Additional Hydraulic Improvements Project

Threatened and Endangered Species Habitat Assessment Report

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Maumee Watershed Conservancy District

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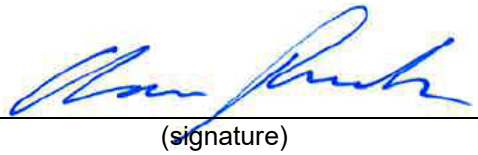
Prepared by 
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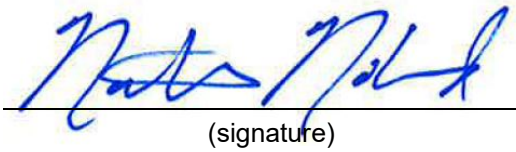
Reviewed by 
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EXECUTIVE SUMMARY

On the behalf of Hancock County and the Maumee Watershed Conservancy District (MWCD, "the client"), Stantec Consulting Services, Inc. (Stantec) was tasked with reviewing existing data associated with analysis completed by the U.S. Army Corps of Engineers, Buffalo District (USACE) regarding the recommendation of additional floodplain benching along the Blanchard River in search of potential alternative solutions to reduce the risk of overbank flooding from the Blanchard River and its tributaries. This area is described in the *Western Lake Erie Basin (WLEB) Blanchard River Watershed Study, Draft Detailed Project Report/Environmental Impact Statement* (USACE Draft EIS, April 2015). As part of the Hancock County Flood Risk Reduction (HCFRR) Program, Stantec's efforts thus far include the recommendation for hydraulic improvements along the Blanchard River in the City of Findlay.

Stantec conducted a wetland and waterbody delineation study and habitat assessment field surveys for potential federally listed and State-listed threatened and endangered species habitats within the Additional Hydraulic Improvements Project area (the Project area) on July 22, 2020 (Figure 1, Appendix A). The dominant habitats and land uses within the Project area consisted of mixed early successional/second growth riparian forest, industrial, and maintained lawn habitats, The locations of habitats and land uses identified within the Project area are shown on Figure 2 in Appendix A.

As part of the continued assistance to Hancock County and MWCD to support the HCFRR Program, Stantec was retained by MCWD to review available information and conduct a threatened and endangered species habitat assessment within the Project area,. A threatened and endangered species habitat assessment was conducted by Stantec on July 22, 2020 within the Project area to determine if the proposed work could potentially impact threatened and endangered species or their habitats. Prior to conducting the site visits, Stantec reviewed the U.S. Fish and Wildlife Service (USFWS) Ohio Ecological Services Field Office website (USFWS 2018) to determine which federally listed threatened and/or endangered species are known to occur, or potentially occur in Hancock County.

Based on review of the USFWS Ohio Ecological Services Field Office website (USFWS 2018), the USFWS lists the Indiana bat (*Myotis sodalis*; federally endangered), northern long-eared bat (*Myotis septentrionalis*; federally threatened), Clubshell (*Pleurobema clava*; federally endangered), and Rayed Bean (*Villosa fabalis*; federally endangered) as occurring in, or having the potential to occur within Hancock County.

In addition to the above federally listed species, the Ohio Department of Natural Resources Division of Wildlife (ODNR) (ODNR 2020) lists the, northern harrier (*Circus hudsonius* – state threatened), western banded killifish (*Fundulus diaphanus menona*; state endangered), plains clubtail (*Gomphus externus*; state endangered), least bittern (*Ixobrychus exilis* – state threatened), black-crowned night-heron (*Nycticroax nycticroax* – state threatened), fawnsfoot (*Truncilla donaciformis* – state threatened), purple lilliput (*Toxolasma lividus*; state endangered), black sandshell (*Ligumia recta*; state threatened), pondhorn (*Uniomerus tetralasmus*; state threatened), and Kirtland's snake (*Clonophis kirtlandii*; state threatened) as occurring in, or having the potential to occur within Hancock County.

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Stantec biologists documented potentially suitable foraging and summer roosting habitat for the Indiana bat and northern long-eared bat within the Project area. One potentially suitable summer roost tree was observed within the Project area. Additionally, the Blanchard River (Stream 1) provides potentially suitable habitat for listed mussel species. No wetlands or other waterbodies were observed within the Project area.

State and federally listed species in Ohio are protected under the Endangered Species Act (ESA) and regulated by the ODNR and USFWS respectively. As part of the Clean Water Act (CWA) Section 404 permitting process, impacts to Waters of the United States (WOTUS) require compliance with Section 7 of the ESA. Due to the proposed construction of two riffle structures within the Blanchard River (Stream 1), further consultation with the USFWS and ODNR is likely necessary.

This report presents the findings of threatened and endangered species habitat assessment field surveys conducted by Stantec within the Project area.

1.0 INTRODUCTION

On the behalf of Hancock County and the Maumee Watershed Conservancy District (MWCD, “the client”), Stantec was tasked with reviewing existing data associated with analysis completed by the USACE, Buffalo District regarding the recommendation of a floodplain bench along the Blanchard River in search of potential alternative solutions to reduce the risk of overbank flooding from the Blanchard River and its tributaries. This area is described in the *Western Lake Erie Basin (WLEB) Blanchard River Watershed Study, Draft Detailed Project Report/Environmental Impact Statement* (USACE Draft EIS, April 2015). As part of the HCFRR Program, Stantec’s efforts thus far include the recommendation for hydraulic improvements along the Blanchard River in the City of Findlay.

Stantec conducted a wetland and waterbody delineation study and habitat assessment surveys for potential federally listed and state-listed threatened and endangered species habitats within the Project area on July 22, 2020 (Figure 1, Appendix A). The dominant habitats and land uses within the Project area consisted of mixed early successional/second growth riparian forest, industrial, and maintained lawn habitats. The locations of habitats and land uses identified within the Project area are shown on Figure 2 in Appendix A.

As part of the continued assistance to Hancock County and MWCD to support the HCFRR Program, Stantec was retained by MCWD to review available information and conduct a threatened and endangered species habitat assessment within the Project area,. A threatened and endangered species habitat assessment was conducted by Stantec on July 22, 2020 within the Project area to determine if the proposed work could potentially impact threatened and endangered species or their habitats. Prior to conducting the site visits, Stantec reviewed the U.S. Fish and Wildlife Service (USFWS) Ohio Ecological Services Field Office website (USFWS 2018) to determine which federally listed threatened and/or endangered species are known to occur, or potentially occur in Hancock County.

This report presents those findings from the threatened and endangered species habitat assessment field surveys performed on July 22, 2020.

2.0 METHODS

The objective of the habitat assessment field surveys was to determine the presence or absence of potentially suitable habitat within the Project area for federally listed and State-listed threatened or endangered species listed by the USFWS and ODNR as occurring in, or having the potential to occur within, Hancock County, respectively. Prior to conducting the surveys, Stantec reviewed the USFWS Ohio Ecological Services Field Office website (USFWS 2018) to determine which federally listed threatened and/or endangered species are known to occur, or potentially occur, in Hancock County.

Stantec documented the existing habitats and land uses within the Project area and recorded dominant plant species occurring within each habitat and land use type. The locations of habitats and land uses identified by Stantec within the Project area are shown on Figure 2. Additionally, Stantec biologists took representative photographs of the existing habitats and land uses found within the Project area and these photographs are provided in Appendix C.

3.0 PROJECT BACKGROUND

3.1 PHYSIOLOGY

The Project area lies within the Eastern Corn Belt Plains ecoregion (OEPA 2008). The Eastern Corn Belt Plains ecoregion is primarily made up of rolling till plains with local end moraines. It has lighter colored soils than that of the Central Corn Belt Plains ecoregion, loamier and better drained soils than that of the Huron/Erie Lake Plains ecoregion, and richer soils than the Erie/Ontario Drift and Lake Plain ecoregion. However, the soils are not as dissected or leached as much as the pre-Wisconsinan till area located in the southern part of this ecoregion. Originally, natural tree cover was greater than the Central Belt Plains ecoregion. Beech forests were common on Wisconsinan soils while beech forests and elm-ash swamp forests dominated the wetter pre-Wisconsinan soils. Today, extensive corn, soybean, and livestock production occurs and has affected stream chemistry and turbidity.

3.2 HYDROLOGY

The Project is located within the Howard Run-Blanchard River watershed (12-Digit Hydrologic Unit Code [HUC] 041000080304). General flow of surface water in the surrounding area is south to the Blanchard River and eventually to the Auglaize River in Putnam County, Ohio. Stantec identified one stream (Blanchard River) within the Project area. In general, all surface water within the Project area flows south via surface flow to the Blanchard River and then west out of the Project area. No impacts to wetlands are expected to occur and no work below the OHWM of the Blanchard River (Stream 1) is proposed.

4.0 SITE OBSERVATIONS AND RESULTS OF DOCUMENT REVIEW

The Project area was evaluated by Stantec biologists on July 22, 2020, in order to document existing habitat conditions. Each type of habitat identified within the Project area was qualitatively evaluated for its potential to be suitable habitat for the Indiana bat (*Myotis sodalis*; federally endangered), northern long-eared bat (*Myotis septentrionalis*; federally threatened), clubshell (*Pleurobema clava*; federally endangered), and rayed bean (*Villosa fabalis*; federally endangered). All of these species were listed by the USFWS (2018) as occurring in, or potentially occurring within, Hancock County. Existing habitats and land uses were documented and the dominant plant species within those habitats were recorded to further evaluate the existing conditions present within the Project area. Dominant habitats and land uses within the Project area consisted of maintained lawn, mixed early successional/second growth riparian forest, and industrial habitats.

4.1 PLANT COMMUNITIES

The vegetation communities and land uses present within the Project area are described below and representative photographs of each of these habitats and land uses are provided in Appendix C. Table 1 below lists the habitat types and land uses observed and provides the approximate acreages of each habitat type and land use identified within the Project area.

Maintained Lawn

Dominant plant species found within the maintained lawn habitat consisted of: Kentucky bluegrass (*Poa pratensis*), tall fescue (*Schedonorus arundinaceus*). Timothy grass (*Phleum pratense*), dandelion (*Taraxacum officinalis*), white clover (*Trifolium repens*), red clover (*Trifolim pratense*), alsike clover (*Trifolium hybridum*), and broadleaf plantain (*Plantago major*).

Mixed Early Successional/Second Growth Riparian Forest

Dominant plant species found within the mixed early successional/second growth riparian forest habitats consisted of: Amur honeysuckle, green ash (*Fraxinus pennsylvanica*), Osage orange (*Maclura pomifera*), black walnut (*Juglans nigra*), eastern cottonwood, poison ivy (*Toxicodendron radicans*), American sycamore, riverbank wildrye (*Elymus riparius*), honeylocust (*Gleditsia triacanthos*), Virginia wildrye (*Elymus virginicus*), common hackberry (*Celtis occidentalis*), American elm (*Ulmus americana*), silver maple (*Acer saccharinum*), boxelder (*Acer negundo*), switchgrass, poison hemlock (*Conium maculatum*), American pokeweed (*Phytolacca americana*) and wingstem (*Verbesina alternifolia*).

Industrial

Industrial habitats within the Project area were dominated by disturbance-tolerant species such as Amur honeysuckle, lesser trefoil (*Trifolium dubium*), bird's-foot trefoil (*Lotus corniculatus*), alsike clover, hairy crabgrass (*Digitaria sanguinalis*), and common wormwood (*Artemisia vulgaris*).

Table 1. Summary of Habitat Types within the Eagle Creek Dry-Storage Project Area

Habitat/Land Use Type	**Approximate Acreage within Project Area**
Mixed Early Successional/Second Growth Riparian Forest	1.53
Maintained Lawn	9.40
Industrial	22.07
Total	**33.0**

5.0 FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES

5.1 INDIANA BAT

5.1.1 Species Status

Because of the Indiana bat's strong resemblance to the little brown bat, it was not described as a separate species until 1928 (Miller and Allen 1928) from a specimen collected in Wyandotte Cave, Crawford County, Indiana. The Indiana bat can be distinguished from other larger *Myotis*, particularly the little brown bat, by its short, inconspicuous toe hairs, by its smaller foot (9 mm instead of 10 mm long), by its keeled calcar, by its more uniform colored fur, and its pinkish colored pug-nose (Whitaker and Hamilton 1998). Albino and partially white bats are rarely encountered but may occur in large hibernacula (Brack et al. 2005). Since its description as a separate species, the Indiana bat has suffered drastic population declines, primarily from human-induced alterations of winter habitat. Commercialization and mining of "saltpeter" at significant caves have created environments, especially warmer temperatures, which are unsuitable or marginal for hibernating Indiana bats. Most recently the Indiana bat along with other hibernating bats has declined drastically throughout their range from a cold-loving fungus, *Pseudogymnoascus destructans*, also known as white-nose syndrome (WNS).

The USFWS listed the Indiana bat as an endangered species on March 11, 1967. However, the bat did not receive any protection until the ESA was instated in 1973 (Public Law 93-205). Several years following its listing, an Indiana bat recovery plan was developed by biologists (i.e., the recovery team), which outlined habitat requirements, critical habitat, potential causes for declines, and recovery objectives. The recovery plan was reviewed and published by the USFWS in 1983. On April 16, 2007 the notice of availability for review and comment on an updated "Draft Indiana Bat Recovery Plan, First Revision and Draft Survey Protocol" was published in the Federal Register (72 FR 19015 – 19016). This updated document provides an extensive literature review of historical and recent species information, and the revised plan lists three new fundamental recovery objectives. These objectives are to: (1) obtain permanent protection of 80 percent of Priority One hibernacula, (2) maintain a minimum overall population equal to the 2005 estimate (457,000 individuals), and (3) document a positive population growth rate over five sequential survey periods. However, the plan says, "if identified research on summer habitat characteristics and requirements indicates the quality and quantity of maternity habitat is threatening recovery of the species, the Service will amend these objectives" (USFWS 2007).

5.1.2 Distribution and Population Status

The range of the Indiana bat includes much of the eastern United States. It occurs from Iowa, Oklahoma and Wisconsin, northeast to Vermont, and south to northwestern Florida and northern Arkansas (Barbour and Davis 1969). The majority of the wintering population occurs within the limestone cave region of Indiana, Kentucky, and Missouri. Large colonies have been found in some abandoned underground mines in Illinois, Ohio, Missouri, New Jersey, and New York. According to the USFWS (1999), more than 85

percent of the range-wide population is found in nine Priority One hibernacula. Indiana, Kentucky, and Missouri, each contain three Priority One hibernacula. Due to sampling methods and inaccurate counts, Clawson (2002) determined that Dixon Cave in Kentucky and Pilot Knob Mine in Missouri should no longer be considered Priority One sites. In the 2007 revised Indiana bat recovery plan, Priority One hibernacula were changed and now includes 16 total sites with seven in Indiana, two each in Kentucky, Missouri, and New York, and one each in Illinois, Tennessee, and West Virginia. As of 2019 surveying period, 537,297 Indiana bats were estimated range-wide, and hibernacula that contained these occurred in 17 states, including Alabama, Arkansas, Georgia, Illinois, Indiana, Kentucky, Michigan, Missouri, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Tennessee, Vermont, Virginia, and West Virginia (USFWS 2019). Currently, critical winter habitat is established and includes eleven caves and two non-coal mines, including six in Missouri, two each in Indiana and Kentucky; and one each in Illinois, Tennessee, and West Virginia (USFWS 2007). As of the 2019 population estimates, Ohio hibernacula contains only 2,890 Indiana bats which have shown a 62 percent decline since the arrival of WNS in North America during the winter of 2007 (USFWS 2019).

Summer distribution of the Indiana bat occurs throughout a wider geographic area than winter distribution. The core summer range includes southern Iowa, northern Missouri, northern Illinois, northern Indiana, southern Michigan, and western Ohio. However, population distribution during summer is poorly known because of wide gaps between the known maternity colonies and unknown amount of movement between roost sites. Summer colonies of Indiana bats occur as far north as Michigan, New York, and Vermont, and as far south as Alabama, Missouri, and Tennessee, and as far west as Iowa. Britzke et al. (2003) found that Indiana bat maternity colonies were less frequently encountered in mountainous terrain and were usually smaller in size. Britzke et al. (2003) found three maternity colony sites in the mountains of western North Carolina and eastern Tennessee but failed to relocate the colonies at the same roost sites the following year. In non-mountainous terrain in Michigan and Vermont, researchers have been tracking the same colonies for more than five consecutive years and the bats seem to show some degree of site fidelity to a given area (Kurta 2004; Scott Darling, unpublished data), and many of these colonies often exceed several hundred individuals.

5.1.3 Life History

The Indiana bat hibernates from October/early November to middle of April with emergence dependent upon location and weather. Typically, the Indiana bat forms dense clusters on cave and mine ceilings and walls where winter temperatures are 3.0 – 7.2^0 C (37.4 – 44.9^0 F). Sites containing populations where temperatures are outside this range have shown population declines (Tuttle and Kennedy 2002). Stable low temperatures allow Indiana bats to maintain a low rate of metabolism and conserve fat reserves through the winter until spring emergence when outside temperatures have increased and insects (food) are more abundant (Humphrey 1978, Richter et al. 1993). As with cave temperature, relative humidity in the cave also determines hibernation site suitability for Indiana bats. According to Hall (1962), Humphrey (1978), and LaVal et al. (1976), humidity at roost sites during hibernation is usually above 74 percent, but below saturation. Cave configurations determines internal environments and larger more complex cave systems having multiple entrances are more likely to provide suitable habitat for the Indiana bat (Tuttle and Stevenson 1978, LaVal and LaVal 1980). Depending on cave environments, the Indiana bat may hibernate

near the entrance where cool air seeps in from outside or deeper in the cave where cold air is trapped in a sink.

Although some bats may awaken during the winter and exit hibernacula early, the majority of individuals start exiting hibernacula early to mid-April. Female Indiana bats leave the hibernacula earlier in spring than males. Peak departure from hibernacula is in late April through early May. This period is often referred to as spring staging. Some males may remain near the hibernacula throughout the year, move short distances to other caves or mines, or migrate to distant areas (Whitaker and Brack 2002). When female Indiana bats emerge, they may migrate only a few miles, or up to 465 km (288 miles) from their hibernacula to summer habitat. Winhold et al. (2005) reported a female traveling 465 km (289 miles) from a summer colony near Norvell, Michigan to a hibernaculum near Frenchburg, Kentucky. Conversely, Indiana bats tracked from an abandoned mine in New York only flew between nine and 14.6 (9 miles) to 40.0 km (24 miles) from the foothills of the Adirondack Mountains to roost trees scattered throughout the Lake Champlain Valley (Britzke et al. 2006). Based on a combination of aerial and ground tracking, Indiana bats tracked from a hibernaculum in Pennsylvania flew almost a straight line to their roost trees 135 km (83 miles) and 148 km (92 miles) away in Maryland (Butchkoski et al. 2006).

Few studies have focused on spring roost trees of the Indiana bat. Britzke et al. (2006) found female bats roosting primarily in live shagbark hickory (*Carya ovata*) and roost changing was much lower than during the summer. Live shagbark hickory provides more shelter to roosting bats than does sloughing bark on dead trees. Such differences may have been associated with unpredictable spring weather in the northeast because summer bats and males during the spring, switch roosts every single day to three days (Menzel et al. 2001; Gumbert et al. 2002; Kurta et al. 1996, 2002). According to Britzke et al. (2006), spring roost trees used in Lake Champlain Valley were similar in structure (e.g., sloughing bark, solar exposure) to trees used throughout the species range. Trees used during the spring included shagbark hickory, American elm, quaking aspen (*Populus tremuloides*), sugar maple, black locust (*Robinia pseudoacacia*), white ash, American beech (*Fagus grandifolia*), yellow birch (*Betula alleghaniensis*), eastern hemlock (*Tsuga canadensis*), and red maple.

Based on Britzke et al.'s (2006) work, some of the spring roosting activity occurs within the same area where maternity roosts have been found. Female Indiana bats form maternity roosts under exfoliating bark of dead, dying and live trees in both upland and riparian habitats. A single maternity colony typically consists of 25 to 100 bats but can contain as many as 384 individuals (Kiser et al. 2002). Over 30 species of trees have been documented as maternity roosts, but 87 percent of these are various ashes (*Fraxinus* spp.), elms (*Ulmus* spp.), hickories (*Carya* spp.), maples (*Acer* spp.), poplars (*Populus* spp.), and oaks (Kurta 2004). Most trees used by reproductive females are deciduous, but eastern hemlock and pitch pine (*Pinus rigida*) have been used in western North Carolina and eastern Tennessee, and white pine (*P. strobus*) has been used in Vermont (Britzke et al. 2003, J. Kiser, pers. obs. 2004). Near the southern edge of the species maternity range in Alabama and Georgia yellow pines, such as shortleaf pine (*P. echinata*), and loblolly pine (*P. taeda*) are used extensively.

Roost trees used by Indiana bats vary in size. The minimum tree size (dbh) reported for a male roost is 6.4 cm (2.5 inches) (Gumbert 2001) and 11 cm (4.3 inches) for an individual female roost (Britzke 2003). Primary maternity roosts are always found in larger diameter trees usually greater than 22 cm (8.6 inches)

dbh (Kurta 2004). Larger diameter trees provide thermal advantages to reproductive females and their pups and give them more room to move around while locating appropriate temperatures. Females are pregnant when they arrive at maternity roost and fecundity is low, only one pup per year. Pups are normally born in late June and early July and grow quickly, becoming volant between early July and early August.

Indiana bats may travel several miles from day roosts to foraging areas. Gardner et al. (1991) found that individuals from an Illinois maternity colony traveled 4.0 km (2.5 miles) to foraging areas. In fragmented habitat, bats will use hedge rows and other features on the landscape as travel ways between foraging areas and day roosts (Murray and Kurta 2004). Rather than crossing open habitats (e.g., pasture land, open water, agricultural fields) Indiana bats increased their travel distance by 55 percent in Michigan to take advantage of the protective cover of tree-lines (Murray and Kurta 2004). Indiana bats will forage in upland and floodplain forest (Brack 1983; Humphrey 1978; LaVal and LaVal 1980; Gardner et al. 1991; Kiser and Elliott 1996). Indiana bats are opportunistic foragers, feeding on a variety of small insects. The diet of Indiana bats varies between habitats, geographic locations, season, sex, and age of bats (Kurta and Whitaker 1998; Brack and LaVal 1985; Belwood 1979). Sparks and Whitaker (2004) summarized food habit studies conducted over 30 years and determined that Indiana bat's diet consisted primarily of insects belonging to the orders Diptera (flies), Lepidoptera (moths) and Coleoptera (beetles), but when locally abundant, Trichoptera (caddisflies) and Hymenoptera (wasps and ants) may be the predominant food. Several pest species including mosquitoes (Diptera:Culicidae), Asiatic oak weevil (*Cyrtepistomus castaneus*), spotted cucumber beetle (*Diabrotica undecimpunctata*), and Hessian fly (*Mayetoila destructor*) (Sparks and Whitaker 2004; Kurta and Whitaker 1998; Kiser and Elliott 1996) are also consumed by Indiana bats when locally abundant.

Foraging activity is usually interrupted by periods of rest, referred to as night roosting. Most Indiana bats apparently use trees as night roosts (Butchkoski and Hassinger 2002; Murray and Kurta 2004), although they do occasionally utilize bat boxes (Butchkoski and Hassinger 2002), and concrete bridges (Kiser et al. 2002). Night roosting is any time a bat stops flying during the night. The purpose of night roosts is to provide bats a resting place between foraging bouts, promote digestion and energy conservation, provide retreats from predators and inclement weather, provide places to ingest food transported from nearby feeding areas, function as feeding perches for sit-and-wait predators, and serve as a place to promote social interactions and information transfer (Ormsbee et al. 2007).

Indiana bats start arriving at hibernacula during late August and fly around the entrances in an attempt to find mates. This phenomenon is referred to as "swarming" and is typically a multispecies event (Cope and Humphrey 1977). During swarming, Indiana bats day roost under sloughing bark of trees near the cave and travel to the entrance each night (Kiser and Elliott 1996). Roost trees used during autumn range from 11.75 to 66.0 cm (4.6 to 25.9 inches) in diameter at breast height (dbh) and occur primarily on ridge-tops and upper slopes (Kiser and Elliott 1996). As with summer roosts, site fidelity to autumn roosting areas is exhibited by male Indiana bats (Gumbert et al. 2002). Male Indiana bats typically remain active longer during autumn than do females. Once arriving at hibernacula, females may only remain active for a few days where-as males remain active, seeking mates, into late October and early November.

5.1.4 Habitat Assessment Results

No potential Indiana bat hibernacula were found within the Project area. However, suitable foraging habitat and potentially suitable summer roosting habitat for the Indiana bat are present within the Project area. One potentially suitable Indiana bat roost tree (PRT-01) was observed within the Project area. PRT-01 is a dead white ash (*Fraxinus americana*) with a diameter at breast height (DBH) of roughly 15 inches and sloughing bark habitat. The location of PRT-01 was recorded using a handheld sub-meter accuracy Global Positioning System (GPS) survey equipment and is shown on Figure 2 in Appendix A. Representative photographs of the potential Indiana bat roost tree identified within the Project area are provided in Appendix C.

5.2 NORTHERN LONG-EARED BAT

5.2.1 Species Status

The northern long-eared bat is a medium-sized bat in the genus *Myotis*, weighing between 5 to 9 grams (0.2 to 0.3 oz) (Brack et al. 2010). The forearm length has a range of 35 to 39 mm (1.4 to 1.5 in) and the total length, tail included, ranges from 79.2 to 87.8 mm (3.1 to 3.5 in) (Brack et al. 2010; Whitaker and Hamilton 1998). Northern long-eared bats are similar in appearance to other *Myotis* species that inhabit the eastern United States, including eastern small-footed bats (*M. leibii*), Indiana bats, and little brown bats, which it most closely resembles. The northern long-eared bat can be distinguished from these similar species by their distinctly long ears (14 – 18 mm [0.5 – 0.7 in]) and long, sharply pointed tragus (9 – 11 mm [0.3 – 0.4 in]) (USFWS 2013; Brack et al. 2010). When extended normally, the ears of the northern long-eared bat are symmetrical in shape, unlike the asymmetrical look of the little brown bat, and laid forward, the ears of the northern long-eared bat will extend about 4 mm (0.2 in) beyond the nostrils (Brack et al. 2010; Caceres and Barclay 2000; Whitaker and Hamilton 1998), whereas other Myotis species typically have ears that do not extend beyond the nostrils. Other minor differences include non-fluffy and non-glossy fur, as well as a distinct area around the eyes where the fur is thinner, creating a bald look around the eyes. However, the length of the ears on the northern-long eared bat is the most reliable characteristic when identifying this species. The pelage is medium to dark brown on its back and tawny to pale-brown on the ventral side. The ears and wing membranes are dark brown but not black (USFWS 2013; Whitaker and Mumford 2009). Overall, the fur is slightly lighter than that of the little brown, Indiana, and small footed bats.

On 2 October 2013, the USFWS announced a 12-month finding on a petition to list the northern long-eared bat as threatened or endangered under the Endangered Species Act of 1973 (78 FR 61046 – 61080). A 60-day public comment period was opened ending on December 2, 2013. Since then, the public comment period has been reopened and extended three times, for a total of four comment periods totaling 180 days. After careful review of the best available scientific and commercial information, the USFWS determined that listing of the northern long-eared bat was warranted throughout its range.

The status review conducted by the USFWS identified WNS as the primary threat to the northern long-eared bat, although other threats do exist as well including impacts to hibernacula, summer habitat, and during migration (USFWS 2014). An emerging infectious disease, WNS is caused by the fungus, *P.*

destructans, and is responsible for unprecedented mortality in some hibernating insectivorous bats in the northeastern U. S., including dramatic and rapid population declines in northern long-eared bat populations of up to 99 percent from pre-WNS levels. WNS is spreading rapidly throughout the eastern U.S. and is currently spreading through the Midwest. While some data suggests that northern long-eared bats may have been on the decline prior to the onset of WNS (Ingersoll et al. 2013), there is limited data to support this theory. The fungus associated with WNS has been identified or suspected in approximately 18 counties in Ohio (www.whitenosesyndrome.org).

On January 16, 2015, the USFWS proposed a rule change to list the northern long-eared bat as threatened under the ESA. On April 2, 2015, the USFWS determined the northern long-eared bat should be listed as threatened under the Endangered Species Act and listed it under the Section 4d provision (80 FR 17974 – 18033). Section 4(d) of the ESA provides the USFWS the discretion to issue regulations necessary and advisable to provide for conservation of the species. The final ruling to list the northern long-eared bat took effect on May 4, 2015.

5.2.2 Distribution and Population Status

The northern long-eared bat is found throughout the eastern and Midwestern U.S. and southern Canada. In the U.S., it ranges from Maine south to central North Carolina along the Atlantic coast, extending west into eastern Oklahoma and north into North Dakota and eastern Wyoming and Montana. In the south, the northern long-eared bat extends into parts of Georgia, Alabama, Mississippi, and Louisiana (USFWS 2014). Historically, the eastern portion of the northern long-eared bats range has held its greatest abundance (Caceres and Barclay 2000), and numbers in the southern and western portion of the bats range are considered naturally low (USDA 2006). In Ohio, the northern long-eared bat is either known from or thought to likely occur in every county in the state. Until the appearance of WNS, the species was frequently captured in eastern portions of Ohio, especially throughout the counties where gas and oil development occur and where the Wayne National Forest (WNF) is located (James Kiser, unpublished data). Survey efforts for the WNF during the late 1990's and early 2000's resulted in the capture of 100's of northern long-eared bats throughout forested habitats, especially over ridgetop ponds and water-filled road-ruts. More recently, follow up surveys at some of the best capture sites from previous surveys on the WNF have captured few northern long eared bats (Katrina Schultes, WNF Biologist, pers. comm., 2019).

5.2.3 Life History

Northern long-eared bats use a wide variety of forested habitats for roosting, foraging and traveling, and may also utilize some adjacent and interspersed non-forested habitat such as emergent wetlands and edges of fields. This species has also been found roosting in structures like barns and sheds (particularly when suitable tree roosts are unavailable). The bats emerge at dusk to forage in upland and lowland woodlots and tree-lined corridors, feeding on insects, which they catch while in flight using echolocation. This species also feeds by gleaning insects from vegetation and water surfaces (USFWS 2014).

Roosting habitat includes forested areas with live trees and/or snags with a dbh of at least 3 in (7.6 cm) with exfoliating bark, cracks, crevices and/or other cavities. Trees are considered suitable if they meet those requirements and are located within 305 m (1,000 ft) of the nearest suitable roost tree, woodlot, or

wooded fencerow (USFWS 2014). Maternity habitat is defined as suitable summer habitat that is used by juveniles and reproductive females.

Winter habitat includes underground caves and cave-like structures such as abandoned or active mines and railroad tunnels. These hibernacula typically have high humidity, minimal air current, large passages with cracks and crevices for roosting, and maintain a relatively cool temperature 32 – 48 degrees Fahrenheit (0 - 9 degrees Celsius) (USFWS 2014).

Northern long-eared bats migrate between their winter hibernacula and summer habitat, typically between mid-March and mid-May in the spring, and mid-August and mid-October in the fall. They are considered a short-distance migrant (typically 64.4 – 80.5 km [40 - 50 mi]), although their known migratory distances can vary greatly between 8 – 270 km (5 and 168 mi) (USFWS 2014).

5.2.4 Habitat Assessment Results

No potential northern long-eared bat hibernacula were found within the Project area. However, suitable foraging habitat and potentially suitable summer roosting habitat for the northern long-eared bat are present within the Project area. One potentially suitable northern long-eared bat roost tree (PRT-01) was observed within the Project area. PRT-01 is a dead white ash (*Fraxinus americana*) with a diameter at breast height (DBH) of roughly 15 inches and sloughing bark habitat. The location of PRT-01 was recorded using a handheld sub-meter accuracy GPS survey equipment and is shown on Figure 2 in Appendix A. Representative photographs of the potential northern long-eared bat roost tree identified within the Project area are provided in Appendix C.

5.3 CLUBSHELL

5.3.1 Species Status

The USFWS listed the clubshell as endangered on January 22, 1993. It was later listed by the state of Ohio as endangered in 2009, largely due to pollution from agricultural run-off and industrial wastes, and extensive impoundments for navigation (USFWS 1994; Watters et al. 2009).

5.3.2 Distribution and Population Status

The clubshell occurs in medium to small rivers and streams, containing clean, coarse sand and cobble substrates (USFWS 1994). The clubshell is usually found within the current, where it may live several inches underneath the surface. It is most common in the downstream ends of riffles and islands (Watters et al. 2009).

The clubshell is mostly considered an Ohio River system species, including the Tennessee, Cumberland, Kanawha, and Wabash river drainages. However, it is also found within the Maumee River system of Lake Erie. Although historically the clubshell was originally described as occurring within Lake Erie, only one record of its occurrence there has been found (Watters et al. 2009).

The largest extant population of the clubshell is located in the Tippecanoe River, Indiana (Cummings and Berlocher 1990; Cummings et al. 1992; ESI 1992, 1993). Surveys by Ecological Specialists, Inc. (ESI) in 1992 and 1993 found living individuals at nine sites from the mouth to the uppermost reach, a distance of over 150 miles. Fresh dead individuals were found at an additional ten sites. In all, living or fresh dead specimens were found in 63% of the sites studied, although weathered shells occurred at 97% of the sites. The ages of individuals ranged from three to 17 years, indicating that this population probably is reproducing. Muskrat predation seemed to be a major cause of death at many sites, based on numerous shells in middens (USFWS 1994).

5.3.3 Life History

Clubshell eggs appear in May and the glochidia develop in June and July (Ortmann 1919). In Ohio, females release fragile, white, non-elastic conglutinates, and are barren by the end of June (Watters et al. 2009).

The clubshell is considered a short-term brooder. Fishes reported to serve as gllochidial hosts of the clubshell in laboratory trials include the central stoneroller (*Campostoma anomalum*), striped shiner (*Luxilus chrysocephalus*), logperch (*Percina caprodes*), and the blackside darter (*Percina maculata*) (Williams et. al. 2008; Watters et al. 2009).

5.3.4 Habitat Assessment Results

No potentially suitable habitat for the clubshell was documented within the Project area due to heavy sedimentation and historic impoundment of the Blanchard River. However, due to the proposed construction of two riffle structures within the Blanchard River (Stream 1) of the Project area, further coordination with the USFWS and ODNR is likely necessary.

5.4 RAYED BEAN

5.4.1 Species Status

The USFWS listed the rayed bean as threatened on March 15, 2012, largely due to rapid population declines. Rayed bean-occupied waterways have declined by 73 percent across the range of the species. Reduced population sizes have occurred due to point and nonpoint source pollution, sedimentation, and changes in streambed structure (USFWS 2012).

5.4.2 Distribution and Population Status

The rayed bean was historically found across the midwestern and eastern United States, reaching north into Ontario, Canada (USFWS 2012). The rayed bean is known from the upper Mississippi River and upper Tennessee River watersheds and within the Great Lakes drainages (Watters et al. 2009). With records showing presence in at least 115 streams and lakes, the species is now only known from 31 streams and one lake, a 73 percent reduction in occupied waterways. The species has been extirpated from Illinois, Kentucky, and Virginia. Reintroductions have restored the rayed bean to Tennessee and West Virginia after extirpation (USFWS 2012).

5.4.3 Life History

The rayed bean is a small (rarely to 1 inch) freshwater mussel species within the genus *Villosa*. This species' shell is smooth and green, yellow-green, or brown with dark, wavy rays. Additionally, this species is sexually dimorphic. Males are elongated while females tend to be smaller and more elliptical (USFWS 2012).

Reproduction occurs when a female's fertilized egg develops into a microscopic-larvae called glochidia. Through the use of lures, host fish bite the gravid female and the glochidia are released into the host fish's gills. The glochidia attach to the host fish and continue to develop for approximately 30 more days. After development, the glochidia will drop off of the host and continue to develop in the substrates of the waterway.

5.4.4 Habitat

Habitat includes gravel or sandy substrates, especially in areas of thick roots of aquatic plants and increased substrate stability (Butler 2002; Parmalee and Bogan 1998). The rayed bean can be associated with shoal or riffle areas, and in shallow, wave-washed areas of glacial lakes. It is generally found in smaller, headwater creeks, but sometimes occurs in larger rivers and open waterbodies. It can occur in shallow riffles or in lakes with water depths up to four feet. It has been found in riffles, generally in vegetation, and deeply buried in sand and gravel bound together by roots (Parmalee and Bogan 1998).

5.4.5 Habitat Assessment Results

No potentially suitable habitat for the rayed bean was documented within the Project area due to heavy sedimentation and historic impoundment of the Blanchard River. However, due to the proposed construction of two riffle structures within the Blanchard River (Stream 1) of the Project area, further coordination with the USFWS and ODNR is likely necessary.

5.5 BALD EAGLE

5.5.1 Species Status

The bald eagle is the only species of sea eagle native to North America. It was listed as federally endangered on March 11, 1967 and after monitoring of the species showed significant increases in reproduction and distribution through 1994, it was reclassified to threatened on July 12, 1995 (Federal Register 2006). On July 9, 2007, after continuous monitoring and protection, it was determined that the bald eagle had recovered and it was removed (delisted) from the federal list of threatened and endangered wildlife (Federal Register 2007). Although they are delisted, the bald eagle is still protected under the Bald and Golden Eagle Protection Act, the Migratory Bird Treaty Act, and the Lacey Act. As part of the de-listing, the USFWS has developed a de-listing monitoring plan where states will monitor the status of the bald eagle by collecting data on occupied nests for the next 20 years with sampling held every five years which started in 2009. The State of Ohio currently does not have a special status assigned to the bald eagle.

The major declines in populations resulted from loss of habitat, shooting, trapping, and poisoning from environmental contaminants (USFWS 1983). The first declines occurred in the 1800s when eagles and their prey were recreationally hunted and trapped. Carrion treated with poison was used as bait to kill livestock predators and ultimately killed many eagles as well (Federal Register 2006). From the 1950s through mid-1970s, the use of dichloro-diphenyl-trichloroethane (DDT) and other pesticides dramatically reduced bald eagle productivity and reproduction. A breakdown product of DDT, known as DDE, accumulated in the fatty tissue of adult female bald eagles and impaired calcium metabolism necessary for normal egg formation which caused thinning of the eggshell. Many eggs broke during incubation or suffered embryonic mortality which led to the massive decline in the species (Federal Register 2006).

5.5.2 Distribution and Population Status

Historically the bald eagle was widespread across much of the United States and Canada (Vuilleumier 2009). Before the bald eagle was listed as an endangered species under the authority of the ESA, the population count of bald eagles in the lower 48 states was approximately 487 breeding pairs in 1963. As of 2007, the population in the lower 48 states had increased from 487 breeding pairs to 9,789 breeding pairs (Federal Register 2007). The recovery of the bald eagle was due to habitat protection and management plans and reduction of the use of pesticides (DDT) occurring in the environment (Federal Register 2007).

By 1979, bald eagles in Ohio had declined to just four breeding pairs (McCormac and Kennedy 2004). In 2004, it was estimated that there were 125 breeding pairs in Ohio (Federal Register 2007) and 352 wintering birds (McCormac and Kennedy 2004). According to the USFWS response letter received for the Project dated September 19, 2019, a known bald eagle nest is located approximately 280 meters (918 feet) due east of the northeast corner of the Project area (Appendix B).

5.5.3 Life History

The bald eagle is a large, long lived bird of prey that prefers habitat near large lakes, rivers, and along seacoasts. The average lifespan ranges from 28 to 30 years under normal circumstances. Adults have dark brown bodies with white heads and white tails; the adult plumage is not acquired until age four at the earliest after undergoing a series of color changes (USFWS 1983). It feeds primarily on carrion, especially fish, and also eats birds, mammals, reptiles; and often steals fish from osprey (Vuilleumier 2009). Nests are usually built in large trees that may be far from the water and are reused for many years (McCormac and Kennedy 2004).

The entire breeding cycle from initial activity at the nest through the period of fledgling dependency is about six months (USFWS 1983). Adults tend to use the same breeding area each year producing one to three eggs per each nesting attempt. Egg laying begins in late September in southern latitudes and may extend to May in northern latitudes. The time between egg laying and fledging is approximately four months (USFWS 1983). Some bald eagles stay in the vicinity of breeding areas while some migrate up to hundreds of miles to their wintering grounds looking for readily available food supply (Federal Register 2006).

5.5.4 Habitat Assessment Results

Bald eagles are range wide species, and found throughout the U.S. Habitat is throughout the surrounding areas in the vicinity of the Project within forested woodlots and forested riparian areas adjacent to the Blanchard River and other large waterbodies. Additionally, known bald eagle nests occur along the Blanchard River within Hancock County, Ohio. However, no nests were observed within or in proximity to the Project area. Therefore, the Project is unlikely to result in impacts to this species.

6.0 STATE-LISTED THREATENED AND ENDANGERED SPECIES

Table 2. Summary of Potential Ohio State-Listed Species within the Additional Hydraulic Improvements Project Area

Common Name	Scientific Name	State Status[1]	Known within one mile of the Project Area?[2]	Habitat Preference	Potential Habitat Observed in Project Area	Impact Assessment
Northern Harrier	*Circus Hudsonius*	E	No	Northern Harriers breed in wide-open habitats ranging from Arctic tundra to prairie grasslands to fields and marshes. Their nests are concealed on the ground in grasses or wetland vegetation. In migration and winter, harriers typically move south away from areas that receive heavy snow cover, ending up in open habitats similar to those in which they breed (NatureServe, 2020).	No	No potentially suitable habitat was observed within the Project area. Therefore, no impacts to this species are anticipated.
Western Banded Killifish	*Fundulus diaphanus menona*	E	No	This species is found in areas with an abundance of rooted aquatic vegetation, clear waters, and with substrates of clean sand or organic debris free of silt. They were historically found in natural glacial lakes and slow-moving streams in the northern part of the state. Today they are limited to some tributaries of the Portage River system in Wood	No	Due to the lack of rooted aquatic vegetation observed within the perennial stream and the abundance of agricultural runoff affecting the larger stream within the Project area, no potentially suitable habitat was observed. Therefore, no impacts to this species are anticipated.

				County and in Miller Bluehole of Sandusky County (ODNR 2019).		
Plains Clubtail	*Gomphus externus*	E	No	This species prefers sandy to muddy streams and rivers with some current and grassy or wooded banks (MNHP 2019).	No	No potentially suitable habitat was observed within the Project area. Therefore, no impacts to this species are anticipated.
Purple Lilliput	*Toxolasma lividus*	E	No	This species inhabits fine-particle substrates and also sand, gravel, or cobbles and boulders in riffles or flats immediately above riffles. This species is reported from the headwaters of small to medium sized rivers (NatureServe, 2020).	Yes	Potentially suitable habitat for this species was observed within the Project area. Further coordination with the ODNR is most likely necessary to avoid impacts to this species.
Least Bittern	*Ixobrychus exilis*	T	No	All emergent vegetation in marshes, primarily freshwater, less commonly in coastal brackish marshes and mangrove swamps. Prefers marshes with scattered bushes or other woody growth. In the northeastern U.S., breeds mainly in wetlands along lakes, rivers, and estuaries on the coastal plain (NatureServe, 2020).	No	No potentially suitable habitat was observed within the Project area. Therefore, no impacts to this species are anticipated.
Black-Crowned Night-Heron	*Nycticorax nycticorax*	T	No	Marshes, swamps, wooded streams, mangroves, shores of lakes, ponds, lagoons; salt water, brackish, and freshwater situations. Roosts by day in mangroves or swampy woodland. Eggs are laid in a platform nest in groves of trees	Yes	Potentially suitable roosting habitat was observed within the Project area. However, no heron roosts were observed during field visits. Therefore, no impacts to this species are anticipated.

				near coastal marshes or on marine islands, swamps, marsh vegetation, clumps of grass on dry ground, orchards, and in many other situations. Nests usually with other heron species (NatureServe, 2020).		
Black Sandshell	*Ligumia recta*	T	No	This species is typically found in medium-sized to large rivers in locations with strong current and substrates of coarse sand and gravel with cobbles in water depths from several inches to six feet or more (NatureServe, 2020).	Yes	Potentially suitable habitat for this species was observed within the Project area. Further coordination with the ODNR is most likely necessary to avoid impacts to this species.
Fawnsfoot	*Truncilla donaciformis*	T	No	This species occurs in both large and medium-sized rivers at normal depths varying from less than three feet up to 15 to 18 feet in big rivers such as the Tennessee. A substrate of either sand or mud is suitable and although it is typically found in moderate current, it can adapt to a lake or embayment environment lacking current (NatureServe, 2020)	Yes	Potentially suitable habitat for this species was observed within the Project area. Further coordination with the ODNR is most likely necessary to avoid impacts to this species.
Pondhorn	*Uniomerus tetralasmus*	T	No	This species typically inhabits the quiet or slow-moving, shallow waters of sloughs, borrow pits, ponds, ditches, and meandering streams. It is tolerant of poor water conditions and can be found well buried in	Yes	Potentially suitable habitat for this species was observed within the Project area. Further coordination with the ODNR is most likely necessary to avoid impacts to this species.

				a substrate of fine silt and/or mud (NatureServe, 2020).		
Kirtland's Snake	*Clonophis kirtlandii*	T	No	Kirtland's snake ranges throughout the glaciated western half of Ohio and into a few glacial outwash-filled valleys in southwestern Ohio. Its secretive nature and marked preference for wet meadows make it difficult to find. In addition to natural areas, Kirtland's snakes may also be found in the urban areas of Cincinnati, Dayton, and Toledo. (ODNR 2019).	Yes	Potentially suitable habitat was observed within the Project area. However, this species is not known recently to occur in Hancock County and was last observed in Hancock County in 1960 (ODNR 2016). Therefore, it is likely that the Project will not adversely affect this species.
[1] E = Endangered; T = Threatened [2] According to ODNR Office of Real Estate and ONHP (Appendix B).						

7.0 CONCLUSION

Stantec conducted a habitat assessment for potentially suitable species habitat for federal and state-listed species within the Project area on July 22, 2020. As stated, the Project area primarily consists of mixed early successional/second growth riparian forest, industrial, and maintained lawn habitats. In conjunction with the threatened and endangered species habitat assessment, Stantec conducted a wetland and waterbody delineation study for the Project. During the wetland and waterbody delineation study Stantec identified one perennial stream (Stream 1, Blanchard River) within the Project area. No wetlands or other waterbodies were identified within the Project area. Details regarding the wetland and waterbody delineation can be found in the *Additional Hydraulic Improvements Project, Wetland and Waterbody Delineation Report* (Stantec 2020) dated September 18, 2020.

Due to the proposed addition of two riffle structures within the Blanchard River (Stream 1) as part of the Project, MWCD would be required to receive authorization for the Project from the USACE under Section 404 prior to initiation of any construction activities. As part of the Section 401/04 CWA permitting process, MWCD would be required to initiate consultation with USFWS. Additionally, further coordination with the USFWS and ODNR to avoid accidental take of any listed species would likely be required.

Based on review of the USFWS Ohio Ecological Services Field Office website (USFWS 2018), the USFWS lists the Indiana bat, northern long-eared bat, clubshell, rayed bean, and bald eagle as occurring in, or having the potential to occur within, Hancock County. In addition to the listed federally protected species, the ODNR Division of Wildlife (ODNR 2020) lists the following state protected species as occurring or having the potential to occur within Hancock County: northern harrier, western banded killifish, plains clubtail, least bittern, black-crowned night-heron , fawnsfoot , purple lilliput , black sandshell , pondhorn, and Kirtland's snake.

During the field surveys, Stantec biologists documented potentially suitable foraging and summer roosting habitat for the Indiana bat and northern long-eared bat within the Project area. Additionally, one potentially suitable roost tree was recorded within the Project area. Accidental take of the federally listed Indiana bat is prohibited under the ESA. Winter tree clearing (between October 1 and March 31) on any trees with a diameter at breast height (dbh) ≥ 3 inches would likely be required to prevent potential loss to this species.

Furthermore, Stantec documented the presence of potentially suitable habitat for listed mussels in the Blanchard River (Stream 1), within the Project area. The Blanchard River is listed as Group 1 stream system. Therefore, though potentially suitable habitat is present, federally listed mussel species are not known to occur and/or are not expected to occur within the Blanchard River due to historical data. Additionally, though the presence of mussel species were confirmed at various locations within the Blanchard River during Stantec's habitat assessment site visit on July 22, no listed species were observed. However, freshwater native mussel species are protected in Ohio, by the ODNR. Further coordination and potential mussel relocation efforts could be required by this Project.

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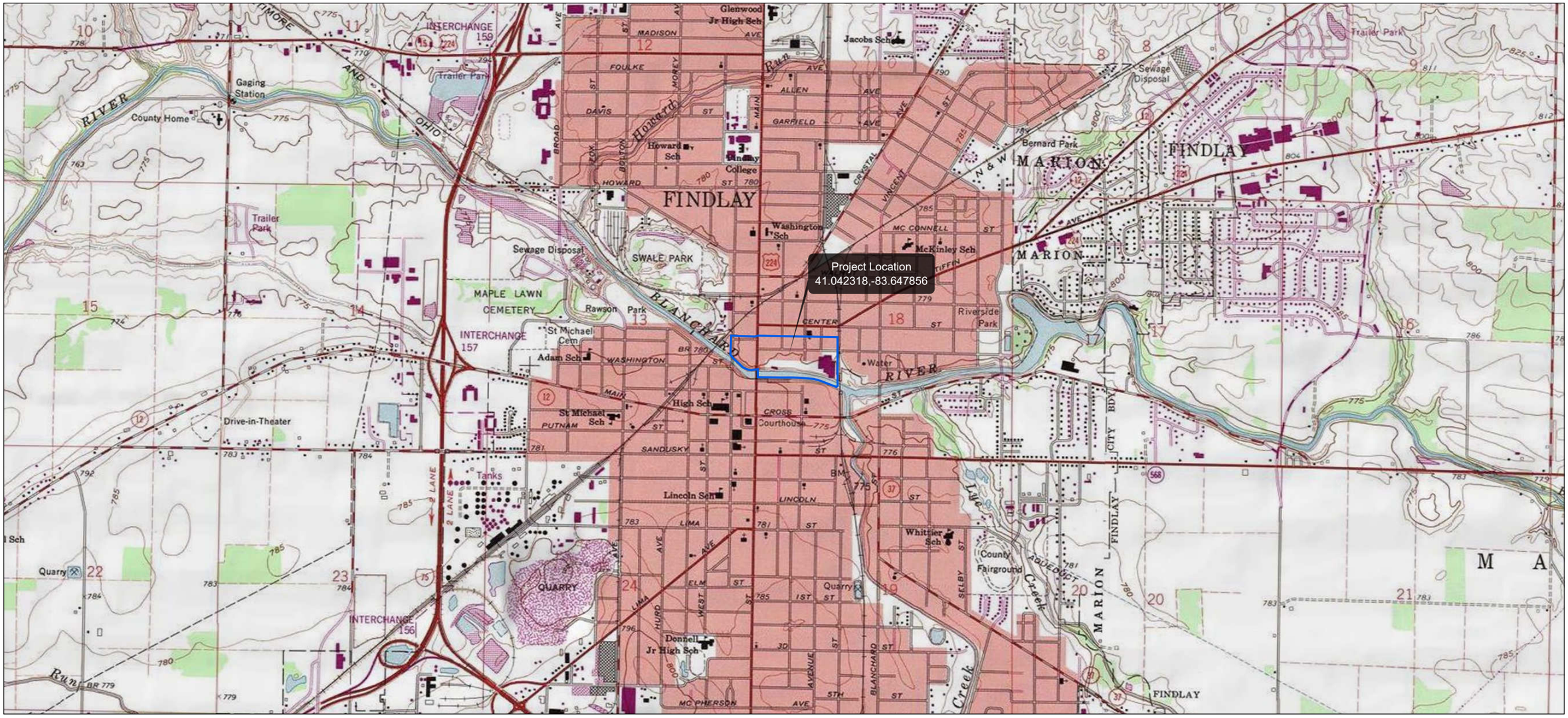
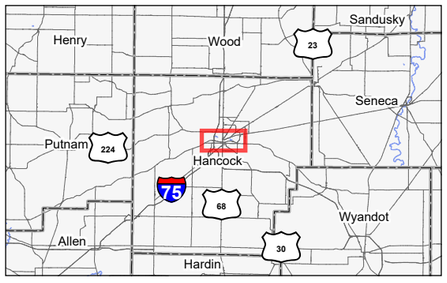
Appendix AFIGURES

FIGURE 1. PROJECT LOCATION MAP





Legend

Project Area

0 1,000 2,000 Feet

(At original document size of 11x17)
1:24,000

N

Stantec

Project Location
Hancock County, OH

Prepared by SEC on 2020-08-20
TR by JH on 2020-08-20
IR by NTN on 2020-09-28

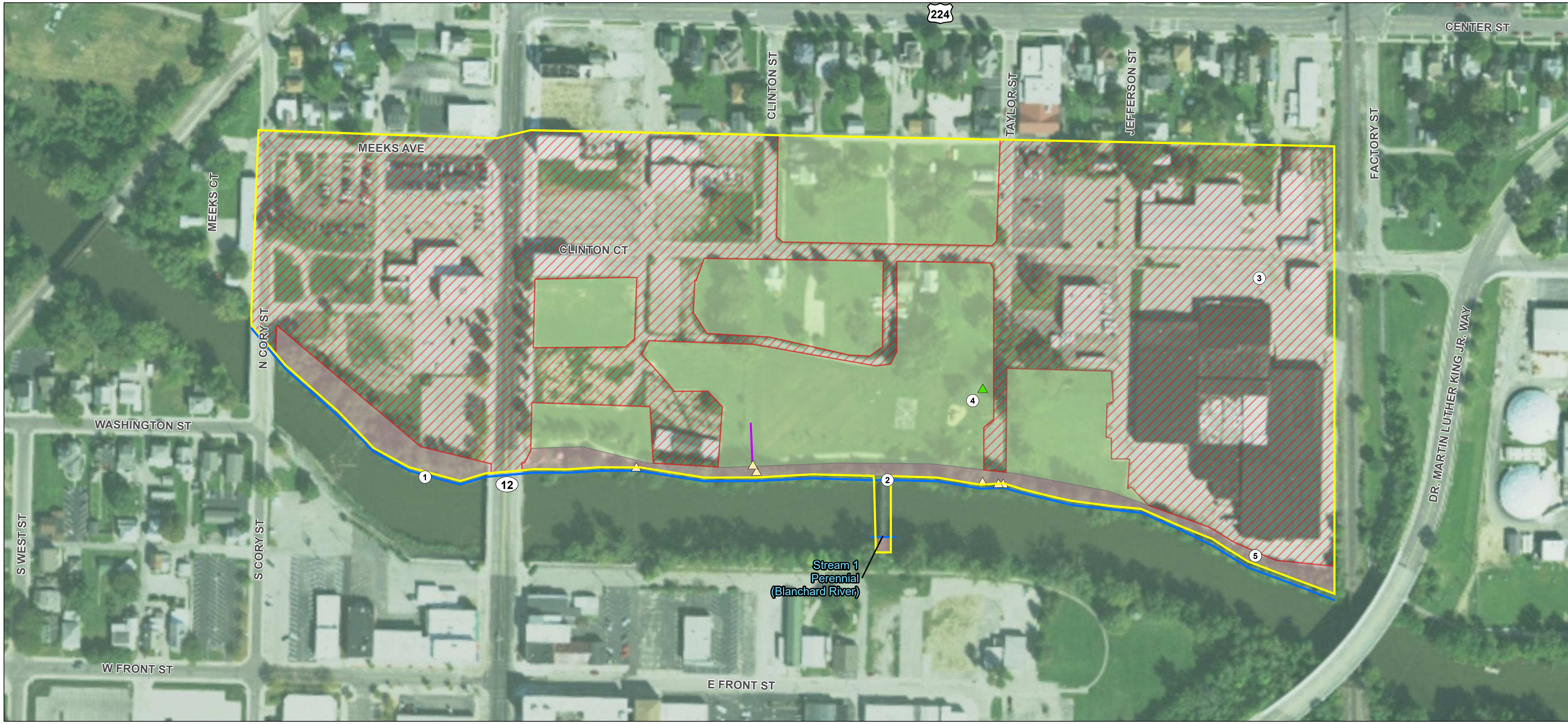
Client/Project
174316204
Maumee Watershed Conservancy District
Additional Hydraulic Improvements Project

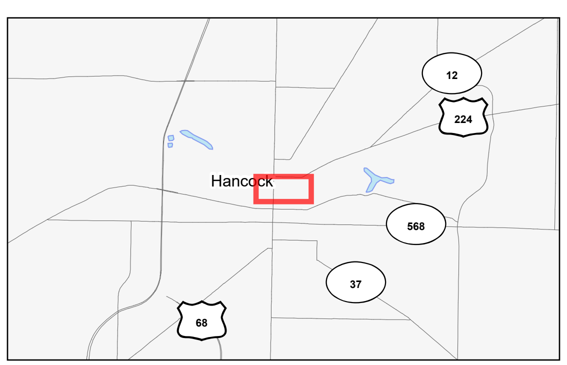
Figure No.
1

Title
Project Location Map

Notes
1. Coordinate System: NAD 1983 StatePlane Ohio North FIPS 3401 Feet
2. Data Sources: Stantec, USGS, NADS
3. Background: 7.5' USGS Topographic Quadrangles

FIGURE 2. HABITAT ASSESSMENT MAP





Legend

- Project Area Limits of Construction
- Photo Location
- Existing Culvert
- Potential Roost Tree
- Upland Drainage Feature
- Field Delineated Waterway

Habitat Area

- Maintained Lawn
- Mixed Early Successional/Second Growth Riparian Forest
- Industrial

0 100 200 Feet

(At original document size of 11x17)
1:2,400

N

Notes

1. Coordinate System: NAD 1983 StatePlane Ohio North FIPS 3401 Feet
2. Data Sources: Stantec, MWCD, USGS, USDA, OGRIP
3. Background: 2017 NAIP

Stantec

Project Location
Hancock County, OH

Prepared by SEC on 2020-08-20
TR by JH on 2020-08-20
IR by AK on 2020-09-02

Client/Project 174316204
Maumee Watershed Conservancy District
Additional Hydraulic Improvements Project

Figure No.
2

Title
Habitat Assessment Map

Appendix B SITE PHOTOGRAPHS

Photo Location 1. View of Stream 1/Blanchard River. Photograph taken facing upstream/east.

Photo Location 1. View of Stream 1/Blanchard River. Photograph taken facing downstream/west.

Photo Location 2. View of Stream 1/Blanchard River. Photograph taken facing upstream/east.

Photo Location 2. View of Stream 1/Blanchard River. Photograph taken facing downstream/west.

Photo Location 3. View of industrial habitat. Photograph taken facing east.

Photo Location 4. View of maintained lawn habitat. Photograph taken facing south.

Photo Location 4. View of PRT-01 within maintained lawn habitat. Photograph taken facing north.

Photo Location 5. View of mixed early successional/second growth riparian forest. Photograph taken facing southeast.