WITHIN THE STUDY CORRIDOR.



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RUNNING BUFFALO CLOVER SURVEY MAP	
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DATE: SEPTEMBER 23, 2016	FIGURE NO: 9
DWG SCALE: 1" = 75'	PROJECT NO: 153-230

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NORTH

- Proposed Replacement Pipeline
- Variable Width Study Corridor
- Potential Running Buffalo Clover Habitat
- Voucher Specimen Location with Photograph Number
- Delineated Wetland
- Palustrine Emergent (PEM)
- Palustrine Forested (PFO)
- Wetland Determination Sample Point Location
- Ohio River or Backwater Area
- Existing Culvert
- 2-Foot Contour Interval
- Photograph Location and Direction

NOTES: FULL EXTENT OF STUDY CORRIDOR IS WITHIN 100-YEAR FLOODPLAIN.
 NO STREAMS OR WATERBODIES WERE IDENTIFIED WITHIN THE STUDY CORRIDOR.



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 CINCINNATI, HAMILTON COUNTY, OHIO

RUNNING BUFFALO CLOVER SURVEY MAP

DRAWN BY:	JAV	APPROVED BY:	JAV	FIGURE NO:	10
DATE:	SEPTEMBER 23, 2016	DWG SCALE:	1" = 75'	PROJECT NO:	153-230

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	RUNNING BUFFALO CLOVER SURVEY MAP			
DRAWN BY: DMG DATE: SEPTEMBER 23, 2016	CHECKED BY: JAV DWG SCALE: 1" = 75'	APPROVED BY: JAV PROJECT NO: 153-230	FIGURE NO: 11	

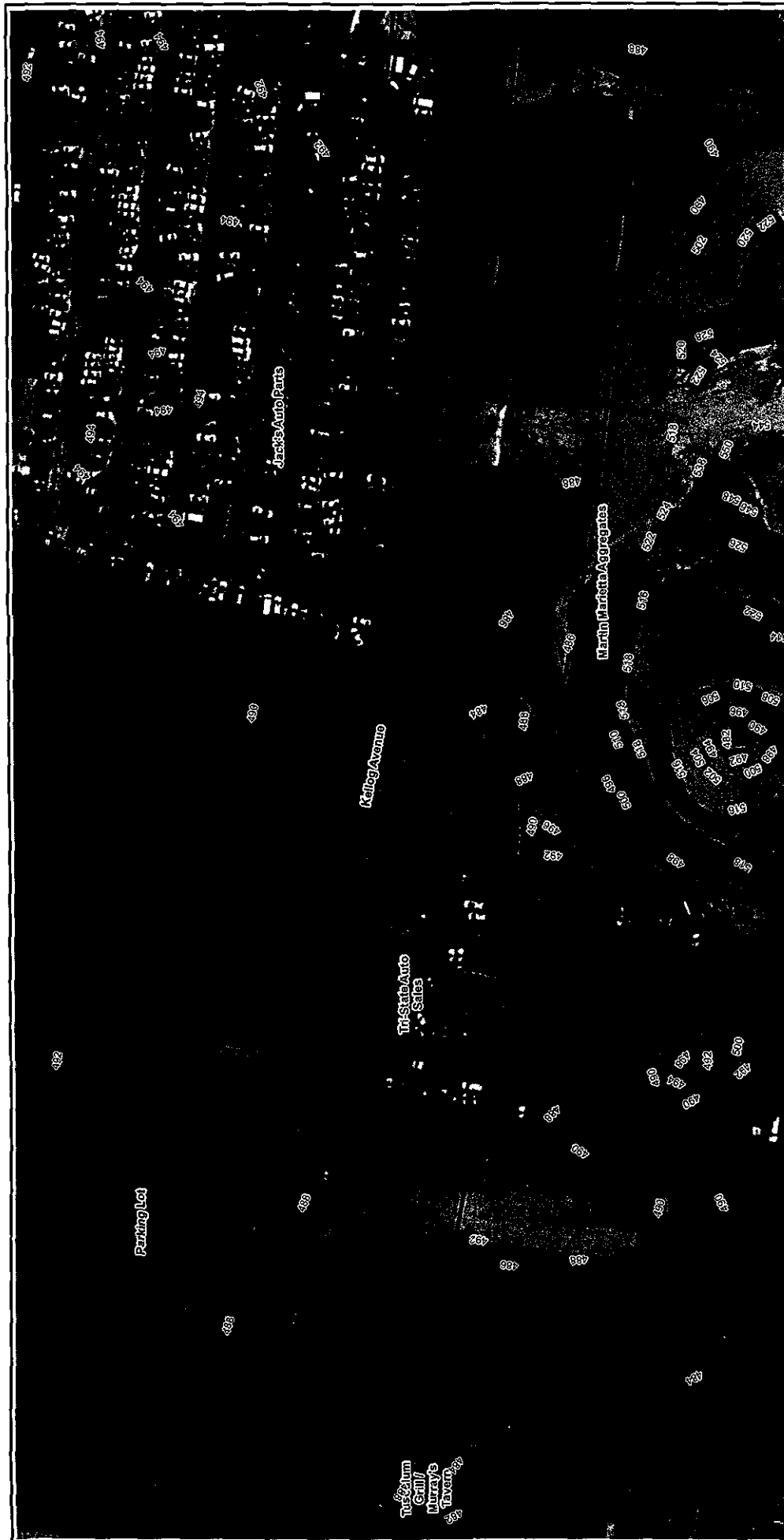
NORTH
 Existing Culvert
 2-Foot Contour Interval
 Photograph Location and Direction

Delineated Wetland
 Palustrine Emergent (PEM)
 Palustrine Forested (PFO)
 Wetland Determination Sample Point Location
 Ohio River or Backwater Area


Proposed Replacement Pipeline
 Variable Width Study Corridor
 Potential Running Buffalo Clover Habitat
 Voucher Specimen Location with Photograph Number

0 75 150 Feet














NOTES: FULL EXTENT OF STUDY CORRIDOR IS WITHIN 100-YEAR FLOODPLAIN.
NO STREAMS OR WATERBODIES WERE IDENTIFIED WITHIN THE STUDY CORRIDOR.



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DATE: SEPTEMBER 23, 2016		PROJECT NO: 153-230
DWS SCALE: 1" = 75'		FIGURE NO: 12

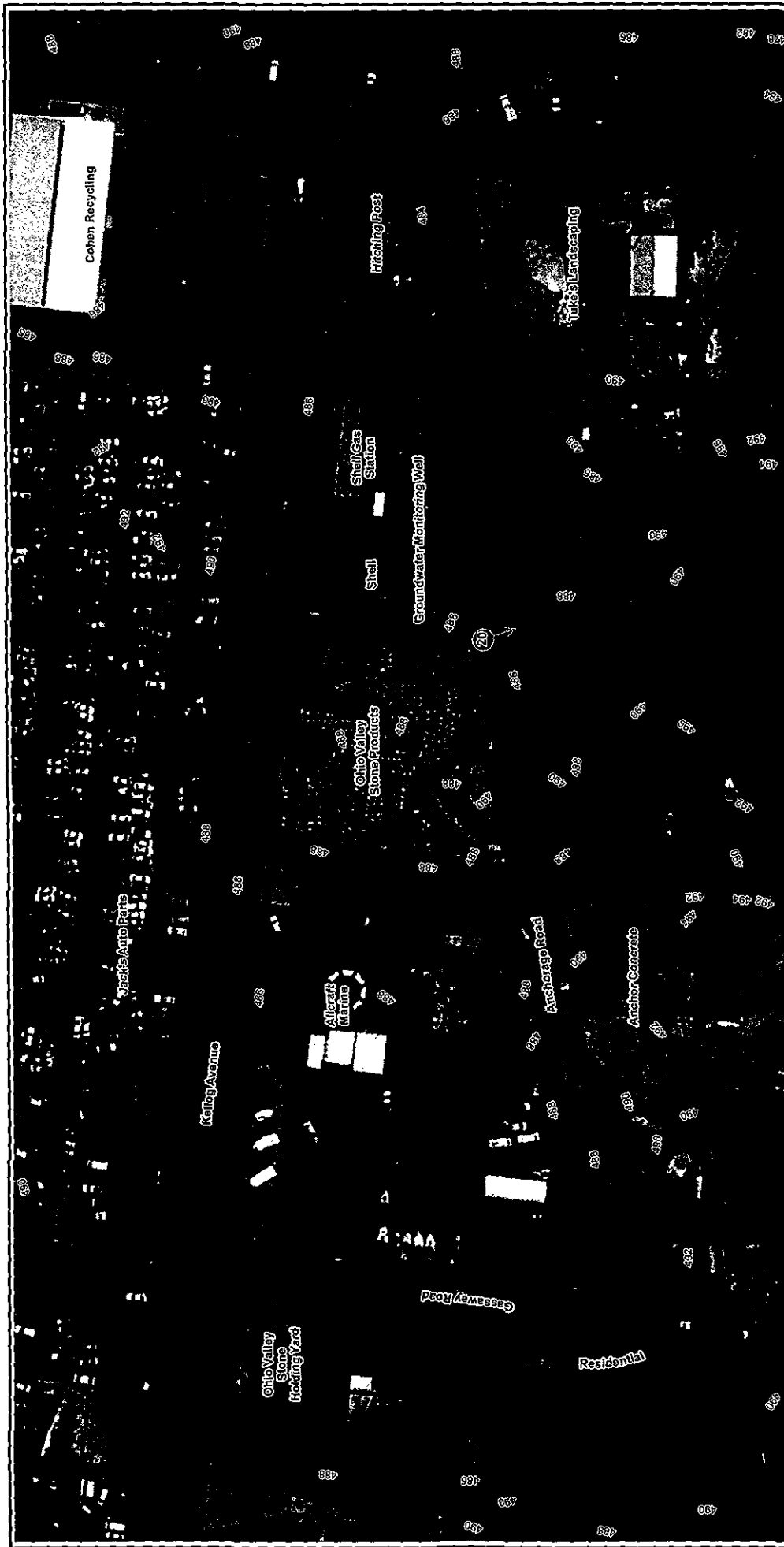
Legend

-  Proposed Replacement Pipeline
-  Variable Width Study Corridor
-  Potential Running Buffalo Clover Habitat
-  Voucher Specimen Location with Photograph Number
-  Delineated Wetland
-  Palustrine Emergent (PEM)
-  Palustrine Forested (PFO)
-  Wetland Determination Sample Point Location
-  Ohio River or Backwater Area
-  Existing Culvert
-  2-Foot Contour Interval
-  Photograph Location and Direction
-  NORTH

0 75 150 Feet

NOTES: FULL EXTENT OF STUDY CORRIDOR IS WITHIN 100-YEAR FLOODPLAIN.
 NO STREAMS OR WATERBODIES WERE IDENTIFIED WITHIN THE STUDY CORRIDOR.

Signature on File



SOURCE: USDA FSA NATIONAL AGRICULTURAL IMAGERY PROGRAM (NAIP) HAMILTON COUNTY MOSAIC, IMAGE DATE: 2015.
SOURCE: CAGIS 2-FOOT INTERVAL ELEVATION CONTOURS.



- Existing Culvert
- 2-Foot Contour Interval
- Photograph Location and Direction

- Delineated Wetland
- Palustrine Emergent (PEM)
- Palustrine Forested (PFO)
- Wetland Determination Sample
- Point Location
- Ohio River or Backwater Area

- Proposed Replacement Pipeline
- Variable Width Study Corridor
- Potential Running Buffalo Clover
- Habitat
- Voucher Specimen Location
- with Photograph Number



NOTES: FULL EXTENT OF STUDY CORRIDOR IS WITHIN 100-YEAR FLOODPLAIN.
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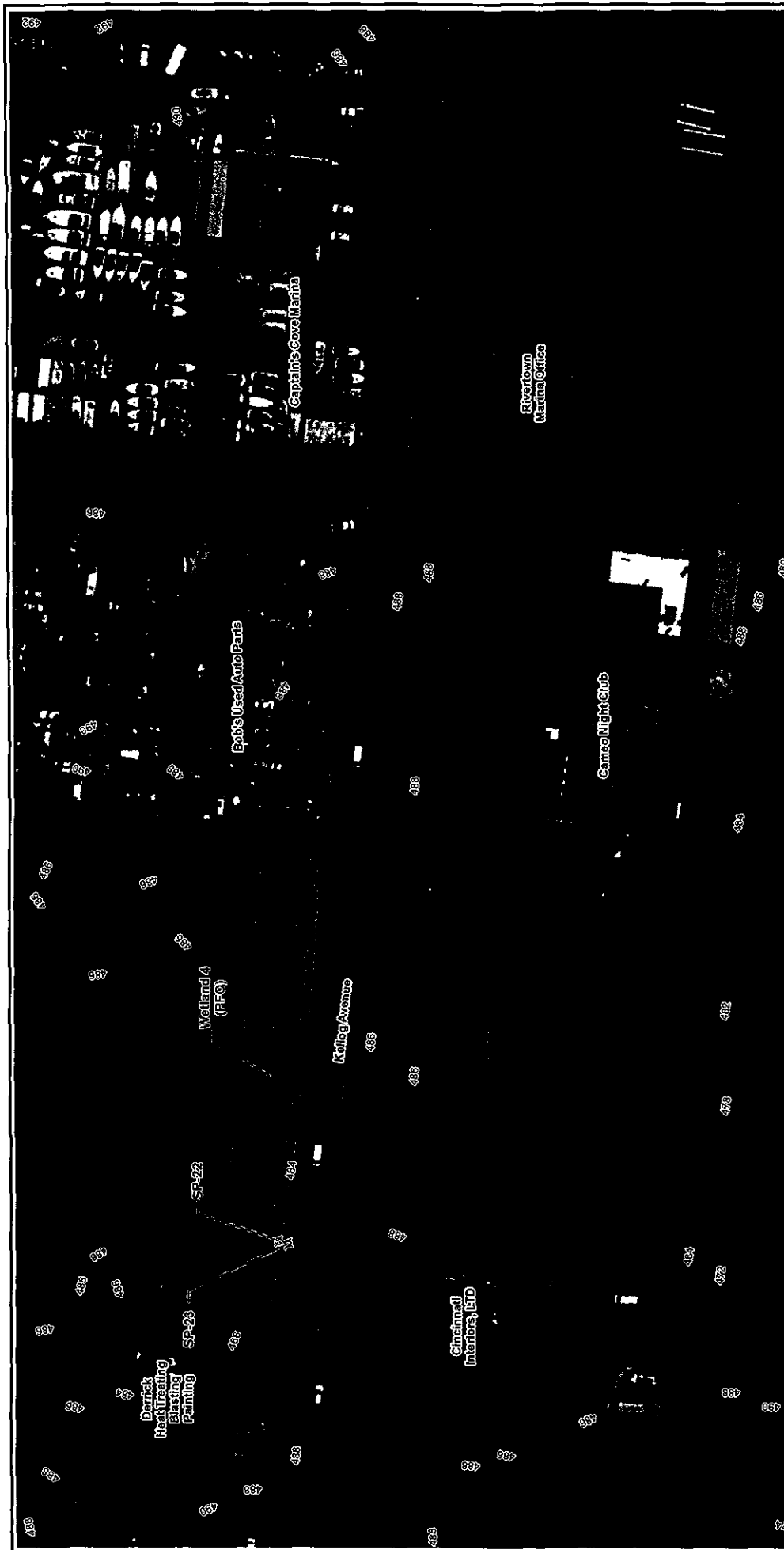
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CINCINNATI, HAMILTON COUNTY, OHIO
RUNNING BUFFALO CLOVER SURVEY MAP

DRAWN BY: DMG | CHECKED BY: JAV | APPROVED BY: JAV
DATE: SEPTEMBER 23, 2016 | DWG SCALE: 1" = 75' | PROJECT NO: 153-230 | FIGURE NO: 13

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SOURCE: CAGIS 2-FOOT INTERVAL ELEVATION CONTOURS.



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- Existing Culvert
- 2-Foot Contour Interval
- Photograph Location and Direction

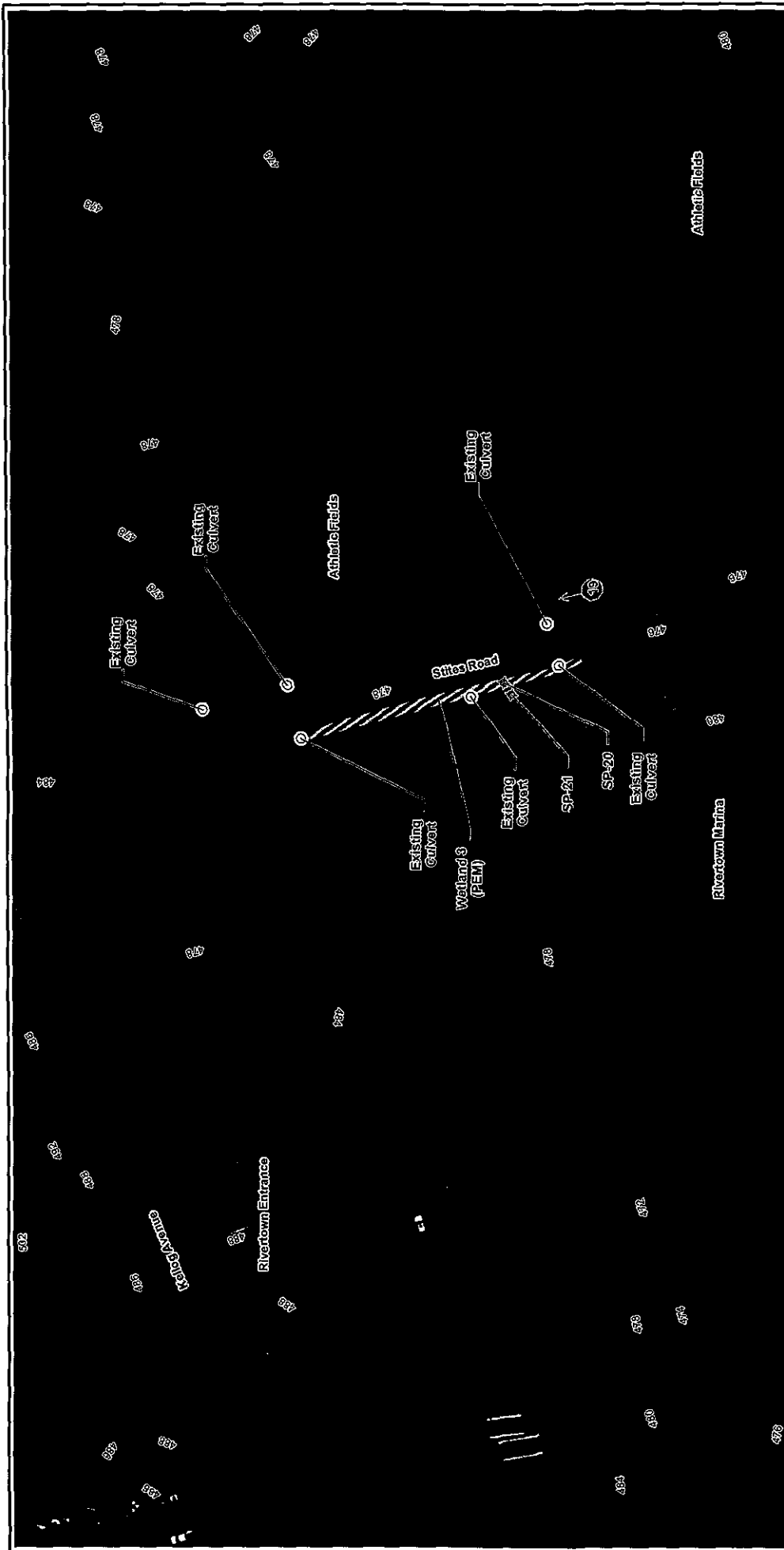
- Delineated Wetland
- Palustrine Emergent (PEM)
- Palustrine Forested (PFO)
- Wetland Determination Sample
- Point Location
- Ohio River or Backwater Area

- Proposed Replacement Pipeline
- Variable Width Study Corridor
- Potential Running Buffalo Clover Habitat
- Voucher Specimen Location with Photograph Number

NOTES: FULL EXTENT OF STUDY CORRIDOR IS WITHIN 100-YEAR FLOODPLAIN.
NO STREAMS OR WATERBODIES WERE IDENTIFIED WITHIN THE STUDY CORRIDOR.

DUKE ENERGY LINE D000B PIPELINE REPLACEMENT PROJECT CINCINNATI, HAMILTON COUNTY, OHIO	APPROVED BY: JAV PROJECT NO: 153-230	FIGURE NO: 14
RUNNING BUFFALO CLOVER SURVEY MAP	DRAWN BY: DMG DATE: SEPTEMBER 23, 2016	1" = 75'

Signature on File



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SOURCE: CAGIS 2-FOOT INTERVAL ELEVATION CONTOURS.



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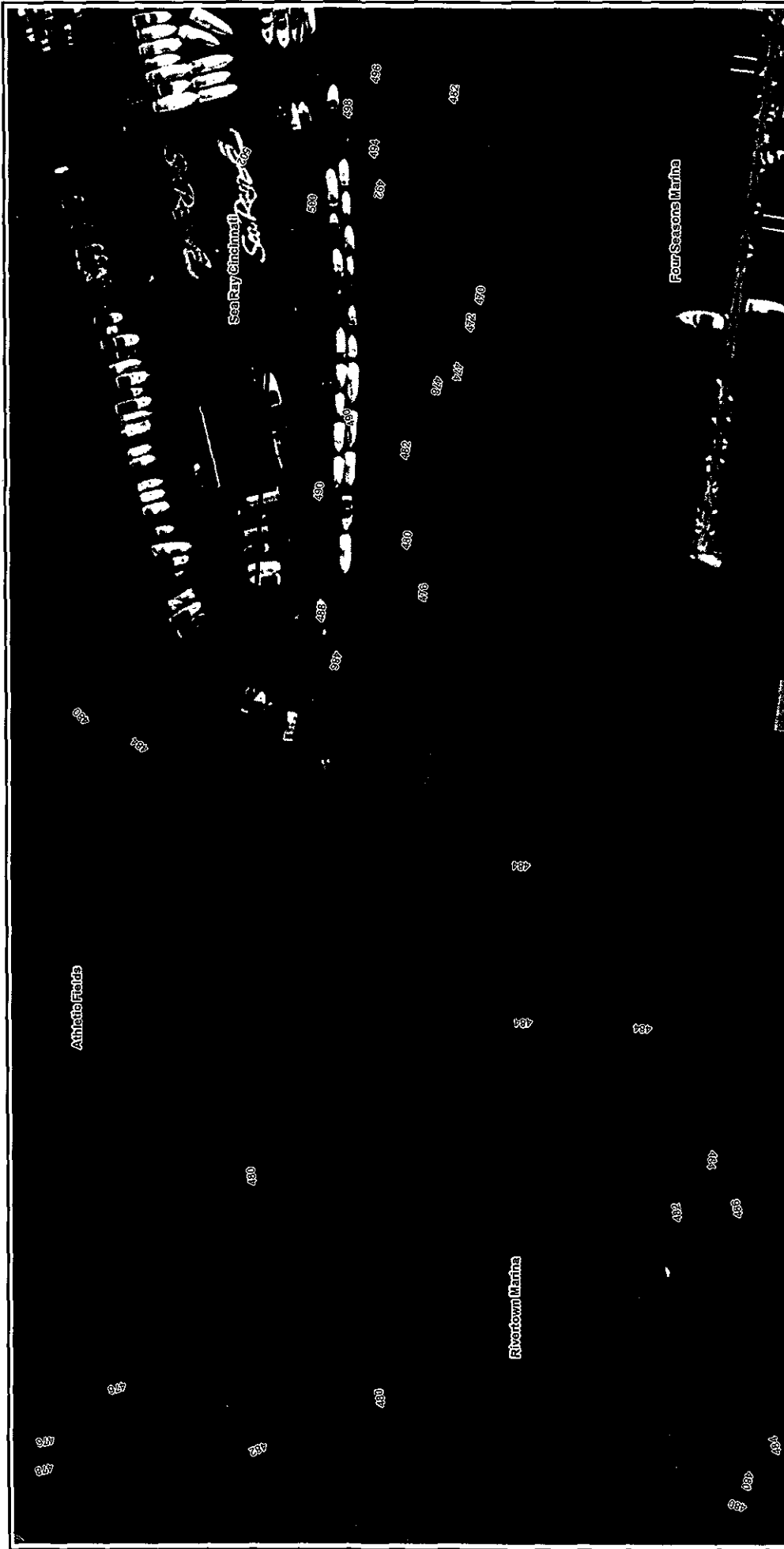
- Existing Culvert
- 2-Foot Contour Interval
- Photograph Location and Direction
- Delineated Wetland
 - Palustrine Emergent (PEM)
 - Palustrine Forested (PFO)
 - Wetland Determination Sample
 - Point Location
 - Ohio River or Backwater Area
- Proposed Replacement Pipeline
 - Variable Width Study Corridor
 - Potential Running Buffalo Clover Habitat
 - Voucher Specimen Location with Photograph Number



NOTES: FULL EXTENT OF STUDY CORRIDOR IS WITHIN 100-YEAR FLOODPLAIN.
NO STREAMS OR WATERBODIES WERE IDENTIFIED WITHIN THE STUDY CORRIDOR.

DUKE ENERGY LINE D000B PIPELINE REPLACEMENT PROJECT CINCINNATI, HAMILTON COUNTY, OHIO
RUNNING BUFFALO CLOVER SURVEY MAP
DRAWN BY: DMG CHECKED BY: JAV APPROVED BY: JAV
DATE: SEPTEMBER 23, 2016 DWG SCALE: 1" = 75'
PROJECT NO: 153-230
FIGURE NO: 15

Signature on File



SOURCE: USDA FSA NATIONAL AGRICULTURAL IMAGERY PROGRAM (NAIP) HAMILTON COUNTY MOSAIC. IMAGE DATE: 2015.
SOURCE: CAGIS 2-FOOT INTERVAL ELEVATION CONTOURS.



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5889 Montclair Boulevard - Cincinnati, OH 45215
513-985-0226 - 800-759-5814
www.cecinc.com



- Existing Culvert
- 2-Foot Contour Interval
- Photograph Location and Direction

- Delineated Wetland
- Palustrine Emergent (PEM)
- Palustrine Forested (PFO)
- Wetland Determination Sample Point Location
- Ohio River or Backwater Area

- Proposed Replacement Pipeline
- Variable Width Study Corridor
- Potential Running Buffalo Clover Habitat
- Voucher Specimen Location with Photograph Number

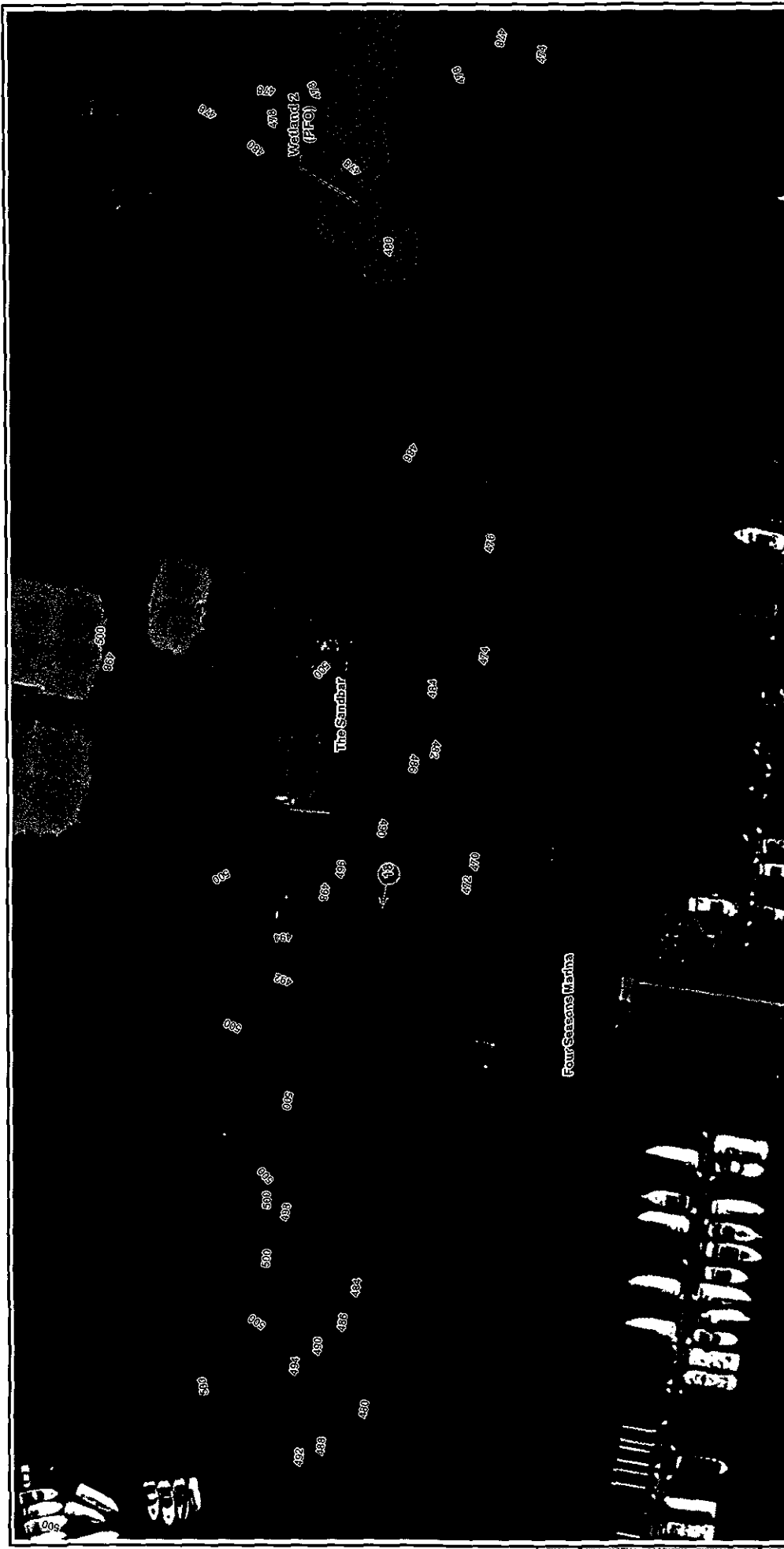


NOTES: FULL EXTENT OF STUDY CORRIDOR IS WITHIN 100-YEAR FLOODPLAIN.
NO STREAMS OR WATERBODIES WERE IDENTIFIED WITHIN THE STUDY CORRIDOR.

DUKE ENERGY
LINE D000B PIPELINE REPLACEMENT PROJECT
CINCINNATI, HAMILTON COUNTY, OHIO
RUNNING BUFFALO CLOVER SURVEY MAP

DRAWN BY: DMG CHECKED BY: JAV
DATE: SEPTEMBER 23, 2016 DWG SCALE: 1" = 75'
PROJECT NO: 153-230 FIGURE NO: 16

Signature on File



SOURCE: USDA FSA NATIONAL AGRICULTURAL IMAGERY PROGRAM (NAIP) HAMILTON COUNTY MOSAIC. IMAGE DATE: 2015.
 SOURCE: CAGIS 2-FOOT INTERVAL ELEVATION CONTOURS.



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NORTH

- ⊙ Existing Culvert
- 2-Foot Contour Interval
- ⋈ Photograph Location and Direction
- ⊕ Wetland Determination Sample Point Location
- Ohio River or Backwater Area

- ▨ Delineated Wetland
- ▨ Palustrine Emergent (PEM)
- ▨ Palustrine Forested (PFO)
- ⊕ Wetland Determination Sample Point Location
- Ohio River or Backwater Area

- ▨ Proposed Replacement Pipeline
- ▨ Variable Width Study Corridor
- ▨ Potential Running Buffalo Clover Habitat
- ⊕ Voucher Specimen Location with Photograph Number

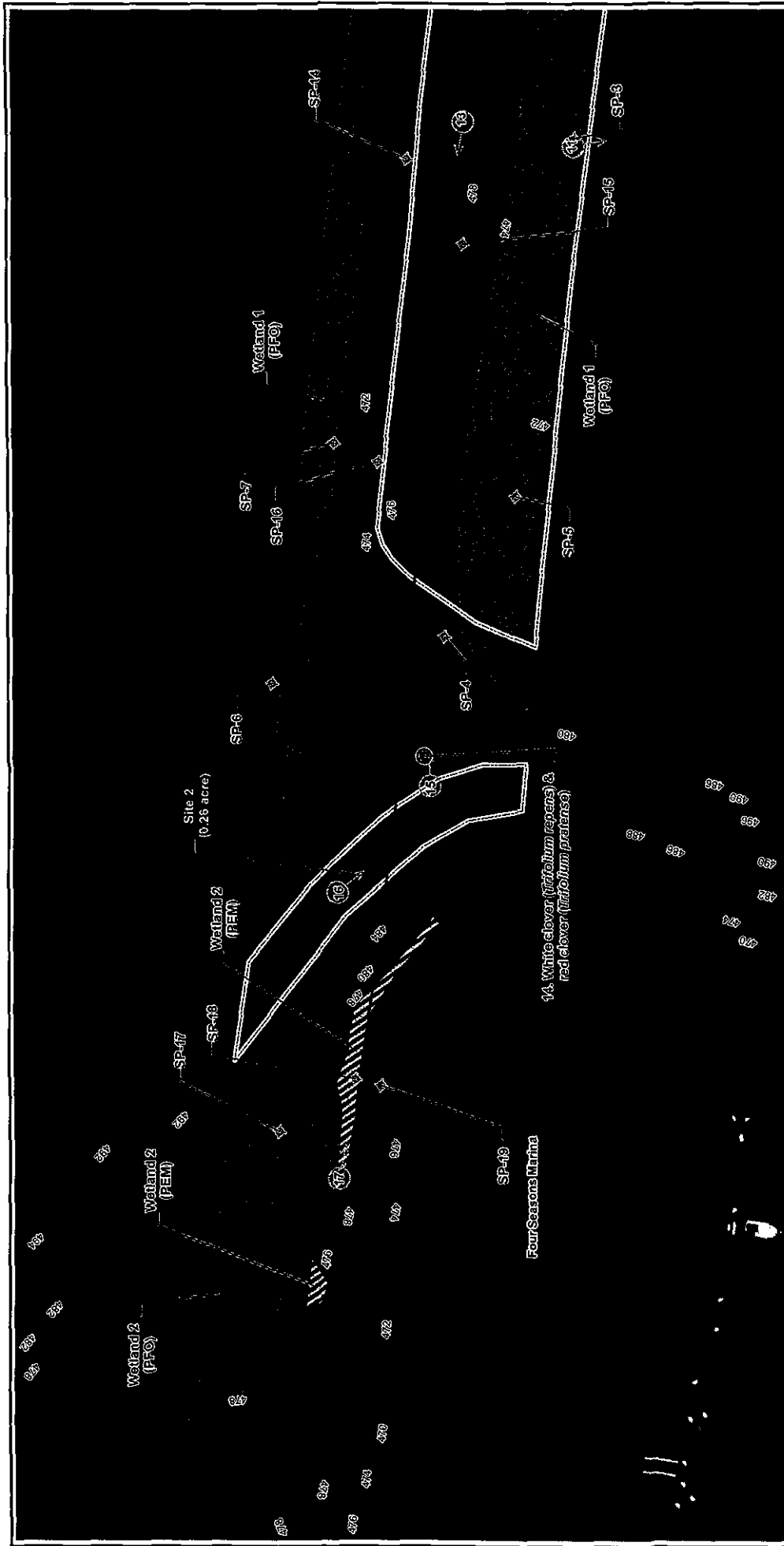
NOTES: FULL EXTENT OF STUDY CORRIDOR IS WITHIN 100-YEAR FLOODPLAIN.
 NO STREAMS OR WATERBODIES WERE IDENTIFIED WITHIN THE STUDY CORRIDOR.



DUKE ENERGY
 LINE D000B PIPELINE REPLACEMENT PROJECT
 CINCINNATI, HAMILTON COUNTY, OHIO
 RUNNING BUFFALO CLOVER SURVEY MAP

DRAWN BY:	JAV	CHECKED BY:	JAV	FIGURE NO:	17
DATE:	SEPTEMBER 23, 2016	DWG SCALE:	1" = 75'	PROJECT NO:	153-230

Signature on file



SOURCE: USDA FSA NATIONAL AGRICULTURAL IMAGERY PROGRAM (NAIP) HAMILTON COUNTY MOSAIC. IMAGE DATE: 2015.
SOURCE: CAGIS 2-FOOT INTERVAL ELEVATION CONTOURS.



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- Existing Culvert
- 2-Foot Contour Interval
- Photograph Location and Direction

- Delineated Wetland
- Palustrine Emergent (PEM)
- Palustrine Forested (PFO)
- Wetland Determination Sample Point Location
- Ohio River or Backwater Area

- Proposed Replacement Pipeline
- Variable Width Study Corridor
- Potential Running Buffalo Clover Habitat
- Voucher Specimen Location with Photograph Number

NOTES: FULL EXTENT OF STUDY CORRIDOR IS WITHIN 100-YEAR FLOODPLAIN.
NO STREAMS OR WATERBODIES WERE IDENTIFIED WITHIN THE STUDY CORRIDOR.

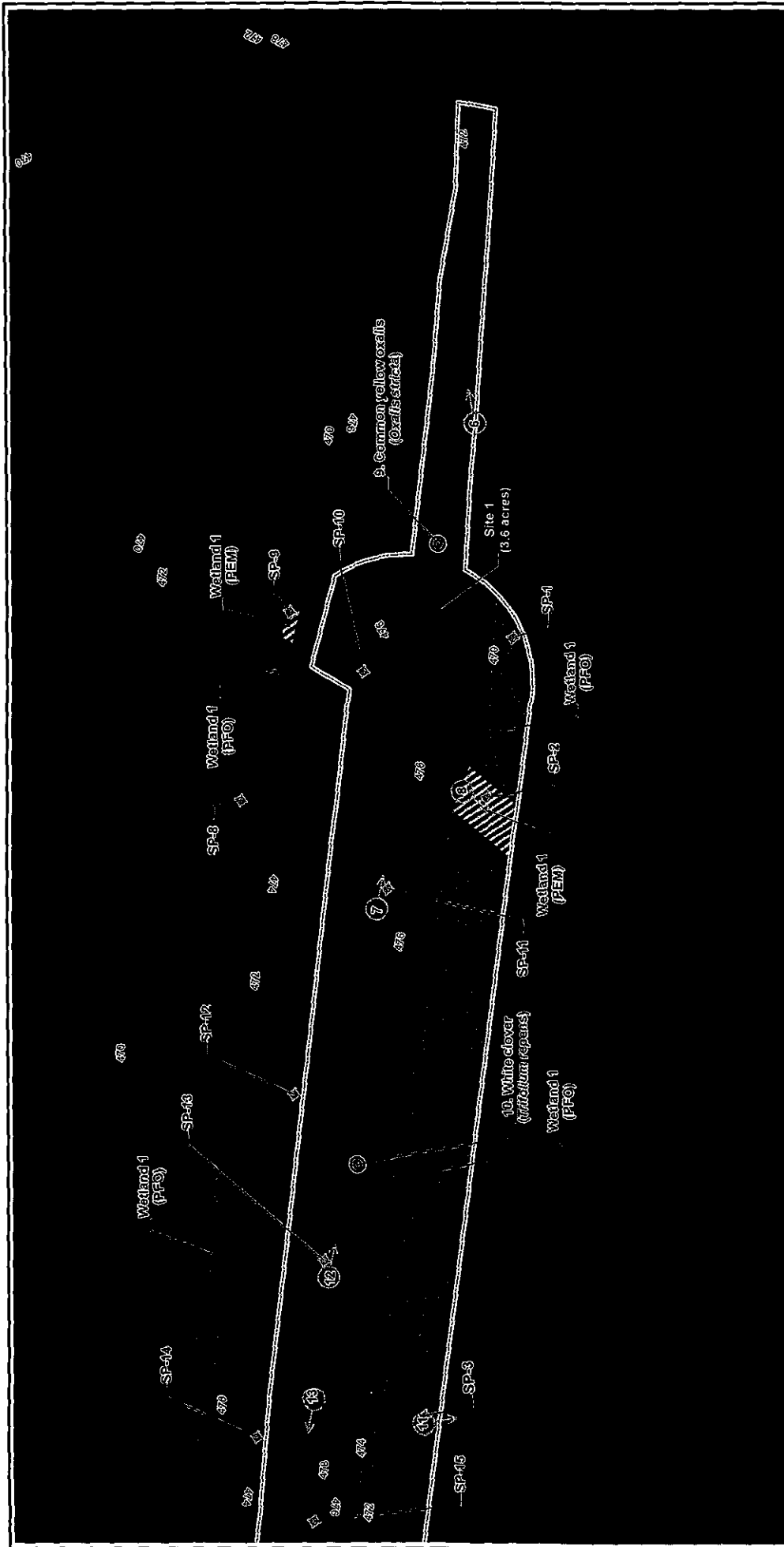


DUKE ENERGY
LINE D000B PIPELINE REPLACEMENT PROJECT
CINCINNATI, HAMILTON COUNTY, OHIO

RUNNING BUFFALO CLOVER SURVEY MAP

DRAWN BY:	DMG	CHECKED BY:	JAV	APPROVED BY:	JAV	FIGURE NO.	18
DATE:	SEPTEMBER 23, 2016	DMG SCALE:	1" = 75'	PROJECT NO:	153-230		

Signature on File



SOURCE: USDA FSA NATIONAL AGRICULTURAL IMAGERY PROGRAM (NAIP) HAMILTON COUNTY MOSAIC. IMAGE DATE: 2015.
SOURCE: CAGIS 2-FOOT INTERVAL ELEVATION CONTOURS.



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Existing Culvert
2-Foot Contour Interval
Photograph Location and Direction

Delineated Wetland
Palustrine Emergent (PEM)
Palustrine Forested (PFO)
Wetland Determination Sample
Point Location
Ohio River or Backwater Area

Proposed Replacement Pipeline
Variable Width Study Corridor
Potential Running Buffalo Clover
Habitat
Voucher Specimen Location
with Photograph Number

NOTES: FULL EXTENT OF STUDY CORRIDOR IS WITHIN 100-YEAR FLOODPLAIN.
NO STREAMS OR WATERBODIES WERE IDENTIFIED WITHIN THE STUDY CORRIDOR.

DUKE ENERGY
LINE D0008 PIPELINE REPLACEMENT PROJECT
CINCINNATI, HAMILTON COUNTY, OHIO

RUNNING BUFFALO CLOVER SURVEY MAP

DRAWN BY: DMG CHECKED BY: JAV
DATE: SEPTEMBER 23, 2016 DWG SCALE: 1" = 75'
PROJECT NO: 153-230
FIGURE NO: 19

Signature on File

APPENDIX A

PHOTOGRAPHS

APPENDIX A-1

REFERENCE POPULATION –
DINSMORE WOODS STATE NATURE PRESERVE



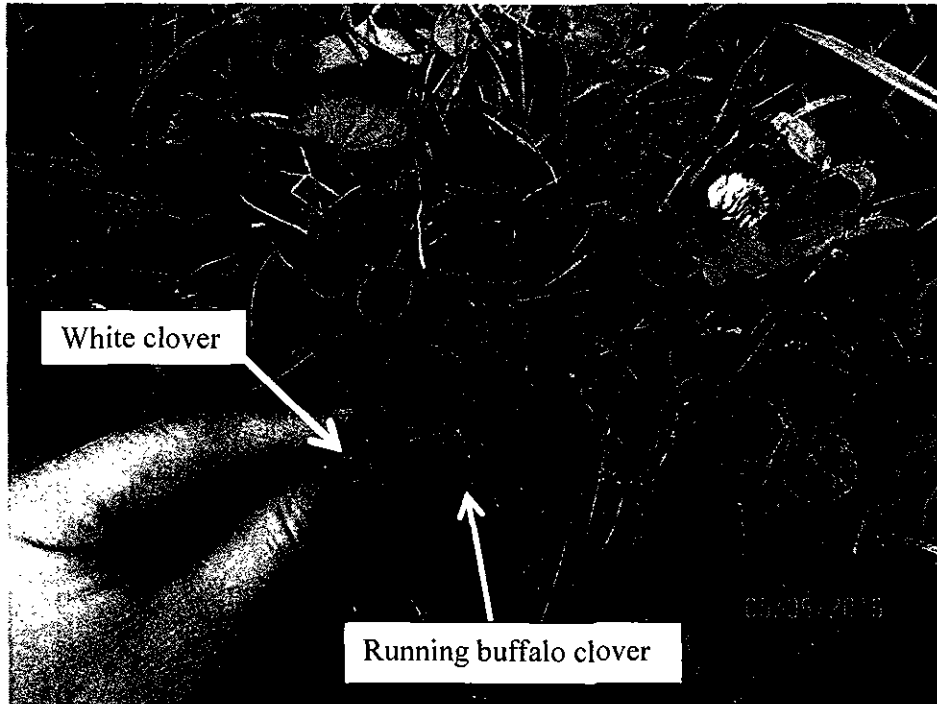
Photograph 1. RBC reference specimen from the Dinsmore Woods State Nature Preserve in Boone County, Kentucky. Note the opposite leaflets on the flowering stem.

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Cincinnati, Hamilton County, Ohio
CEC Project 153-230
Photographed on May 6, 2016



Photograph 2. Another view of RBC reference specimens from the Dinsmore Woods State Nature Preserve. Note the presence of stipules, an identifying characteristic.

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CEC Project 153-230
Photographed on May 6, 2016



Photograph 3. Comparison of RBC look-alike white clover to running buffalo clover at the Dinsmore Woods State Nature Preserve.



Photograph 4. RBC reference population habitat at the Dinsmore Woods State Nature Preserve.

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 Cincinnati, Hamilton County, Ohio
 CEC Project 153-230
 Photographed on May 6, 2016



Photograph 5. RBC reference population habitat at the Dinsmore Woods State Nature Preserve.

Line D000B Pipeline Replacement Project
Cincinnati, Hamilton County, Ohio
CEC Project 153-230
Photographed on May 6, 2016

APPENDIX A-2

SITE PHOTOGRAPHS



Photograph 6. View of maintained Line D000B ROW, south of proposed southern terminus of Project. Photograph taken facing south-southeast.

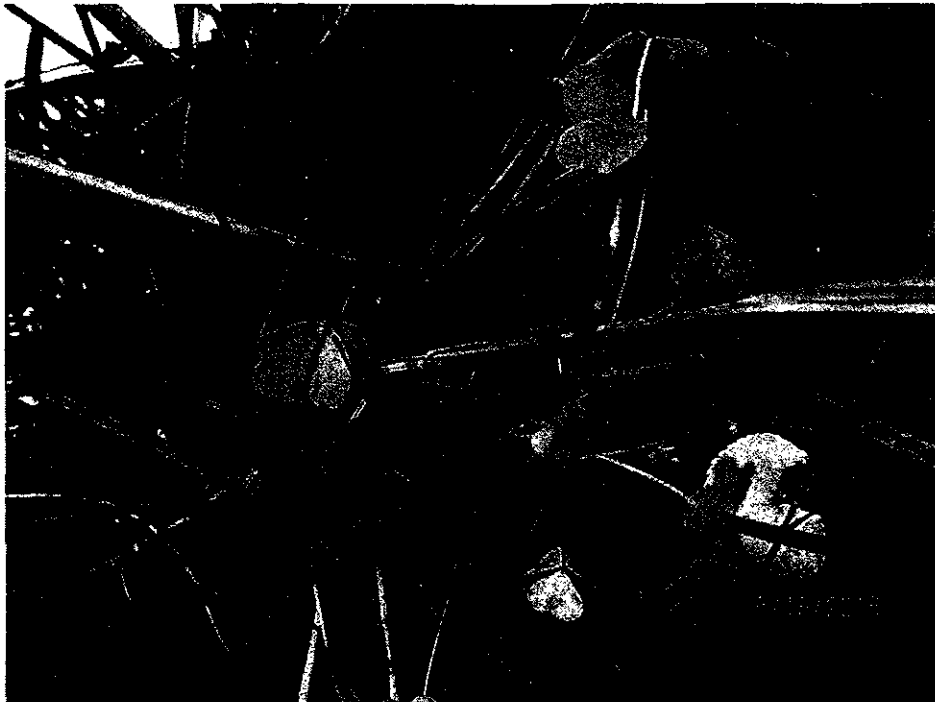


Photograph 7. View of existing Line D000B ROW at the southern terminus of study corridor. Photograph taken facing south.

Line D000B Pipeline Replacement Project
Cincinnati, Hamilton County, Ohio
CEC Project 153-230
Photographed on May 16, 18 and 19, 2016



Photograph 8. Representative view of the PEM portion of Wetland 1.
Photograph taken facing north-northwest along existing, maintained utility ROW.



Photograph 9. Common yellow oxalis (*Oxalis stricta*) voucher specimen.

Line D000B Pipeline Replacement Project
Cincinnati, Hamilton County, Ohio
CEC Project 153-230
Photographed on May 16, 18 and 19, 2016



Photograph 10. White clover voucher specimen.



Photograph 11. View of the PFO portion of Wetland 1 along the west side of the Line D000B ROW near the southern terminus of the Project.

Photograph taken facing west.

Line D000B Pipeline Replacement Project

Cincinnati, Hamilton County, Ohio

CEC Project 153-230

Photographed on May 16, 18 and 19, 2016

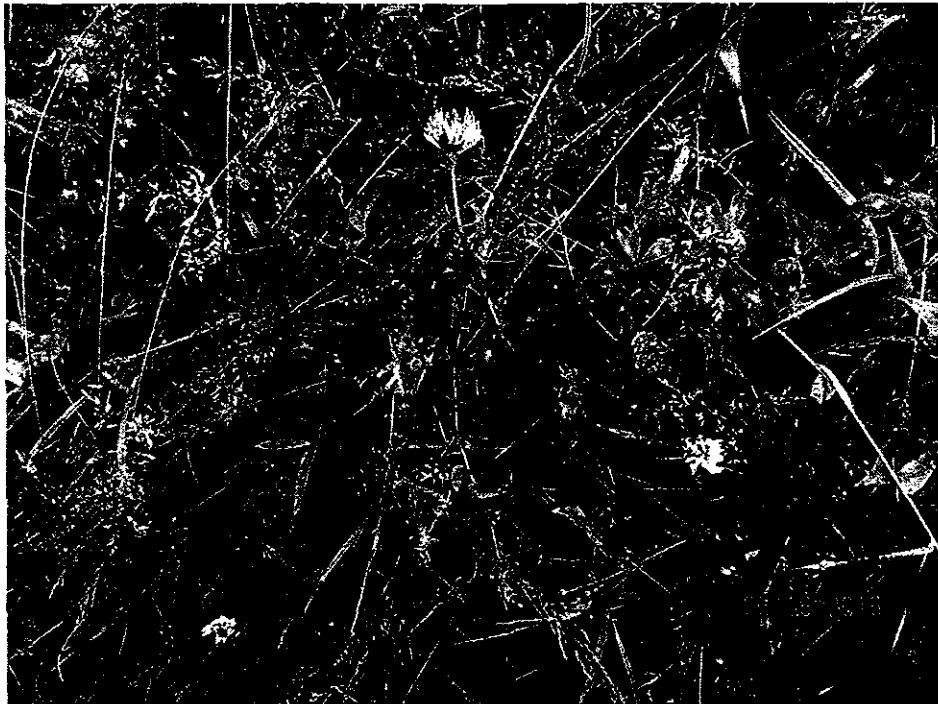


Photograph 12. Representative view of elevated and maintained ROW, bisecting Wetland 1 at wetland determination SP-6. Photograph taken facing south.



Photograph 13. Representative view of elevated and maintained Line D000B ROW, bisecting Wetland 1. Photograph taken facing north.

Line D000B Pipeline Replacement Project
 Cincinnati, Hamilton County, Ohio
 CEC Project 153-230
 Photographed on May 16, 18 and 19, 2016



Photograph 14. White and red clover (*Trifolium pratense*) voucher specimens.



Photograph 15. Elevated view of existing bermed, maintained Line D000B ROW, bisecting Wetland 1. Photograph taken facing south.

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Cincinnati, Hamilton County, Ohio
CEC Project 153-230
Photographed on May 16, 18 and 19, 2016



Photograph 16. View of white clover and other herbaceous vegetation growing along trail or two track that is located on an embankment that formerly functioned as railroad corridor, facing southwest.



Photograph 17. View of the PEM portion of Wetland 2, facing south.

Line D000B Pipeline Replacement Project
 Cincinnati, Hamilton County, Ohio
 CEC Project 153-230
 Photographed on May 16, 18 and 19, 2016

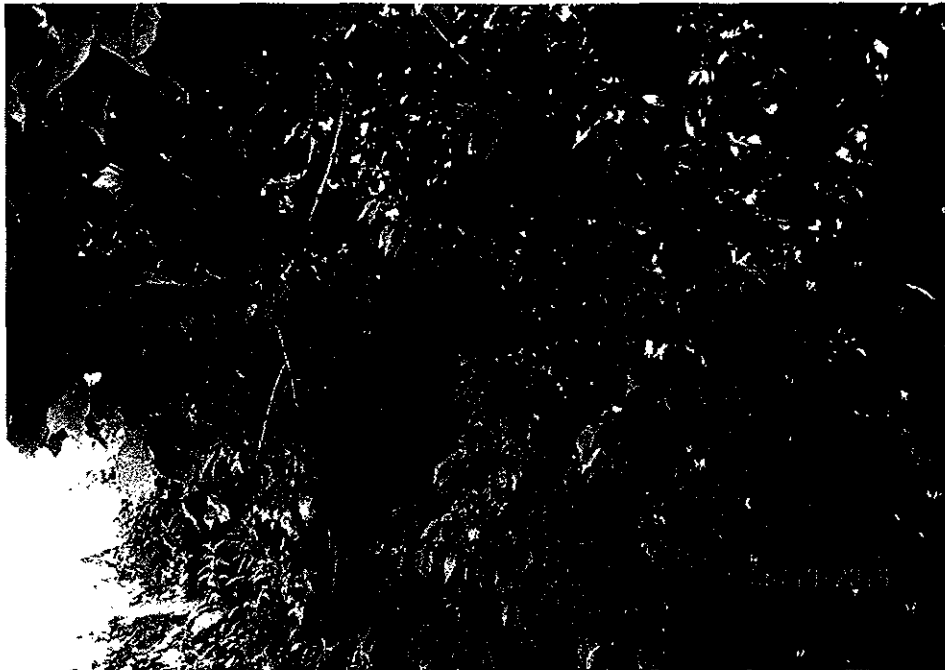


Photograph 18. View of maintained Line D000B ROW, east of Four Seasons Marina.
Photograph taken facing south-southeast.



Photograph 19. View of maintained Line D000B ROW, along Kellogg Avenue Park and Stites Road. Photograph taken facing east-northeast.

Line D000B Pipeline Replacement Project
Cincinnati, Hamilton County, Ohio
CEC Project 153-230
Photographed on May 16, 18 and 19, 2016



Photograph 20. View of dense Amur honeysuckle in wooded area along Anchorage Road.



Photograph 21. View of mowed park habitat receiving filtered sunlight and periodic disturbance along east side of Humbert Avenue. Photograph taken facing north-northwest.

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 Cincinnati, Hamilton County, Ohio
 CEC Project 153-230
 Photographed on May 16, 18 and 19, 2016



Photograph 22. View of groundcover from mowed park habitat along east side of Humbert Avenue.



Photograph 23. Another view of mowed park habitat along east side of Humbert Avenue. Photograph taken facing east.

Line D000B Pipeline Replacement Project
Cincinnati, Hamilton County, Ohio
CEC Project 153-230
Photographed on May 16, 18 and 19, 2016



Photograph 24. View of trail and mowed park habitat on west side of Strader Avenue.
Photograph taken facing north-northwest.



Photograph 25. View of mowed park habitat with filtered sunlight on the
west side of Strader Avenue. Photograph taken facing north.

Line D000B Pipeline Replacement Project
Cincinnati, Hamilton County, Ohio
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Photographed on May 16, 18 and 19, 2016



Photograph 26. View of mowed park habitat with filtered sunlight at Schmidt Recreation Complex. Photograph taken facing south-southwest.

Line D000B Pipeline Replacement Project
Cincinnati, Hamilton County, Ohio
CEC Project 153-230
Photographed on May 16, 18 and 19, 2016

APPENDIX B

**COUNTY DISTRIBUTION OF FEDERALLY-LISTED THREATENED,
ENDANGERED, PROPOSED, AND CANDIDATE SPECIES IN
HAMILTON COUNTY, OHIO**

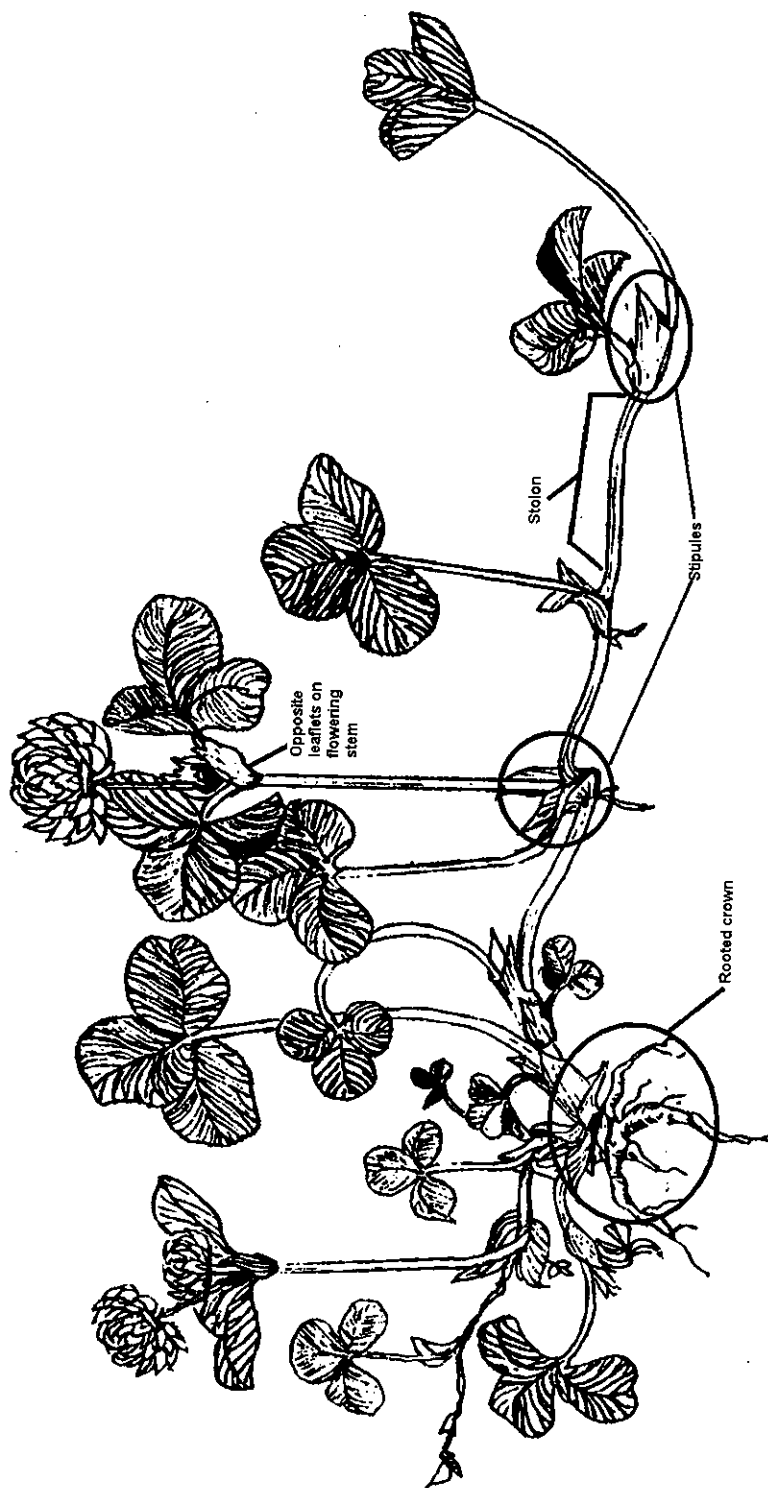
Excerpt from September 2016 USFWS State of Ohio County Distribution List of Federally-Listed Threatened, Endangered, Proposed, and Candidate Species

	Rayed bean (<i>Villosa fabalis</i>)	Endangered	Smaller, headwater creeks, but they are sometimes found in large rivers
	Snuffbox (<i>Epioblasma triquetra</i>)	Endangered	Small to medium-sized creeks and some larger rivers, in areas with a swift current
Guernsey	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
Hamilton	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Fanshell (<i>Cyprogenia stegaria</i>) (= <i>C. irrorata</i>)	Endangered	Found in areas of packed sand and gravel at locations in a good current
	Pink mucket pearlymussel (<i>Lampsilis abrupta</i>)	Endangered	The lower Ohio River and its larger tributaries
	Rayed bean (<i>Villosa fabalis</i>)	Endangered	Smaller, headwater creeks, but they are sometimes found in large rivers
	Sheepnose (<i>Plethobasus cyphus</i>)	Endangered	Shallow areas in larger rivers and streams
	Snuffbox (<i>Epioblasma triquetra</i>)	Endangered	Small to medium-sized creeks and some larger rivers, in areas with a swift current
	Running buffalo clover (<i>Trifolium stoloniferum</i>)	Endangered	Disturbed bottomland meadows; disturbed sites that have shade during part of each day
Hancock	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
	Northern long-eared bat <i>Myotis septentrionalis</i>	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. During late spring and summer roosts and forages in upland forests.
	Clubshell (<i>Pleurobema clava</i>)	Endangered	Found in coarse sand and gravel areas of runs and riffles within streams and small rivers
	Rayed bean (<i>Villosa fabalis</i>)	Endangered	Smaller, headwater creeks, but they are sometimes found in large rivers
Hardin	Indiana bat (<i>Myotis sodalis</i>)	Endangered	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests

APPENDIX C

RUNNING BUFFALO CLOVER SCHEMATIC

Running Buffalo Clover Schematic



ATTACHMENT 8

RUNNING BUFFALO CLOVER SURVEY REPORT

September 23, 2016

Mr. Steve Lane, CPESC, AICP, PMP
Senior Environmental Scientist
Duke Energy Corporation
139 East Fourth Street, Room EM740
Cincinnati, OH 45202

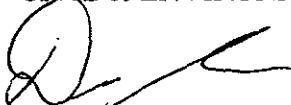
Dear Mr. Lane:

Subject: Running Buffalo Clover Survey Report
Line D000B Pipeline Replacement Project
Cincinnati, Hamilton County, Ohio
CEC Project 153-230

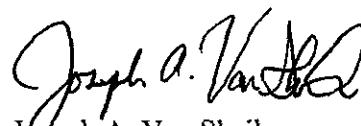
Civil & Environmental Consultants, Inc. (CEC) is pleased to present the attached running buffalo clover (RBC) survey report for the Duke Energy Corporation (Duke Energy) Line D000B Pipeline Replacement Project, located in Cincinnati, Hamilton County, Ohio. CEC's services were provided in accordance with the Master Consulting Services Agreement, effective June 1, 2015, between Duke Energy and CEC, and our revised proposal dated February 1, 2016. We appreciate the opportunity to be of service to Duke Energy on this project. Please call us if you have any questions regarding the attached report.

Sincerely,

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.



Dustin M. Giesler
Staff Scientist



Joseph A. Van Skaik
Project Manager

Attachment: Running Buffalo Clover Survey Report