

Chapter 8

Environmental Mitigation

Planning regulations specify that metropolitan transportation plans must include a discussion of potential environmental mitigation activities, to be developed in consultation with Federal, State and Tribal wildlife, land management, and regulatory agencies. The mitigation activities are to be at the policy and/or strategic levels, not project specific. The Northeastern Indiana Regional Coordinating Council has prepared this chapter in consultation with the appropriate federal, state, and local agencies to address the environmental mitigation activities. This document maps the common environmental issues, discusses mitigation strategies, and includes some analysis of the number of specific projects near various features.

The Northeastern Indiana Regional Coordinating Council (NIRCC) is the lead agency for the development of the Transportation Plan for the Fort Wayne-New Haven-Allen County Metropolitan Planning Area. As part of the Participation Plan for the transportation planning process, NIRCC has identified environmental and cultural resource agencies that have been invited to consult on the environmental mitigation discussion. The agencies have been provided access to the 2045 Transportation Plan and proposed plan modifications. The additional information and discussion in this chapter has been provided to the resource agencies and the public for review and comment. NIRCC will consult with the agencies further to address any issues that may arise.

Methodology

There are three components to NIRCC's methodology to address the environmental mitigation requirement. First, through consultation with various agencies and staff review of published materials, maps of the most common environmental features have been developed. These maps display features from our area consistent with INDOT's Environmental Red Flag Investigation Template and other sensitive features and sites identified by NIRCC. Second, a discussion of these is provided including general strategies that are applied when a project is implemented that impacts a particular environmental resource or feature. Third, in aggregate, the number of projects that could impact the various resources have been summarized. It should be noted that the projects are very conceptual at the Transportation Plan stage and specific environmental mitigation strategies will occur as part of the environmental review and preliminary engineering activities. As projects advance to implementation, additional study and design will be conducted. For projects that use state or federal funds, environmental studies in compliance with NEPA and other state and federal requirements will be performed.

Common Environmental Issues

With following a similar format as INDOT's Red Flag Investigation Template NIRCC has identified five common groups of environmental issues for discussion in this 2045 Transportation Plan. The groups of environmental issues include:

- Water Resources
- Threatened and Endangered Species
- Section 4(f) Land
- Cultural Resources
- Other environmentally Sensitive Areas

The following sections provide a brief description of each of these issues, map the items for the NIRCC Metropolitan Planning Area, and discuss mitigation when projects may impact the environmental feature.

Streams and Wetlands

The NIRCC Metropolitan Planning Area (MPA) includes numerous water resources including rivers, streams and potential wetlands as shown in Figures 8-1 and 8-2. Two streams in the NIRCC MPA are identified on the Indiana Listing of Outstanding Rivers and Streams. The Cedar Creek in Northern Allen County is one of three streams in Indiana that made the list as a Natural, Scenic and Recreational River System and is considered to have outstanding ecological importance with high quality water. The Little River, as a tributary to the Wabash River, is part of the Wabash River Heritage Corridor. These waterways are designated on Figure 32. In addition to these designations other water resources that often require special considerations are INDR trout streams and USACE Section 10 streams. These water resources include the Little River (USACE Section 10), Maumee River – Hosey Dam in Fort Wayne (USACE Section 10), Schoaff Park (Trout 2017), and Spy Run Creek (Trout 2017).

The Indiana Department of Environmental Management (IDEM) maintains a list of impaired waters. Figure 8-3 displays the surface waters in Allen County identified by IDEM as impaired and Table 8-1 and Table 8-2 include a listing of Category 4 and 5 waterways along with the cause of impairment. These lists are used to identify impairments for which a Total Maximum Daily Load (TMDL)” study is needed. The Total Maximum Daily Load (TMDL) Program’s primary purpose is to assess streams, rivers and lakes that are considered impaired by the Indiana Department of Environmental Management and develop reports that identify the causes of the impairment, the reductions of pollutants needed, and the actions needed to improve water quality. Impaired waters do not meet designated water quality standards and do not support one or more designated uses, such as recreational, protection of aquatic life, drinking water, and fish consumption. Section 303(d) of the Clean Water Act established authority for the TMDL Program and guides states on how to develop these plans for waters that do not meet water quality standards.

Many transportation projects may cross or run alongside a stream or river or touch a wetland area.

In these cases the goal is to avoid, to the fullest extent practicable, any activity that adversely impacts streams or wetlands during the design, construction, or maintenance of the transportation facility to protect water quality. As nearly all of the projects in the Transportation Plan will use state or federal funds, project design will follow state and federal design procedures and strive to achieve this goal.

Project design will take the appropriate action to avoid, minimize, and mitigate impacts as required by federal, state, and local law. In the event that impacts to streams and wetlands are unavoidable, a wide variety of mitigation strategies will be considered beginning with on-site mitigation opportunities. Once on-site opportunities are exhausted, the search for mitigation strategies will shift to off-site locations. Mitigation strategies may include but are not limited to: mitigation banking; stream and wetland creation; sediment/run-off control and water quality monitoring; restoration; and/or preservation. In general, the Indiana Department of Environmental Management requires that impacted wetlands be replaced with wetlands of the same type at specific mitigation ratios. Applicants may be allowed to create or restore a different type of wetland if it provides better water quality and/or habitat value. Where practical, wetland mitigation/replacement will occur close to the original site and within the same Hydrologic Unit Watershed (see Figure 8-4).

Impact analysis and mitigation are integral parts of the project development process. Early review and analysis of project alternatives by regulatory and resource agencies combined with effective inter-office coordination are required to develop successful transportation projects. Projects will follow guidelines for the development of mitigation as required by the U.S. Army Corps of Engineers (USACE), the Indiana Department of Natural Resources (IDNR), and the Indiana Department of Environmental Management (IDEM).

Mitigation may be needed if a construction project is likely to reduce or degrade an existing habitat in a floodway or floodplain according to the IDNR (see Figure 34). An information bulletin is provided for guidance in the assessment and determination of compensatory mitigation associated with an application to the IDNR for a permit under IC 14-28-1 (the “Flood Control Act”) or under IC 14-29-1 (the “Navigable Waters Act”). These IDNR mitigation guidelines are outlined in their “Information Bulletin #17 Fifth Amendment”.

The USACE mitigation guidelines are outlined in the latest USACE Regulatory Guidance Letter (RGL) 02-02, dated December 24, 2002. The US Army Corps of Engineers requested recognition of the flood control projects within the MPA. Transportation projects will be reviewed to insure they have no adverse effects on the flood control projects or affect water levels in the flood control project area. The flood control projects are displayed in Figure 8-5.

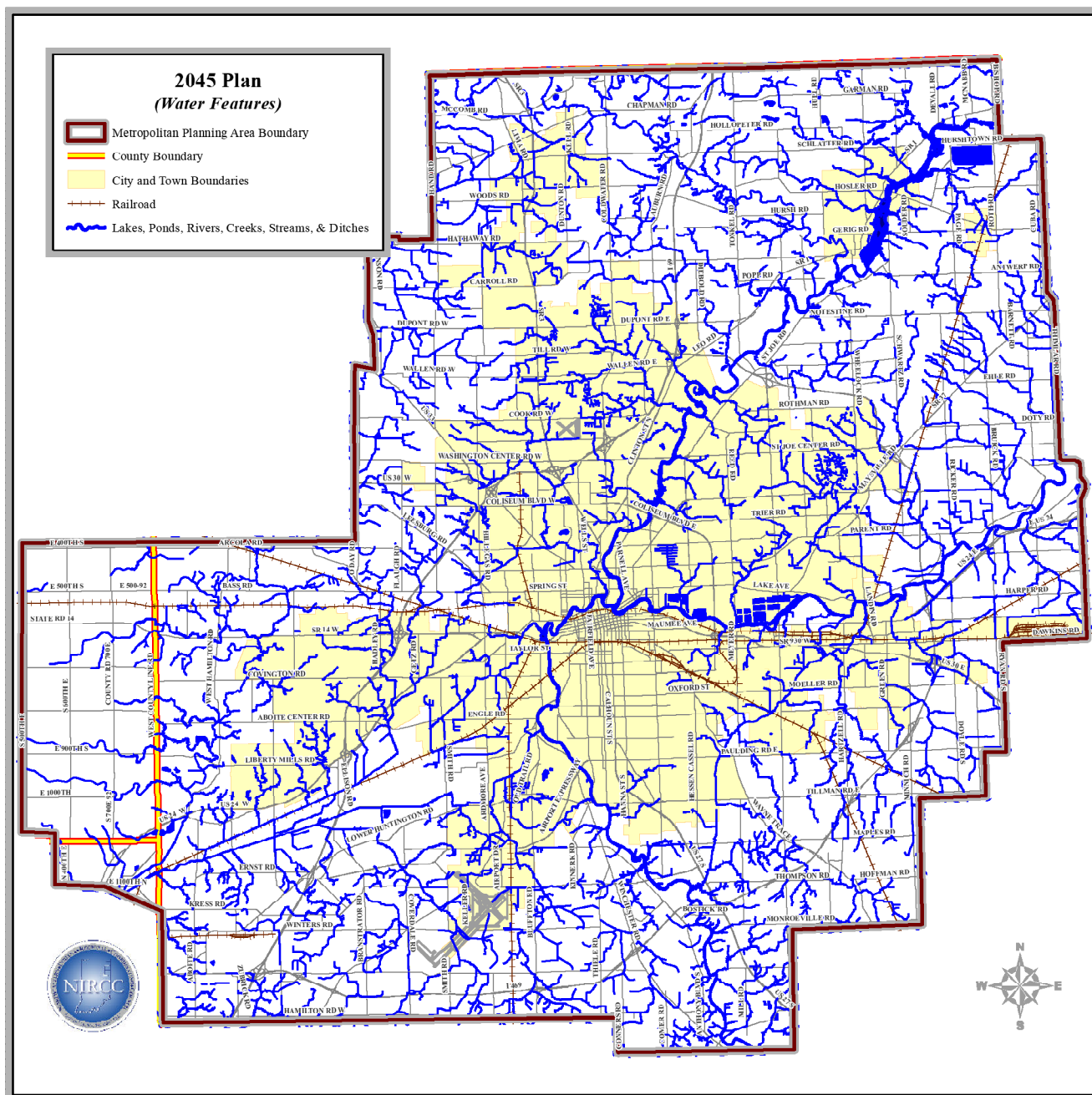


Figure 8-1
Water Features

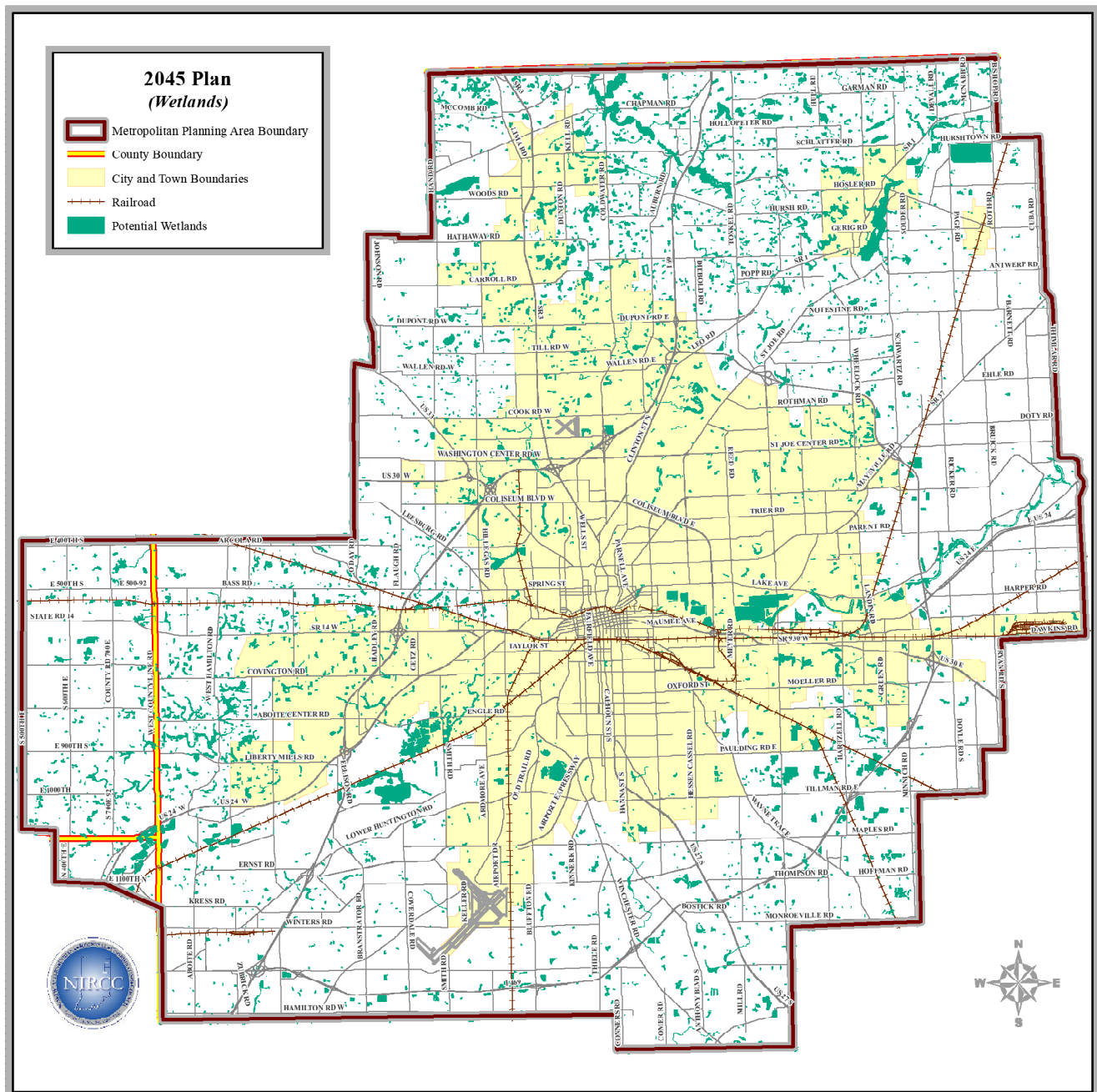


Figure 8-2
Potential Wetlands

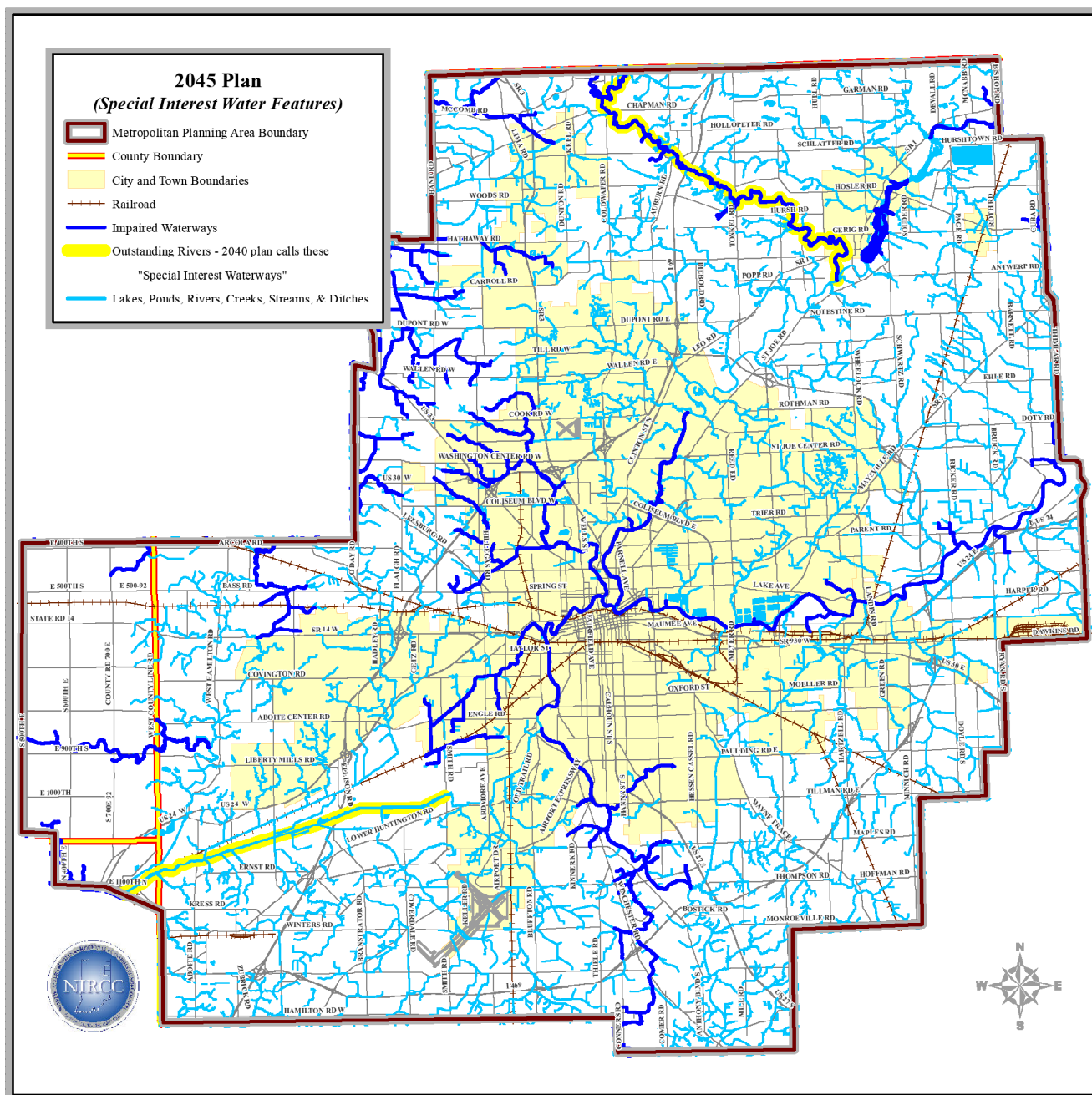
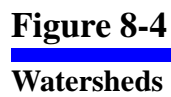


Figure 8-3
Water Features and Impaired Streams



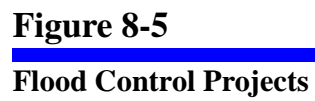


Table 8-1. 2022 Category 5 Impaired Waters in Allen County

2022 303(d) List of Category 5 Impaired Waters Submitted to U.S. EPA

BASIN	HYDROLOGIC UNIT CODE	COUNTY	ASSESSMENT UNIT ID	ASSESSMENT UNIT NAME	WATER TYPE	SIZE	UNITS	PARAMETER	DESIGNATED USE	IR CATEGORY
UPPER WABASH	51201011005	Allen	INB01A5_04	ABOITE CREEK	STREAM	6.25	Miles	ESCHERICHIA COLI (E. COLI)	Full Body Contact	5A
UPPER WABASH	51201011005	Allen/Huntington	INB01A5_05	ABOITE CREEK	STREAM	2.98	Miles	ESCHERICHIA COLI (E. COLI)	Full Body Contact	5A
GREAT LAKES	41000050101	Allen	INA0511_T1002	BENDER DITCH	STREAM	14.77	Miles	ESCHERICHIA COLI (E. COLI)	Full Body Contact	5A
GREAT LAKES	41000050101	Allen	INA0511_T1002	BENDER DITCH	STREAM	14.77	Miles	NUTRIENTS	Warm Water Aquatic Life	5A
GREAT LAKES	41000050101	Allen	INA0511_T1002	BENDER DITCH	STREAM	14.77	Miles	PH	Warm Water Aquatic Life	5A
UPPER WABASH	51201040201	Allen	INB0421_T1001	BENWARD DITCH	STREAM	14.87	Miles	AMMONIA, UN-IONIZED	Warm Water Aquatic Life	5A
UPPER WABASH	51201040201	Allen	INB0421_T1001	BENWARD DITCH	STREAM	14.87	Miles	BIOLOGICAL INTEGRITY	Warm Water Aquatic Life	5A
UPPER WABASH	51201040201	Allen	INB0421_T1001	BENWARD DITCH	STREAM	14.87	Miles	NUTRIENTS	Warm Water Aquatic Life	5A
UPPER WABASH	51201040201	Allen	INB0421_T1001	BENWARD DITCH	STREAM	14.87	Miles	DISSOLVED OXYGEN	Warm Water Aquatic Life	5A
UPPER WABASH	51201011005	Allen/Whitley	INB01A5_T1007	BIG INDIAN CREEK	STREAM	11.21	Miles	ESCHERICHIA COLI (E. COLI)	Full Body Contact	5A
UPPER WABASH	51201011005	Allen/Whitley	INB01A5_T1007	BIG INDIAN CREEK	STREAM	11.21	Miles	BIOLOGICAL INTEGRITY	Warm Water Aquatic Life	5A
GREAT LAKES	41000050104	Allen	INA0514_03	BLACK CREEK	STREAM	3.7	Miles	ESCHERICHIA COLI (E. COLI)	Full Body Contact	5A
GREAT LAKES	41000050104	Allen	INA0514_T1001	BLACK CREEK	STREAM	4.3	Miles	ESCHERICHIA COLI (E. COLI)	Full Body Contact	5A
GREAT LAKES	41000050104	Allen	INA0514_02	BLACK CREEK	STREAM	8.3	Miles	ESCHERICHIA COLI (E. COLI)	Full Body Contact	5A
GREAT LAKES	41000050104	Allen	INA0514_03	BLACK CREEK	STREAM	3.7	Miles	BIOLOGICAL INTEGRITY	Warm Water Aquatic Life	5A
GREAT LAKES	41000050104	Allen	INA0514_03	BLACK CREEK	STREAM	3.7	Miles	NUTRIENTS	Warm Water Aquatic Life	5A
GREAT LAKES	41000050104	Allen	INA0514_02	BLACK CREEK	STREAM	8.3	Miles	BIOLOGICAL INTEGRITY	Warm Water Aquatic Life	5A
GREAT LAKES	41000050104	Allen	INA0514_02	BLACK CREEK	STREAM	8.3	Miles	NUTRIENTS	Warm Water Aquatic Life	5A
GREAT LAKES	41000050104	Allen	INA0514_02	BLACK CREEK	STREAM	8.3	Miles	PH	Warm Water Aquatic Life	5A
GREAT LAKES	41000050104	Allen	INA0514_02	BLACK CREEK	STREAM	8.3	Miles	DISSOLVED OXYGEN	Warm Water Aquatic Life	5A
GREAT LAKES	41000050104	Allen	INA0514_T1002	BLACK CREEK - UNNAMED TRIBUTARY	STREAM	1.48	Miles	ESCHERICHIA COLI (E. COLI)	Full Body Contact	5A
GREAT LAKES	41000071204	Allen	INA07C4_T1003	BROWN DITCH	STREAM	1.44	Miles	BIOLOGICAL INTEGRITY	Warm Water Aquatic Life	5A
GREAT LAKES	41000071204	Allen	INA07C4_T1004	BROWN DITCH	STREAM	6.56	Miles	BIOLOGICAL INTEGRITY	Warm Water Aquatic Life	5A
GREAT LAKES	41000030707	Allen	INA0377_T1009	CEDAR CREEK - UNNAMED TRIBUTARY	STREAM	0.6889	Miles	PCBS IN FISH TISSUE	Human Health and Wildlife	5B
GREAT LAKES	41000030707	Allen	INA0377_T1010	CEDAR CREEK - UNNAMED TRIBUTARY	STREAM	0.6001	Miles	PCBS IN FISH TISSUE	Human Health and Wildlife	5B
GREAT LAKES	41000030707	Allen	INA0377_T1011	CEDAR CREEK - UNNAMED TRIBUTARY	STREAM	0.1988	Miles	PCBS IN FISH TISSUE	Human Health and Wildlife	5B
GREAT LAKES	41000030707	Allen	INA0377_06	CEDAR CREEK (OSRW)	STREAM	0.4555	Miles	PCBS IN FISH TISSUE	Human Health and Wildlife	5B
GREAT LAKES	41000030707	Allen	INA0377_07	CEDAR CREEK (OSRW)	STREAM	11.134	Miles	PCBS IN FISH TISSUE	Human Health and Wildlife	5B
GREAT LAKES	41000030707	Allen/DeKalb	INA0377_05	CEDAR CREEK (OSRW)	STREAM	3.08	Miles	PCBS IN FISH TISSUE	Human Health and Wildlife	5B
GREAT LAKES	41000030804	Allen	INA03P1024_00	CEDARVILLE RESERVOIR	LAKE, FRESHWATER	408	Acres	ESCHERICHIA COLI (E. COLI)	Full Body Contact	5A
GREAT LAKES	41000030804	Allen	INA03P1024_00	CEDARVILLE RESERVOIR	LAKE, FRESHWATER	408	Acres	PCBS IN FISH TISSUE	Human Health and Wildlife	5B
GREAT LAKES	41000030804	Allen	INA03P1024_00	CEDARVILLE RESERVOIR	LAKE, FRESHWATER	408	Acres	TASTE	Public Water Supply	5A
GREAT LAKES	41000030804	Allen	INA03P1024_00	CEDARVILLE RESERVOIR	LAKE, FRESHWATER	408	Acres	ALGAE	Warm Water Aquatic Life	5A
UPPER WABASH	51201040202	Allen	INB0422_02	EEL RIVER	STREAM	3.33	Miles	ESCHERICHIA COLI (E. COLI)	Full Body Contact	5A
UPPER WABASH	51201040202	Allen	INB0422_02	EEL RIVER	STREAM	3.33	Miles	PCBS IN FISH TISSUE	Human Health and Wildlife	5B
UPPER WABASH	51201040201	Allen	INB0421_03	EEL RIVER	STREAM	2.87	Miles	BIOLOGICAL INTEGRITY	Warm Water Aquatic Life	5A
UPPER WABASH	51201040202	Allen	INB0422_02	EEL RIVER	STREAM	3.33	Miles	BIOLOGICAL INTEGRITY	Warm Water Aquatic Life	5A
UPPER WABASH	51201040203	Allen/Whitley	INB0423_01	EEL RIVER	STREAM	8.12	Miles	ESCHERICHIA COLI (E. COLI)	Full Body Contact	5A
UPPER WABASH	51201040203	Allen/Whitley	INB0423_01	EEL RIVER	STREAM	8.12	Miles	PCBS IN FISH TISSUE	Human Health and Wildlife	5B
UPPER WABASH	51201010904	Allen/Wells	INB0194_01	EIGHTMILE CREEK	STREAM	7.45	Miles	BIOLOGICAL INTEGRITY	Warm Water Aquatic Life	5A
GREAT LAKES	41000071204	Allen	INA07C4_01	FLATROCK CREEK	STREAM	5.08	Miles	BIOLOGICAL INTEGRITY	Warm Water Aquatic Life	5A
GREAT LAKES	41000071204	Allen	INA07C4_03	FLATROCK CREEK	STREAM	7.19	Miles	BIOLOGICAL INTEGRITY	Warm Water Aquatic Life	5A
GREAT LAKES	41000071204	Allen	INA07C4_03	FLATROCK CREEK	STREAM	7.19	Miles	DISSOLVED OXYGEN	Warm Water Aquatic Life	5A
UPPER WABASH	51201040201	Allen	INB0421_02	GELLER DITCH	STREAM	4.39	Miles	BIOLOGICAL INTEGRITY	Warm Water Aquatic Life	5A
GREAT LAKES	41000071203	Allen	INA07C3_T1006	GROMEAX DITCH	STREAM	4.48	Miles	BIOLOGICAL INTEGRITY	Warm Water Aquatic Life	5A
GREAT LAKES	41000050203	Allen	INA0523_T1007A	HAMM DITCH	STREAM	0.28	Miles	ESCHERICHIA COLI (E. COLI)	Full Body Contact	5A
GREAT LAKES	41000050203	Allen/DeKalb	INA0523_T1007	HAMM DITCH	STREAM	9.6	Miles	ESCHERICHIA COLI (E. COLI)	Full Body Contact	5A
GREAT LAKES	41000050202	Allen	INA0522_T1002	HAMM INTERCEPTOR DITCH	STREAM	4.9	Miles	BIOLOGICAL INTEGRITY	Warm Water Aquatic Life	5A
GREAT LAKES	41000050202	Allen	INA0522_T1002	HAMM INTERCEPTOR DITCH	STREAM	4.9	Miles	NUTRIENTS	Warm Water Aquatic Life	5A
GREAT LAKES	41000050202	Allen	INA0523_01	HAMM INTERCEPTOR DITCH	STREAM	6.38	Miles	BIOLOGICAL INTEGRITY	Warm Water Aquatic Life	5A
GREAT LAKES	41000050203	Allen	INA0523_01	HAMM INTERCEPTOR DITCH	STREAM	6.38	Miles	NUTRIENTS	Warm Water Aquatic Life	5A
GREAT LAKES	41000050203	Allen	INA0523_T1003	JACKSON DITCH	STREAM	2.49	Miles	BIOLOGICAL INTEGRITY	Warm Water Aquatic Life	5A
GREAT LAKES	41000050203	Allen	INA0523_T1003	JACKSON DITCH	STREAM	2.49	Miles	NUTRIENTS	Warm Water Aquatic Life	5A
GREAT LAKES	41000050203	Allen/DeKalb	INA0523_T1002	JACKSON NUMBER TWO DITCH	STREAM	6.77	Miles	BIOLOGICAL INTEGRITY	Warm Water Aquatic Life	5A
GREAT LAKES	41000050203	Allen/DeKalb	INA0523_T1002	JACKSON NUMBER TWO DITCH	STREAM	6.77	Miles	NUTRIENTS	Warm Water Aquatic Life	5A
UPPER WABASH	51201040202	Allen	INB0422_T1002	JOHNSON DITCH	STREAM	6.34	Miles	BIOLOGICAL INTEGRITY	Warm Water Aquatic Life	5A
UPPER WABASH	51201040202	Allen	INB0422_T1002	JOHNSON DITCH	STREAM	6.34	Miles	DISSOLVED OXYGEN	Warm Water Aquatic Life	5A
UPPER WABASH	51201040202	Allen	INB0422_T1006	JOHNSON DITCH	STREAM	5.82	Miles	BIOLOGICAL INTEGRITY	Warm Water Aquatic Life	5A
UPPER WABASH	51201040202	Allen	INB0422_T1006	JOHNSON DITCH	STREAM	5.82	Miles	NUTRIENTS	Warm Water Aquatic Life	5A
UPPER WABASH	51201040202	Allen	INB0422_T1006	JOHNSON DITCH	STREAM	5.82	Miles	DISSOLVED OXYGEN	Warm Water Aquatic Life	5A
UPPER WABASH	51201040202	Allen	INB0422_T1006A	JOHNSON DITCH	STREAM	0.85	Miles	BIOLOGICAL INTEGRITY	Warm Water Aquatic Life	5A
UPPER WABASH	51201040202	Allen	INB0422_T1006A	JOHNSON DITCH	STREAM	0.85	Miles	NUTRIENTS	Warm Water Aquatic Life	5A
UPPER WABASH	51201040202	Allen	INB0422_T1006A	JOHNSON DITCH	STREAM	0.85	Miles	DISSOLVED OXYGEN	Warm Water Aquatic Life	5A
UPPER WABASH	51201040202	Allen	INB0422_T1004	JOHNSON DITCH - UNNAMED TRIBUTARY	STREAM	4.93	Miles	DISSOLVED OXYGEN	Warm Water Aquatic Life	5A
UPPER WABASH	51201040202	Allen/Whitley	INB0422_T1005	JOHNSON DRAIN	STREAM	12.29	Miles	BIOLOGICAL INTEGRITY	Warm Water Aquatic Life	5A
UPPER WABASH	51201040202	Allen/Whitley	INB0422_T1005	JOHNSON DRAIN	STREAM	12.29	Miles	NUTRIENTS	Warm Water Aquatic Life	5A
UPPER WABASH	51201040202	Allen/Whitley	INB0422_T1005	JOHNSON DRAIN	STREAM	12.29	Miles	DISSOLVED OXYGEN	Warm Water Aquatic Life	5A
GREAT LAKES	41000050203	Allen	INA0523_T1005	KNAPP DITCH	STREAM	2.6	Miles	BIOLOGICAL INTEGRITY	Warm Water Aquatic Life	5A
GREAT LAKES	41000050203	Allen	INA0523_T1005	KNAPP DITCH	STREAM	2.6	Miles	NUTRIENTS	Warm Water Aquatic Life	5A
GREAT LAKES	41000050102	Allen	INA0512_02	MAUMEE RIVER	STREAM	1.21	Miles	PCBS IN FISH TISSUE	Human Health and Wildlife	5B
GREAT LAKES	41000050102	Allen	INA0512_05	MAUMEE RIVER	STREAM	0.26	Miles	PCBS IN FISH TISSUE	Human Health and Wildlife	5B
GREAT LAKES	41000050103	Allen	INA0513_01	MAUMEE RIVER	STREAM	6.42	Miles	PCBS IN FISH TISSUE	Human Health and Wildlife	5B
GREAT LAKES	41000050105	Allen	INA0515_01	MAUMEE RIVER	STREAM	4.19	Miles	PCBS IN FISH TISSUE	Human Health and Wildlife	5B
GREAT LAKES	41000050105	Allen	INA0515_02	MAUMEE RIVER	STREAM	6.97	Miles	PCBS IN FISH TISSUE	Human Health and Wildlife	5B
GREAT LAKES	41000050202	Allen	INA0522_03	MAUMEE RIVER	STREAM	0.91	Miles	PCBS IN FISH TISSUE	Human Health and Wildlife	5B
GREAT LAKES	41000050202	Allen	INA0522_04	MAUMEE RIVER	STREAM	1.7	Miles	PCBS IN FISH TISSUE	Human Health and Wildlife	5B
GREAT LAKES	41000050102	Allen	INA0512_04	MAUMEE RIVER	STREAM	0.73	Miles	PCBS IN FISH TISSUE	Human Health and Wildlife	5B
GREAT LAKES	41000050102	Allen	INA0512_01	MAUMEE RIVER	STREAM	2.11	Miles	PCBS IN FISH TISSUE	Human Health and Wildlife	5B
GREAT LAKES	41000050102	Allen	INA0512_03	MAUMEE RIVER	STREAM	6.31	Miles	PCBS IN FISH TISSUE	Human Health and Wildlife	5B
GREAT LAKES	41000050106	Allen	INA0516_01	MAUMEE RIVER	STREAM	5.85	Miles	PCBS IN FISH TISSUE	Human Health and Wildlife	5B
GREAT LAKES	41000050102	Allen	INA0512_02	MAUMEE RIVER	STREAM	1.21	Miles	BIOLOGICAL INTEGRITY	Warm Water Aquatic Life	5A

Table 8-1 Continued next page...

TTable 8-1. 2022 Category 5 Impaired Waters in Allen County

2022 303(d) List of Category 5 Impaired Waters Submitted to U.S. EPA

BASIN	HYDROLOGIC UNIT CODE	COUNTY	ASSESSMENT UNIT ID	ASSESSMENT UNIT NAME	WATER TYPE	SIZE	UNITS	PARAMETER	DESIGNATED USE	IR CATEGORY
GREAT LAKES	41000050102	Allen	INA0512_02	MAUMEE RIVER	STREAM	1.21	Miles	NUTRIENTS	Warm Water Aquatic Life	5A
GREAT LAKES	41000050102	Allen	INA0512_05	MAUMEE RIVER	STREAM	0.26	Miles	NUTRIENTS	Warm Water Aquatic Life	5A
GREAT LAKES	41000050103	Allen	INA0513_01	MAUMEE RIVER	STREAM	6.42	Miles	BIOLOGICAL INTEGRITY	Warm Water Aquatic Life	5A
GREAT LAKES	41000050105	Allen	INA0515_02	MAUMEE RIVER	STREAM	6.97	Miles	NUTRIENTS	Warm Water Aquatic Life	5A
GREAT LAKES	41000050202	Allen	INA0522_03	MAUMEE RIVER	STREAM	0.91	Miles	NUTRIENTS	Warm Water Aquatic Life	5A
GREAT LAKES	41000050202	Allen	INA0522_04	MAUMEE RIVER	STREAM	1.7	Miles	NUTRIENTS	Warm Water Aquatic Life	5A
GREAT LAKES	41000050102	Allen	INA0512_04	MAUMEE RIVER	STREAM	0.73	Miles	NUTRIENTS	Warm Water Aquatic Life	5A
GREAT LAKES	41000050102	Allen	INA0512_01	MAUMEE RIVER	STREAM	2.11	Miles	BIOLOGICAL INTEGRITY	Warm Water Aquatic Life	5A
GREAT LAKES	41000050102	Allen	INA0512_01	MAUMEE RIVER	STREAM	2.11	Miles	NUTRIENTS	Warm Water Aquatic Life	5A
GREAT LAKES	41000050102	Allen	INA0512_03	MAUMEE RIVER	STREAM	6.31	Miles	NUTRIENTS	Warm Water Aquatic Life	5A
GREAT LAKES	41000050106	Allen	INA0516_01	MAUMEE RIVER	STREAM	5.85	Miles	NUTRIENTS	Warm Water Aquatic Life	5A
UPPER WABASH	51201040205	Allen/Whitley	INB0425_T1001	REHLING DITCH	STREAM	3.61	Miles	DISSOLVED OXYGEN	Warm Water Aquatic Life	5A
UPPER WABASH	51201011001	Allen	INB01A1_01	SEEGAR DITCH	STREAM	14.06	Miles	ESCHERICHIA COLI (E. COLI)	Full Body Contact	5A
UPPER WABASH	51201011001	Allen	INB01A1_01	SEEGAR DITCH	STREAM	14.06	Miles	BIOLOGICAL INTEGRITY	Warm Water Aquatic Life	5A
UPPER WABASH	51201011001	Allen	INB01A1_01	SEEGAR DITCH	STREAM	14.06	Miles	DISSOLVED OXYGEN	Warm Water Aquatic Life	5A
UPPER WABASH	51201011001	Allen	INB01A1_T1001	SEEGAR DITCH - UNNAMED TRIBUTARY	STREAM	1.45	Miles	ESCHERICHIA COLI (E. COLI)	Full Body Contact	5A
UPPER WABASH	51201011001	Allen	INB01A1_T1002	SEEGAR DITCH - UNNAMED TRIBUTARY	STREAM	1.4	Miles	ESCHERICHIA COLI (E. COLI)	Full Body Contact	5A
UPPER WABASH	51201040201	Allen	INB0421_T1002	SHOAF DAWSON DITCH	STREAM	4.21	Miles	BIOLOGICAL INTEGRITY	Warm Water Aquatic Life	5A
UPPER WABASH	51201040204	Allen/Whitley	INB0424_T1005	SOLON DITCH	STREAM	9.93	Miles	BIOLOGICAL INTEGRITY	Warm Water Aquatic Life	5A
GREAT LAKES	41000050203	Allen	INA0523_T1001	SOWERS DITCH	STREAM	2.17	Miles	BIOLOGICAL INTEGRITY	Warm Water Aquatic Life	5A
GREAT LAKES	41000050203	Allen	INA0523_T1001	SOWERS DITCH	STREAM	2.17	Miles	NUTRIENTS	Warm Water Aquatic Life	5A
GREAT LAKES	41000040605	Allen	INA0465_03	SPY RUN CREEK	STREAM	1.85	Miles	BIOLOGICAL INTEGRITY	Warm Water Aquatic Life	5A
GREAT LAKES	41000040605	Allen	INA0465_01	SPY RUN CREEK	STREAM	8.26	Miles	BIOLOGICAL INTEGRITY	Warm Water Aquatic Life	5A
GREAT LAKES	41000040605	Allen	INA0465_T1003	SPY RUN CREEK - UNNAMED TRIBUTARY	STREAM	7.47	Miles	BIOLOGICAL INTEGRITY	Warm Water Aquatic Life	5A
GREAT LAKES	41000030806	Allen	INA03P1044_00	ST. JOSEPH RESERVOIR	LAKE, FRESHWATER	30	Acres	ESCHERICHIA COLI (E. COLI)	Full Body Contact	5A
GREAT LAKES	41000030806	Allen	INA03P1044_00	ST. JOSEPH RESERVOIR	LAKE, FRESHWATER	30	Acres	PCBS IN FISH TISSUE	Human Health and Wildlife	5B
GREAT LAKES	41000030806	Allen	INA0386_06	ST. JOSEPH RIVER	STREAM	1.4331	Miles	PCBS IN FISH TISSUE	Human Health and Wildlife	5B
GREAT LAKES	41000030806	Allen	INA0386_03	ST. JOSEPH RIVER	STREAM	1.57	Miles	PCBS IN FISH TISSUE	Human Health and Wildlife	5B
GREAT LAKES	41000030806	Allen	INA0386_04	ST. JOSEPH RIVER	STREAM	1.1005	Miles	PCBS IN FISH TISSUE	Human Health and Wildlife	5B
GREAT LAKES	41000030806	Allen	INA0386_05	ST. JOSEPH RIVER (PWS)	STREAM	0.1761	Miles	PCBS IN FISH TISSUE	Human Health and Wildlife	5B
GREAT LAKES	41000040606	Allen	INA0466_02	ST. MARYS RIVER	STREAM	1.09	Miles	PCBS IN FISH TISSUE	Human Health and Wildlife	5B
GREAT LAKES	41000040606	Allen	INA0466_03	ST. MARYS RIVER	STREAM	0.64	Miles	PCBS IN FISH TISSUE	Human Health and Wildlife	5B
GREAT LAKES	41000040606	Allen	INA0466_04	ST. MARYS RIVER	STREAM	0.34	Miles	PCBS IN FISH TISSUE	Human Health and Wildlife	5B
GREAT LAKES	41000040606	Allen	INA0466_05	ST. MARYS RIVER	STREAM	1.12	Miles	PCBS IN FISH TISSUE	Human Health and Wildlife	5B
GREAT LAKES	41000040606	Allen	INA0466_06	ST. MARYS RIVER	STREAM	0.72	Miles	PCBS IN FISH TISSUE	Human Health and Wildlife	5B
GREAT LAKES	41000040606	Allen	INA0466_08	ST. MARYS RIVER	STREAM	0.89	Miles	PCBS IN FISH TISSUE	Human Health and Wildlife	5B
GREAT LAKES	41000040606	Allen	INA0466_07	ST. MARYS RIVER	STREAM	0.43	Miles	PCBS IN FISH TISSUE	Human Health and Wildlife	5B
GREAT LAKES	41000040604	Allen	INA0464_02	ST. MARYS RIVER	STREAM	3.28	Miles	NUTRIENTS	Warm Water Aquatic Life	5A
GREAT LAKES	41000040604	Allen	INA0464_03	ST. MARYS RIVER	STREAM	3.07	Miles	NUTRIENTS	Warm Water Aquatic Life	5A
GREAT LAKES	41000040606	Allen	INA0466_02	ST. MARYS RIVER	STREAM	1.09	Miles	NUTRIENTS	Warm Water Aquatic Life	5A
GREAT LAKES	41000040606	Allen	INA0466_03	ST. MARYS RIVER	STREAM	0.64	Miles	NUTRIENTS	Warm Water Aquatic Life	5A
GREAT LAKES	41000040606	Allen	INA0466_04	ST. MARYS RIVER	STREAM	0.34	Miles	NUTRIENTS	Warm Water Aquatic Life	5A
GREAT LAKES	41000040606	Allen	INA0466_05	ST. MARYS RIVER	STREAM	1.12	Miles	NUTRIENTS	Warm Water Aquatic Life	5A
GREAT LAKES	41000040606	Allen	INA0466_06	ST. MARYS RIVER	STREAM	0.72	Miles	NUTRIENTS	Warm Water Aquatic Life	5A
GREAT LAKES	41000040606	Allen	INA0466_08	ST. MARYS RIVER	STREAM	0.89	Miles	NUTRIENTS	Warm Water Aquatic Life	5A
GREAT LAKES	41000040602	Allen	INA0462_01	ST. MARYS RIVER	STREAM	10.06	Miles	NUTRIENTS	Warm Water Aquatic Life	5A
GREAT LAKES	41000040606	Allen	INA0466_07	ST. MARYS RIVER	STREAM	0.43	Miles	NUTRIENTS	Warm Water Aquatic Life	5A
GREAT LAKES	41000040606	Allen	INA0466_01	ST. MARYS RIVER (FOSTER PARK)	STREAM	0.37	Miles	NUTRIENTS	Warm Water Aquatic Life	5A
GREAT LAKES	41000050203	Allen	INA0523_T1008	WANN DITCH	STREAM	10.85	Miles	ESCHERICHIA COLI (E. COLI)	Full Body Contact	5A
GREAT LAKES	41000030706	Allen	INA0376_T1001	YANT DITCH	STREAM	1.46	Miles	ESCHERICHIA COLI (E. COLI)	Full Body Contact	5A
GREAT LAKES	41000030706	Allen	INA0376_T1001	YANT DITCH	STREAM	1.46	Miles	BIOLOGICAL INTEGRITY	Warm Water Aquatic Life	5A
GREAT LAKES	41000030706	Allen	INA0376_T1001	YANT DITCH	STREAM	1.46	Miles	NUTRIENTS	Warm Water Aquatic Life	5A
GREAT LAKES	41000030706	Allen	INA0376_T1001	YANT DITCH	STREAM	1.46	Miles	DISSOLVED OXYGEN	Warm Water Aquatic Life	5A

Table 8-2. 2022 Category 4 Impaired Waters in Allen County

2022 303(d) List of Category 4 Impaired Waters Submitted to U.S. EPA

BASIN	HYDROLOGIC UNIT CODE	COUNTY	ASSESSMENT UNIT ID	ASSESSMENT UNIT NAME	WATER TYPE	SIZE Miles	PARAMETER	DESIGNATED USE	IR CATEGORY	CATEGORY 4A TMDL KEY
GREAT LAKES	41000030803	Allen	INA0383_T1003	BOGER DITCH	STREAM	1.71	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	51
GREAT LAKES	41000030707	Allen	INA0377_T1009	CEDAR CREEK - UNNAMED TRIBUTARY	STREAM	0.6889	BIOLOGICAL INTEGRITY	Warm Water Aquatic Life	4A	51
GREAT LAKES	41000030707	Allen	INA0377_T1009	CEDAR CREEK - UNNAMED TRIBUTARY	STREAM	0.6889	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	51
GREAT LAKES	41000030707	Allen	INA0377_T1010	CEDAR CREEK - UNNAMED TRIBUTARY	STREAM	0.6001	BIOLOGICAL INTEGRITY	Warm Water Aquatic Life	4A	51
GREAT LAKES	41000030707	Allen	INA0377_T1010	CEDAR CREEK - UNNAMED TRIBUTARY	STREAM	0.6001	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	51
GREAT LAKES	41000030707	Allen	INA0377_T1011	CEDAR CREEK - UNNAMED TRIBUTARY	STREAM	0.1988	BIOLOGICAL INTEGRITY	Warm Water Aquatic Life	4A	51
GREAT LAKES	41000030707	Allen	INA0377_T1011	CEDAR CREEK - UNNAMED TRIBUTARY	STREAM	0.1988	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	51
GREAT LAKES	41000030707	Allen	INA0377_06	CEDAR CREEK (OSRW)	STREAM	0.4555	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	51
GREAT LAKES	41000030707	Allen	INA0377_07	CEDAR CREEK (OSRW)	STREAM	11.134	BIOLOGICAL INTEGRITY	Warm Water Aquatic Life	4A	51
GREAT LAKES	41000030707	Allen	INA0377_07	CEDAR CREEK (OSRW)	STREAM	11.134	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	51
GREAT LAKES	41000030707	Allen/DeKalb	INA0377_05	CEDAR CREEK (OSRW)	STREAM	3.08	BIOLOGICAL INTEGRITY	Warm Water Aquatic Life	4A	51
GREAT LAKES	41000030707	Allen/DeKalb	INA0377_05	CEDAR CREEK (OSRW)	STREAM	3.08	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	51
GREAT LAKES	41000040606	Allen	INA0466_T1001	JUNK DITCH	STREAM	7.84	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000040606	Allen	INA0466_T1003	JUNK DITCH	STREAM	2.17	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000030706	Allen	INA0376_T1004	KRUMLAUF BRANCH	STREAM	1.57	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	51
GREAT LAKES	41000030705	Allen/DeKalb	INA0375_06	LITTLE CEDAR CREEK	STREAM	2.32	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	51
GREAT LAKES	41000050102	Allen	INA0512_01	MAUMEE RIVER	STREAM	2.11	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000050102	Allen	INA0512_02	MAUMEE RIVER	STREAM	1.21	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000050102	Allen	INA0512_03	MAUMEE RIVER	STREAM	6.31	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000050102	Allen	INA0512_04	MAUMEE RIVER	STREAM	0.73	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000050102	Allen	INA0512_05	MAUMEE RIVER	STREAM	0.26	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000050103	Allen	INA0513_01	MAUMEE RIVER	STREAM	6.42	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000050105	Allen	INA0515_01	MAUMEE RIVER	STREAM	4.19	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000050105	Allen	INA0515_02	MAUMEE RIVER	STREAM	6.97	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000050106	Allen	INA0516_01	MAUMEE RIVER	STREAM	5.85	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000050202	Allen	INA0522_03	MAUMEE RIVER	STREAM	0.91	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000040604	Allen	INA0464_T1001	SNYDER DITCH	STREAM	10.22	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000040605	Allen	INA0465_01	SPY RUN CREEK	STREAM	8.26	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000040605	Allen	INA0465_01	SPY RUN CREEK	STREAM	8.26	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000040605	Allen	INA0465_01	SPY RUN CREEK	STREAM	8.26	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000040605	Allen	INA0465_02	SPY RUN CREEK	STREAM	0.86	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000040605	Allen	INA0465_02	SPY RUN CREEK	STREAM	0.86	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000040605	Allen	INA0465_03	SPY RUN CREEK	STREAM	1.85	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000040605	Allen	INA0465_T1001	SPY RUN CREEK - UNNAMED TRIBUTARY	STREAM	5.86	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000040605	Allen	INA0465_T1003	SPY RUN CREEK - UNNAMED TRIBUTARY	STREAM	7.47	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000030803	Allen	INA0383_02	ST. JOSEPH RIVER	STREAM	6.73	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	51
GREAT LAKES	41000030806	Allen	INA0386_04	ST. JOSEPH RIVER	STREAM	1.1005	BIOLOGICAL INTEGRITY	Warm Water Aquatic Life	4A	51
GREAT LAKES	41000040504	Adams/Allen	INA0454_03	ST. MARYS RIVER	STREAM	9.8614	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000040504	Adams/Allen	INA0454_03	ST. MARYS RIVER	STREAM	9.8614	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000040602	Allen	INA0462_01	ST. MARYS RIVER	STREAM	10.06	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000040604	Allen	INA0464_01	ST. MARYS RIVER	STREAM	2	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000040604	Allen	INA0464_01	ST. MARYS RIVER	STREAM	2	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000040604	Allen	INA0464_02	ST. MARYS RIVER	STREAM	3.28	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000040604	Allen	INA0464_02	ST. MARYS RIVER	STREAM	3.28	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000040604	Allen	INA0464_03	ST. MARYS RIVER	STREAM	3.07	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000040604	Allen	INA0464_03	ST. MARYS RIVER	STREAM	3.07	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000040606	Allen	INA0466_02	ST. MARYS RIVER	STREAM	1.09	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000040606	Allen	INA0466_03	ST. MARYS RIVER	STREAM	0.64	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000040606	Allen	INA0466_04	ST. MARYS RIVER	STREAM	0.34	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000040606	Allen	INA0466_05	ST. MARYS RIVER	STREAM	1.12	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000040606	Allen	INA0466_06	ST. MARYS RIVER	STREAM	0.72	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000040606	Allen	INA0466_07	ST. MARYS RIVER	STREAM	0.43	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000040606	Allen	INA0466_08	ST. MARYS RIVER	STREAM	0.89	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000040504	Allen	INA0454_T1006	ST. MARYS RIVER - UNNAMED TRIBUTARY	STREAM	9.2	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000040504	Allen	INA0454_T1006	ST. MARYS RIVER - UNNAMED TRIBUTARY	STREAM	9.2	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000040504	Allen	INA0454_T1006	ST. MARYS RIVER - UNNAMED TRIBUTARY	STREAM	9.2	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000040504	Allen	INA0454_T1006	ST. MARYS RIVER - UNNAMED TRIBUTARY	STREAM	9.2	BIOLOGICAL INTEGRITY	Warm Water Aquatic Life	4A	25
GREAT LAKES	41000040504	Allen	INA0454_T1006	ST. MARYS RIVER - UNNAMED TRIBUTARY	STREAM	9.2	BIOLOGICAL INTEGRITY	Warm Water Aquatic Life	4A	25
GREAT LAKES	41000040504	Allen	INA0454_T1006	ST. MARYS RIVER - UNNAMED TRIBUTARY	STREAM	9.2	BIOLOGICAL INTEGRITY	Warm Water Aquatic Life	4A	25
GREAT LAKES	41000040604	Allen	INA0464_T1002	ST. MARYS RIVER - UNNAMED TRIBUTARY	STREAM	1.61	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000040604	Allen	INA0464_T1004	ST. MARYS RIVER - UNNAMED TRIBUTARY	STREAM	0.75	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000040604	Allen	INA0464_T1005	ST. MARYS RIVER - UNNAMED TRIBUTARY	STREAM	0.42	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000040604	Allen	INA0464_T1006	ST. MARYS RIVER - UNNAMED TRIBUTARY	STREAM	1.11	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000040606	Allen	INA0466_01	ST. MARYS RIVER (FOSTER PARK)	STREAM	0.37	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000050202	Allen	INA0522_02	WABASH AND ERIE CANAL	STREAM	1.75	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	24
GREAT LAKES	41000030706	Allen	INA0376_02	WILLOW CREEK	STREAM	9.32	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	51
GREAT LAKES	41000030706	Allen	INA0376_03	WILLOW CREEK	STREAM	2.94	ESCHERICHIA COLI (E. COLI)	Full Body Contact	4A	51

Threatened and Endangered Species

The State of Indiana harbors a great diversity of wildlife and plant communities. Many species receiving federal or state protection are tied closely to their habitats. Land-use change has been the most common cause for decline in species range and diversity. Contamination and degradation of natural waters has also contributed to loss of habitat. The Indiana Natural Heritage Data Center lists over 50 species as endangered, threatened or rare within Allen County. These species include a variety of mammals, birds, reptiles, amphibians, mollusks, insects, fish and plants (see Table 8-3). Species included in the list as federally Endangered in Allen County include the White Catpaw mussel, Northern Riffleshell mussel, Clubshell mussel, and Rayed Bean mussel. Also in Allen County, the Rabbitsfoot mussel and Eastern Massasauga reptile species are listed as federally threatened. Species in Allen County that are candidates for potential future listing as either federally threatened or endangered include the Round Hickorynut mussel, Spotted Turtle reptile, and Blanding's Turtle reptile. Due to the sensitive nature of identifying locations of threatened and endangered species, maps of these specific habitats are not provided. In general, small stream corridors with well-developed riparian woods, upland forested areas, wetlands and portions of the St. Joseph River have been identified as potential habitat sites to threatened and endangered species.

Projects going through the development process are planned and designed to comply with the National Environmental Policy Act, Endangered Species Act, Clean Water Act and appropriate Indiana rules and regulations. In the early coordination phase of a project, potential impacts to specific endangered or threatened species will be assessed. Avoidance and mitigation strategies will be developed for specific projects as needed. The mitigation strategies may include but are not limited to: restricting clearing of trees and vegetation; relocation of listed mussel and plant species from the construction site; strict erosion control; measures to allow terrestrial species to pass unharmed through construction areas; seasonal construction restrictions; limit construction noise; and limit hours of construction activity.

Table 8-3. Endangered, Threatened or Rare Species within Allen County

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Indiana County Endangered, Threatened and Rare Species List



Species Name	Common Name	FED	STATE	GRANK	SRANK
Allen					
Mollusk: Bivalvia (Mussels)					
<i>Alasmodonta viridis</i>	slippershell mussel		SSC	G4G5	S3
<i>Epioblasma perobliqua</i>	white catpaw	E	SE	G1	SX
<i>Epioblasma rangiana</i>	northern riffleshell	E	SE	G1	S1
<i>Lampsilis fasciola</i>	wavyrayed lampmussel		SSC	G5	S3
<i>Ligumia recta</i>	black sandshell		SSC	G4G5	S2
<i>Obovaria subrotunda</i>	round hickorynut	PT	SE	G4	S1
<i>Pleurobema clava</i>	Clubshell	E	SE	G1G2	S1
<i>Ptychobranhus fasciolaris</i>	Kidneyshell		SSC	G4G5	S2
<i>Theliderma cylindrica</i>	Rabbitsfoot	T	SE	G3G4	S1
<i>Toxolasma lividus</i>	Purple Lilliput		SSC	G3	S2
<i>Villosa fabalis</i>	Rayed Bean	E	SE	G2	S1
Insect: Odonata (Dragonflies & Damselflies)					
<i>Gomphurus fraternus</i>	Midland Clubtail			G5	S2
<i>Tachopteryx thoreyi</i>	Gray Petaltail		WL	G4	S3
Fish					
<i>Moxostoma valenciennesi</i>	Greater Redhorse		SE	G4	S2
<i>Percina evides</i>	Gilt Darter		SE	G4	S1
Amphibian					
<i>Acris blanchardi</i>	Blanchard's cricket frog		SSC	G5	S4
<i>Ambystoma laterale</i>	blue-spotted salamander		SSC	G5	S2
<i>Hemidactylum scutatum</i>	four-toed salamander		SSC	G5	S3
Reptile					
<i>Clemmys guttata</i>	spotted turtle	C	SE	G5	S2
<i>Clonophis kirtlandii</i>	Kirtland's snake		SE	G2	S3
<i>Emydoidea blandingii</i>	Blanding's turtle	C	SE	G4	S2
<i>Sistrurus catenatus</i>	eastern massasauga	T	SE	G3	S2
Bird					
<i>Accipiter striatus</i>	Sharp-shinned Hawk		SSC	G5	S2B
<i>Asio flammeus</i>	Short-eared Owl		SE	G5	S2
<i>Bartramia longicauda</i>	Upland Sandpiper		SE	G5	S3B
<i>Buteo platypterus</i>	Broad-winged Hawk		SSC	G5	S3B
<i>Certhia americana</i>	Brown Creeper			G5	S2B
<i>Chordeiles minor</i>	Common Nighthawk		SSC	G5	S4B
<i>Circus hudsonius</i>	Northern Harrier		SE	G5	S2
<i>Cistothorus palustris</i>	marsh wren		SE	G5	S3B
<i>Falco peregrinus</i>	Peregrine Falcon		SSC	G4	S2B
<i>Haliaeetus leucocephalus</i>	bald eagle			G5	S3
<i>Helmitheros vermivorus</i>	worm-eating warbler		SSC	G5	S3B
<div>Indiana Natural Heritage Data Center</div> <div>Division of Nature Preserves</div> <div>Indiana Department of Natural Resources</div> <div>This data is not the result of comprehensive county surveys.</div> <div> <div>Fed:</div> <div>State:</div> <div>GRANK:</div> <div>SRANK:</div> </div> <div> <div>E = Endangered; T = Threatened; C = candidate; PDL = proposed for delisting</div> <div>SE = state endangered; ST = state threatened; SR = state rare; SSC = state species of special concern; SX = state extirpated; SG = state significant; WL = watch list</div> <div>Global Heritage Rank: G1 = critically imperiled globally; G2 = imperiled globally; G3 = rare or uncommon globally; G4 = widespread and abundant globally but with long-term concerns; G5 = widespread and abundant globally; G? = unranked; GX = extinct; Q = uncertain rank; T = taxonomic subunit rank</div> <div>State Heritage Rank: S1 = critically imperiled in state; S2 = imperiled in state; S3 = rare or uncommon in state; S4 = widespread and abundant in state but with long-term concern; SG = state significant; SH = historical in state; SX = state extirpated; B = breeding status; S? = unranked; SNR = unranked; SNA = nonbreeding status unranked</div> </div>					

Table 8-3 Continued next page...

Table 8-3. Endangered, Threatened or Rare Species within Allen County -Continued

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Indiana County Endangered, Threatened and Rare Species List



Species Name	Common Name	FED	STATE	GRANK	SRANK
<i>Ixobrychus exilis</i>	Least Bittern		SE	G4G5	S3B
<i>Lanius ludovicianus</i>	loggerhead shrike		SE	G4	S2B
<i>Mniotilta varia</i>	Black-and-white Warbler		SSC	G5	S1S2B
<i>Nyctanassa violacea</i>	Yellow-crowned Night-heron		SE	G5	S2B
<i>Nycticorax nycticorax</i>	Black-crowned Night-heron		SE	G5	S1B
<i>Phalaropus tricolor</i>	Wilson's Phalarope		SSC	G5	SHB
<i>Setophaga cerulea</i>	Cerulean Warbler		SE	G4	S3B
<i>Setophaga citrina</i>	Hooded Warbler		SSC	G5	S3B
<i>Sturnella neglecta</i>	Western Meadowlark		SSC	G5	S2B
<i>Tyto alba</i>	Barn Owl		SE	G5	S2
<i>Vermivora chrysoptera</i>	Golden-winged Warbler	C	SE	G4	S1B
Mammal					
<i>Lasionycteris noctivagans</i>	Silver-haired Bat		SSC	G3G4	SU
<i>Lasiurus borealis</i>	Eastern red bat		SSC	G3G4	S4
<i>Myotis septentrionalis</i>	Northern Long Eared Bat	T; PE	SE	G2G3	S2S3
<i>Taxidea taxus</i>	American Badger		SSC	G5	S2
Vascular Plant					
<i>Andromeda glaucophylla</i>	bog rosemary		ST	G5T5	S2
<i>Carex cephaloidea</i>	thinleaf sedge		WL	G5	S2
<i>Carex decomposita</i>	cypress-knee sedge		ST	G3G4	S2
<i>Carex trichocarpa</i>	hairy-fruit sedge		WL	G4	S3
<i>Chelone obliqua</i> var. <i>speciosa</i>	rose turtlehead		WL	G4T3	S3
<i>Circaea alpina</i>	small enchanter's nightshade		SX	G5	SX
<i>Crataegus succulenta</i> var. <i>succulenta</i>	fleshy hawthorn		ST	G5T5	S3
<i>Cypripedium acaule</i>	pink lady's-slipper		SE	G5	S1
<i>Cypripedium parviflorum</i> var. <i>pubescens</i>	large yellow lady's-slipper		WL	G5T5	S3
<i>Dactylorhiza viridis</i>	long-bract green orchid		SE	G5	S1
<i>Hydrastis canadensis</i>	golden seal		WL	G3G4	S3
<i>Panax quinquefolius</i>	American ginseng		WL	G3G4	S3
<i>Phlox ovata</i>	mountain phlox		SE	G4	S1
<i>Platanthera psychodes</i>	small purple-fringe orchid		ST	G5	S3
<i>Poa alsodes</i>	grove meadow grass		WL	G4G5	S3
<i>Pyrola elliptica</i>	elliptical-leaf wintergreen		WL	G5	S3
<i>Rorippa aquatica</i>	lake cress		SE	G4?	S1
<i>Scutellaria parvula</i> var. <i>parvula</i>	small skullcap		SE	G4T4	S1
<i>Spiranthes lucida</i>	shining ladies'-tresses		ST	G4	S3
<i>Spiranthes magnicamporum</i>	Great Plains ladies'-tresses		SE	G3G4	S2S3
<i>Symphotrichum boreale</i>	rushlike aster		ST	G5	S2
High Quality Natural Community					
Forest - flatwoods black swamp	Black Swamp Flatwoods		SG	GNR	S1

Indiana Natural Heritage Data Center
Division of Nature Preserves
Indiana Department of Natural Resources
This data is not the result of comprehensive county surveys.

Fed: E = Endangered; T = Threatened; C = candidate; PDL = proposed for delisting
State: SE = state endangered; ST = state threatened; SR = state rare; SSC = state species of special concern; SX = state extirpated; SG = state significant; WL = watch list
GRANK: Global Heritage Rank: G1 = critically imperiled globally; G2 = imperiled globally; G3 = rare or uncommon globally; G4 = widespread and abundant globally but with long-term concerns; G5 = widespread and abundant globally; G? = unranked; GX = extinct; Q = uncertain rank; T = taxonomic subunit rank
SRANK: State Heritage Rank: S1 = critically imperiled in state; S2 = imperiled in state; S3 = rare or uncommon in state; S4 = widespread and abundant in state but with long-term concern; SG = state significant; SH = historical in state; SX = state extirpated; B = breeding status; S? = unranked; SNR = unranked; SNA = nonbreeding status unranked

Table 8-3 Continued next page...

Table 8-3. Endangered, Threatened or Rare Species within Allen County -Continued

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01/13/2023

Indiana County Endangered, Threatened and Rare Species List



Species Name	Common Name	FED	STATE	GRANK	SRANK
Forest - flatwoods central till plain	Central Till Plain Flatwoods		SG	G3	S2
Forest - floodplain mesic	Mesic Floodplain Forest		SG	G3?	S1
Forest - floodplain wet-mesic	Wet-mesic Floodplain Forest		SG	G3?	S3
Forest - upland dry Central Till Plain	Central Till Plain Dry Upland Forest		SG	GNR	S1
Forest - upland dry-mesic Central Till Plain	Central Till Plain Dry-mesic Upland Forest		SG	GNR	S2
Forest - upland mesic Central Till Plain	Central Till Plain Mesic Upland Forest		SG	GNR	S3
Lake - pond	Pond		SG	GNR	SNR
Prairie - dry-mesic	Dry-mesic Prairie		SG	G3	S2
Wetland - marsh	Marsh		SG	GU	S4
Wetland - swamp forest	Forested Swamp		SG	G2?	S2
Wetland - swamp shrub	Shrub Swamp		SG	GU	S2
Other Significant Feature					
Geomorphic - Nonglacial Erosional Feature - Water Fall and Cascade	Water Fall and Cascade			GNR	SNR

Indiana Natural Heritage Data Center
Division of Nature Preserves
Indiana Department of Natural Resources
This data is not the result of comprehensive county surveys.

Fed: E = Endangered; T = Threatened; C = candidate; PDL = proposed for delisting
State: SE = state endangered; ST = state threatened; SR = state rare; SSC = state species of special concern; SX = state extirpated; SG = state significant; WL = watch list
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Section 4(f) Mitigation

Section 4(f) of the Department of Transportation Act of 1966 requires that special effort be made to preserve public park and recreation land, wildlife and waterfowl refuges, and historic sites. In general, Section 4(f) specifies that federally funded transportation projects requiring the use of land from a public park, recreation area, wildlife and waterfowl refuge or land of significant historical value can only occur if there is no feasible and prudent alternative. Using Section 4(f) land requires all possible planning to minimize harm. The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), provided the first substantive revision to Section 4(f) to simplify the process and approval of projects that have only de minimis impacts on lands impacted by Section 4(f). Under the new provisions, once the US DOT determines that a transportation use of Section 4(f) property results in a de minimis impact, analysis of avoidance alternatives are not required and the Section 4(f) evaluation process is complete.

The NIRCC Metropolitan Planning Area contains a number of local parks; wildlife and waterfowl refuges; and sites listed on the national registry and are identified on Figures 8-6, 8-7 and 8-8. Additional historic locations including local districts and the Wabash-Erie Canal alignment are also identified on Figures 8-7 and 8-8. It is important to acknowledge that the identification of historic and cultural resources is a dynamic process and is therefore impossible to identify an exhaustive list of sites. These sites are important to the environmental integrity and heritage of our communities. However, there are times when transportation projects impact Section 4(f) resources and require measures to minimize potentially adverse impacts. The development and implementation of such measures involve close coordination with officials that have jurisdiction of the specific resources.

Investigation of Section 4(f) resources and investigation of potential impacts occur throughout the project planning and development. The intent of evaluating resources near project development sites helps guide projects toward practical solutions while minimizing impacts. This also applies to situations where no feasible or prudent alternative exists. The availability of detail during the project development of the preferred alternative allows for closer examination of the potential for Section 4(f) impacts and a clearer determination of how impacts should be processed. Once this is known, project sponsors and officials that own the resources can follow a process for mitigation.

The development process for the Transportation Plan is cognizant of and accounts for regional Section 4(f) resources that are important for preservation and community cohesion. Other resources may not be well known, but are afforded the same protection under Section 4(f). While the transportation planning process can account for well-known Section 4(f) resources that would pose a significant loss if impacted, it is premature to analyze individual impacts from projects at this stage in the planning process.

In cases where projects do have Section 4(f) impacts and there is no feasible and prudent alternative to avoid use of the resource, the project development process requires consideration of all possible actions to minimize harm. Minimization of harm may entail both alternative design modifications that lessen the impact and mitigation measures that compensate for residual impacts. Minimization and mitigation measures should be determined through consultation with the official or agency owning or administering the resource. Neither the Section 4(f) statute nor regulation requires the replacement of Section 4(f) resources used for transportation projects, but this option is appropriate

as a mitigation measure for direct project impacts.

Mitigation measures involving public parks, recreation areas, or wildlife and waterfowl refuges may involve a replacement of land and/or facilities of comparable value and function, or monetary compensation, which could be used to enhance the remaining land. Mitigation of historic sites usually consists of those measures necessary to preserve the historic integrity of the site. In any case, the cost of mitigation should be a reasonable public expenditure in light of the severity of the impact on the Section 4(f) resource in accordance with Federal requirements. Mitigation for common Section 4(f) resource impacts may include: landscaping or other screening techniques; context sensitive design refinements; maintenance of traffic accommodations to minimize impacts; minimize noise and/or limit duration of construction; and direct compensation for improvements to on-site resources.

Cultural Resources

Cultural resource reviews during the project development phase are designed to comply with the National Environmental Policy Act, the National Historic Preservation Act, the Department of Transportation Act and applicable Indiana codes and regulations. These laws and regulations require that cultural resources be considered during the development of transportation projects. An element of that consideration involves consulting with various entities including the Federal Highway Administration (FHWA), Advisory Council on Historic Preservation (ACHP), State Historic Preservation Office (SHPO), local historic preservation groups, local public officials, and the public.

Mitigation measures developed through a Section 106 Memorandum Of Agreement (MOA) consultation process provide ways to avoid, minimize, or mitigate adverse effects to historic properties impacted by projects. Historic properties include those listed, or are eligible for listing in the National Register of Historic Places (NRHP). These mitigation measures are carried through as environmental document commitments and must be completed and accounted for with SHPO and FHWA. The MOA will not be closed until all stipulations are fulfilled. A failure to meet all stipulations can potentially jeopardize a project sponsor's funding or other agreements or projects.

A plan for mitigating an adverse effect is site/property specific and requires a separate research design or approach for each historic property impacted by the project. It should be based on the context development and refinement through the environmental assessment and preliminary project design/engineering.

Mitigation measures may involve a variety of methods including, but not limited to: aesthetic treatments; avoidance; archaeological data recovery; creative mitigation; salvage and re-use of historic materials; informing/educating the public; and Historic American Buildings Survey (HABS)/Historic American Engineering Record (HAER) documentation. Approaches vary widely depending on the type of historic property, the qualities that enable the property to meet

the NRHP Criteria of Eligibility, the location of the historic property with respect to the project and other criteria specific to the site. Mitigation plans are developed in consultation with Indiana Department of Transportation, State Historic Preservation Office, Federal Highway Administration,

local public officials, local historic preservation groups, and the public. In special circumstances consultation may include the Advisory Council on Historic Preservation.

Using INDOT's Red Flag Investigation Template NIRCC has identified a number of other cultural resources and infrastructure that may impact transportation projects. Figure 8-9 identifies the following sites, facilities, and infrastructure: Cemeteries, railroads, pipelines (containing natural gas, crude oil, and refined oil), airports, hospitals, religious centers, recreational facilities, museums, and schools. Further investigation at a project development stage needs completed in order to know if there will be issues that need addressed or some type of mitigation that may be required. Mitigation for these types of issues may include alternative alignments or treatments, context-sensitive design, noise barriers, or other enhancements depending on the affect and proximity of a project to these types of features.

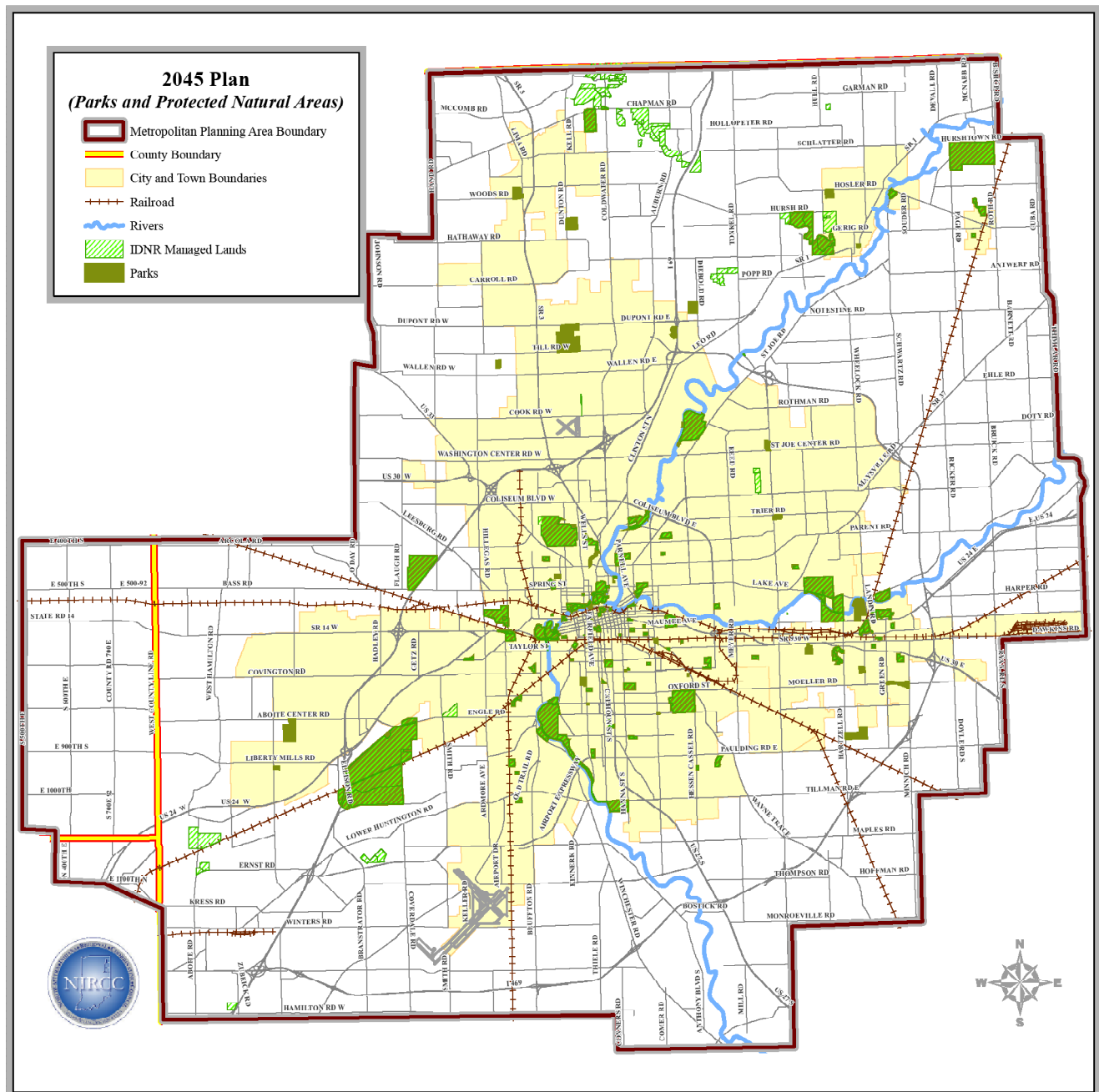


Figure 8-6
Parks and Significant Protected Natural Areas

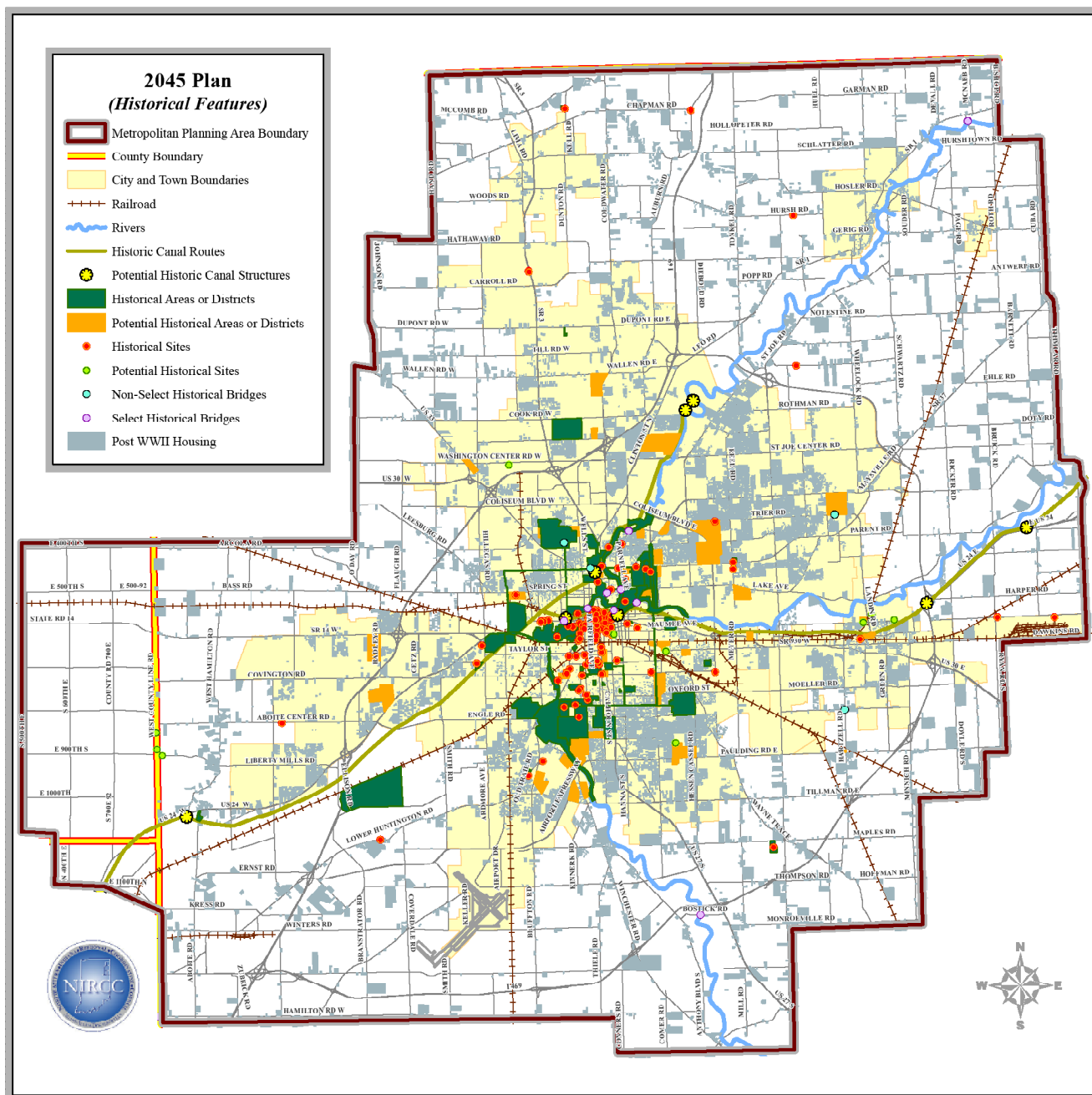


Figure 8-7
Historic Features

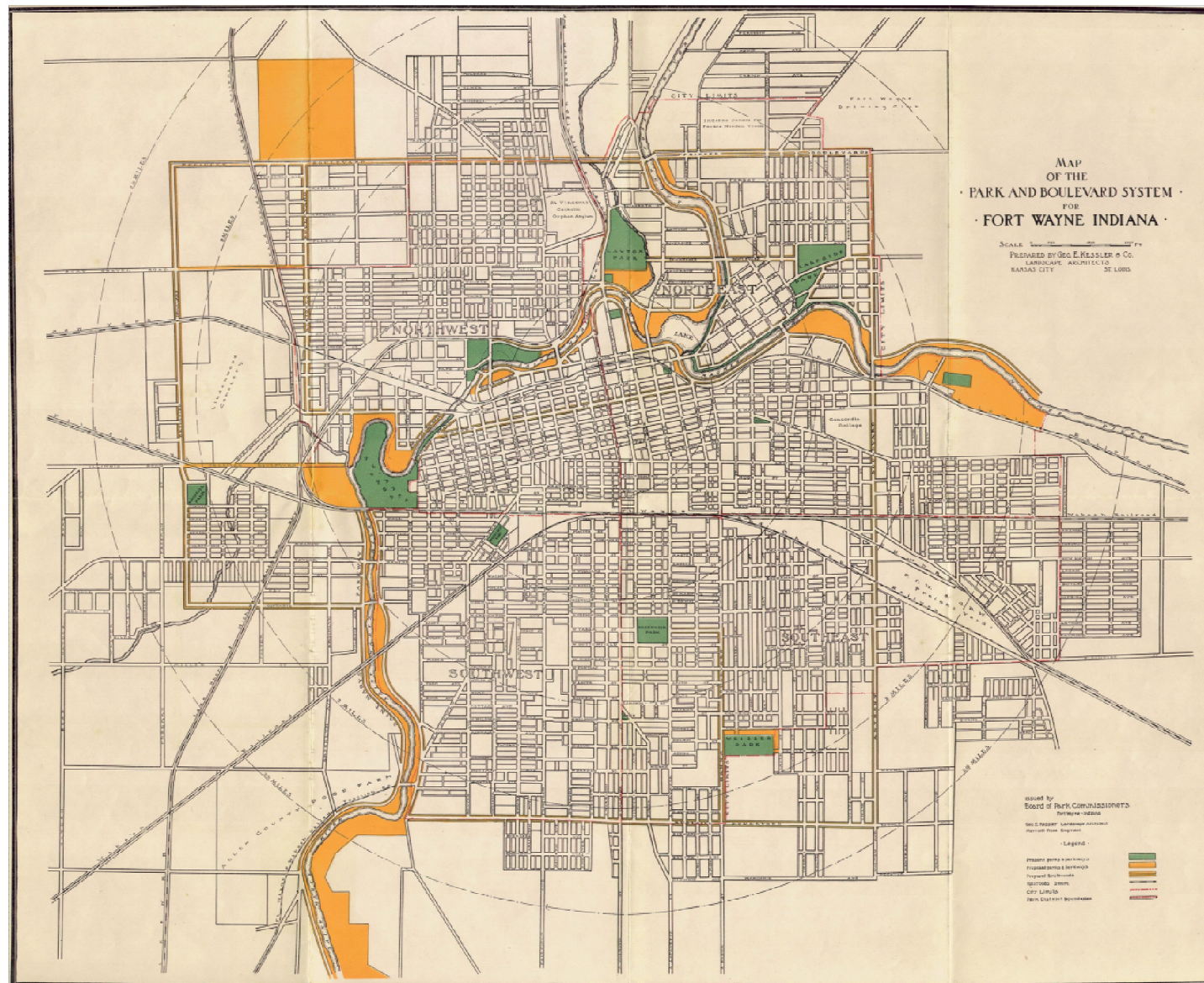


Figure 8-8

Kessler Plan - Park and Boulevard System

Attachment

2

Multiple Property
Document

**Map of the
Park and Boulevard System
City of Fort Wayne, Indiana
George Kessler, 1912**

PREPARED BY:

**TINA JONES
CHRISTOPHER BAAS
MALCOLM CAIRNS**

PREPARED FOR:

**ARCH
437 EAST BERRY
STREET, SUITE 204
FORT WAYNE,
INDIANA 46802**

(260)426-5117



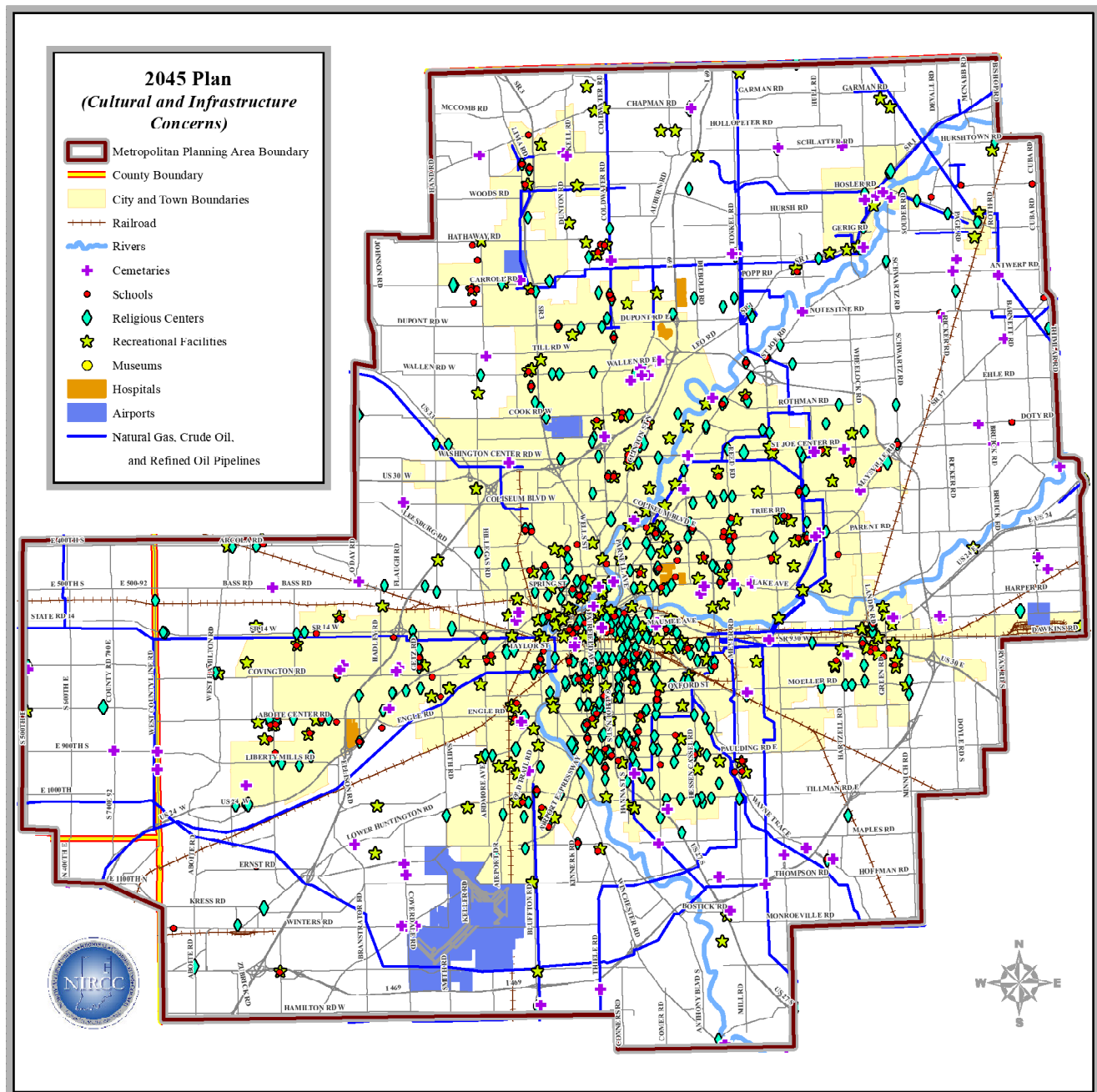
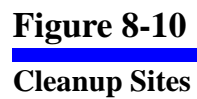


Figure 8-9
Cultural and Infrastructure Concerns

Other Environmentally Sensitive Sites

The Northeastern Indiana Regional Coordinating Council has identified other potential sites that have varying degrees of environmental sensitivity and may impact project development. Using a similar format as INDOT's Red Flag Investigation Template NIRCC has identified the following environmentally sensitive sites (see Figures 8-10 through 8-13): Confined feeding operations, open dump waste sites, waste treatment storage and disposal sites, tire waste sites, construction and demolition waste sites, solid waste sites active and permitted, NPDES (National Pollutant Discharge Elimination System) facilities and pipes, notice of contamination sites, superfund sites, brownfield sites, cleanup sites, VRP (Voluntary Remediation Program) sites, institutional controls, underground storage tanks, and manufactured gas plants. These locations will be treated on a project by project basis by avoidance or mitigation strategies. Projects impacting these sites will incur additional expense to dispose or treat contaminated soils and materials.

Public water source wellhead protection/influence areas are not displayed due to security issues. To evaluating potential impacts from specific projects or groups of projects NIRCC uses IDEM's Source Water Proximity Determination Tool available on IDEM's website. Appropriate mitigation activities will be implemented in wellhead influence areas as deemed necessary by IDEM. Mitigating, controlling and containing highway run-off and potential hazardous roadway spills are examples of strategies to protect wellhead sites.





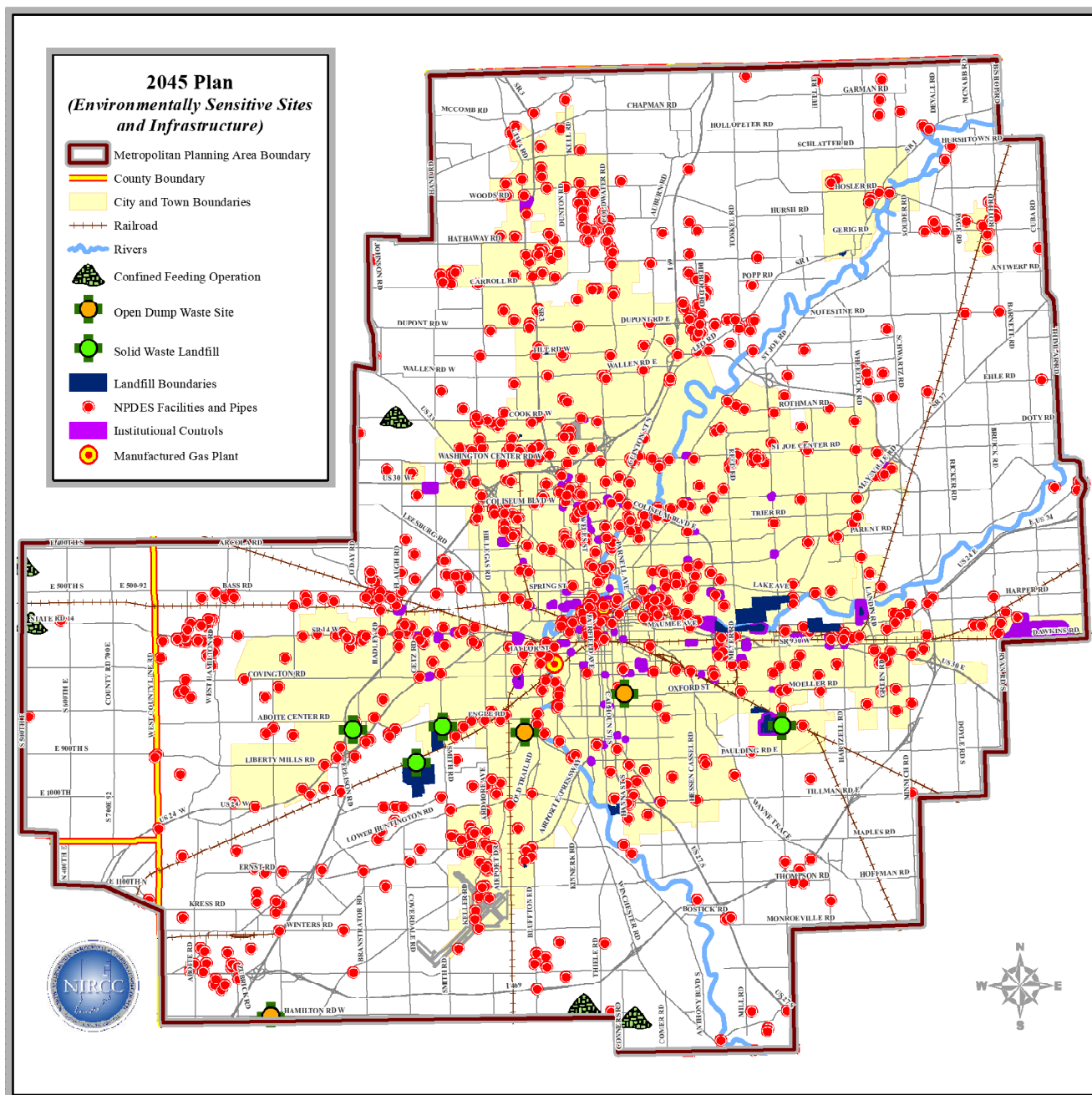


Figure 8-12
Enviromentally Sensitive Sites And Infrastructure

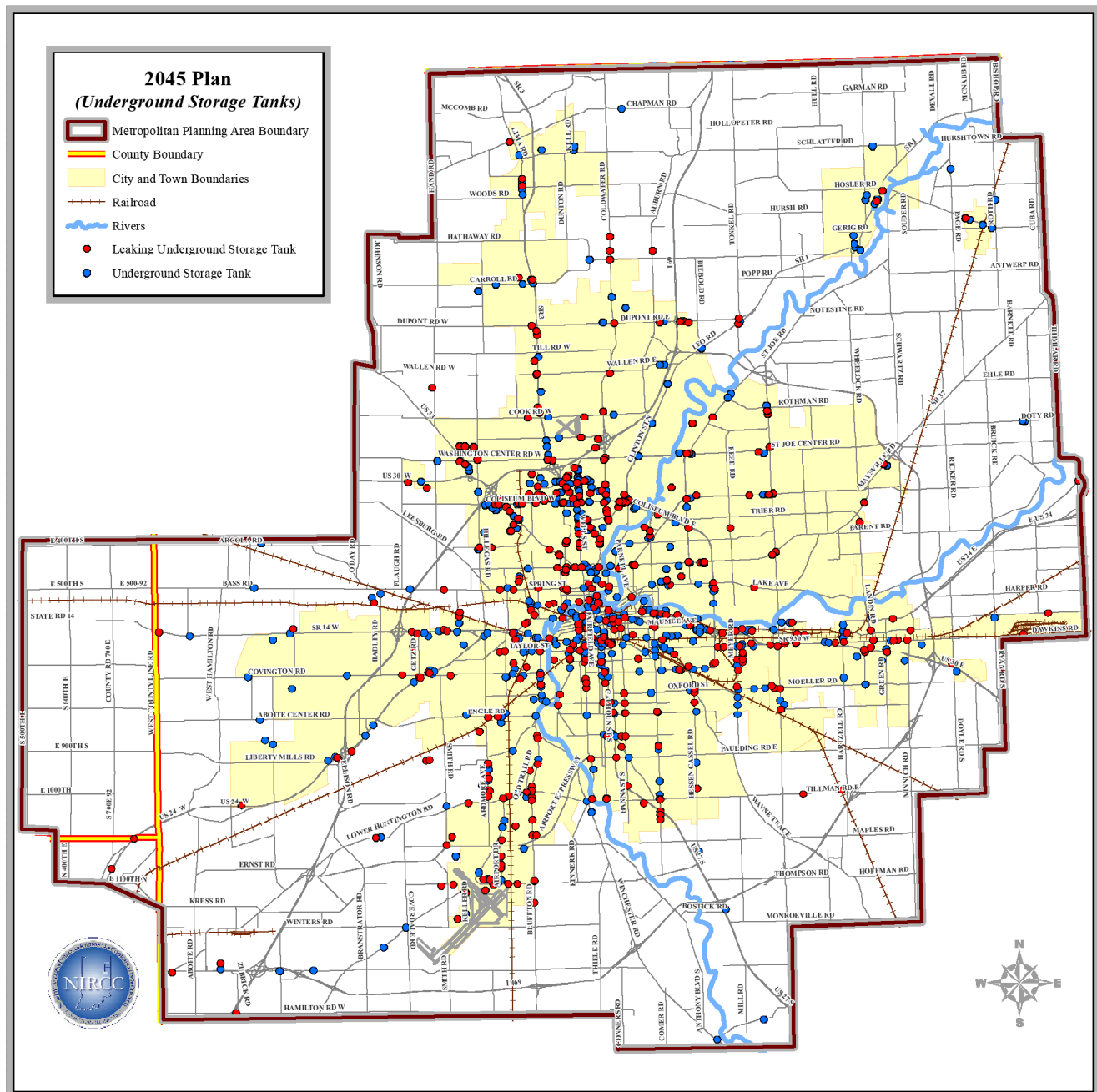


Figure 8-13
Underground Storage Tanks

Transportation Plan Analysis Summary

The maps provided in this document show the locations of various environmentally sensitive sites within the NIRCC Metropolitan Planning Area. The 2045 Transportation Plan includes 67 individual projects throughout the region. This section summarizes how many of these projects are near the environmentally sensitive locations. This information is only provided to show how common it is that an environmental issue is expected to be addressed and mitigated as projects from the Transportation Plan progress through the project development process.

The following method was used to summarize the number of projects near common environmental issue locations. Buffers were developed around the transportation projects at 100 feet, 500 feet, and 1,000 feet. Depending on the environmental issue and the limited certainty of some site locations or area boundaries, the 1,000 foot buffer distance may be the best option for knowing the potential needs of addressing impacts to a project. Features like special interest waterways and oil or gas mines are examples of projects that may need to use these 1,000 foot buffer distances because locations may be approximate and because the environmental sensitivity to these areas may not be well known. Other environmental issues identified such as parks and significant natural areas, historic sites, potential wetlands, brownfields, landfills, Superfund sites, etc. may be adequately served by the 100 foot and 500 foot buffers.

Table 8-4 summarizes the number of projects from the 2045 Transportation Plan that are near each type of environmental issue within the selected buffer criteria. All Environmental Document Data Citations are listed in Appendix L.

Table 8-4. Summary of number of Projects within Environmental Points of Interest

Environmental Points of Interest Near Transportation Projects	Number of Projects within 100 ft	Number of Projects within 500 ft	Number of Projects within 1,000 ft
Hazmat Concerns			
Confined Feeding Operations	1	1	1
Waste Sites (industrial waste sites, waste treatment storage and disposal sites, septage waste sites, tire waste sites, construction and demolition waste sites, solid waste sites active and permitted)	6	9	14
Landfill Sites (composting facilities, open dumps, old landfill sites, landfill sites)	0	0	2
NPDES (National Pollutant Discharge Elimination System) (NPDES facilities and pipes)	13	25	35
Cleanup Sites (corrective action sites, superfund sites, brownfield sites, cleanup sites, VRP sites)	0	1	4
Institutional Controls	8	11	15
Underground Storage Tanks (underground and leaking underground storage tanks)	18	32	38
Manufactured Gas Plants	0	0	0
Water Resources			
Water Features (lakes, ponds, creeks, streams, ditches)	42	56	62
Wetlands (wetland areas, wetland streams, wetland points)	30	45	56
Floodplain	22	31	34
Line of Protection	1	2	2
Special Interest Water Features/Resources (impaired lakes and streams, national river inventory (NRI, NPS), Outstanding Rivers)	12	16	20

Table 8-4 Continued next page...

Table 8-4. Summary of number of Projects within Environmental Points of Interest - Continued

Environmental Points of Interest Near Transportation Projects	Number of Projects within 100 ft	Number of Projects within 500 ft	Number of Projects within 1,000 ft
Infrastructure			
Cemeteries	6	14	16
Railroads	7	10	13
Pipelines	17	25	31
Airports and Hospitals	2	2	2
Cultural and Recreational Facilities (religious centers, recreational facilities, museums)	13	26	36
Schools	14	19	21
Existing or Potential Trails	43	45	47
Historical Features, Parks, and Significant Protected Natural Areas			
Historical Canal (potential historic canal routes and structures)	4	5	5
Historical Bridges (select and Non-Select)	0	0	0
Historical Sites and Districts	3	4	9
Parks and Significant Protected Natural Areas	5	7	12
Mining and Mineral Exploration			
Oil or Gas Wells, Mineral Resources, Mines	2	4	4

Climate Change: Resilient and Sustainable Transportation

The Purdue Climate Change Research Center has prepared a report titled *Indiana's Past & Future Climate: A Report from the Indiana Climate Change Impacts Assessment* (March 1, 2018). The report documents how climate change is affecting Indiana and the corresponding impacts of extreme events. The report indicates that the trends are clear, Indiana's temperatures are rising, and precipitation is increasing. Of specific concern is the speed in which these trends appear to be changing and the effect on public infrastructure and urban environments.

Extreme Events

For Indiana, including Allen County, the effect of climate change will be extreme temperature events and precipitation extremes that affect stormwater resulting in stream and river flooding. Extreme cold events are anticipated to decrease, and the last frost of the spring will occur earlier in the year. And while the trend data for extreme hot temperature days is somewhat skewed from 1925 to present from the 1930s drought years, as average temperatures warm, the number of extreme heat events is expected to rise.

The risk to roadway pavement as elevated temperatures may impact the amount of warping and buckling during extreme heat events is noted in the report. Modifications to pavement materials to improve tolerance of high heat conditions should be considered as the number of extreme heat events increase.

An extreme rainfall event is defined as "having a daily rainfall total in the top 1 percent of all events." Statewide, this is represented when 0.86 inches of rain falls in one day. A notable increase in the number of days experiencing extreme rainfall has occurred since 1990. Extreme rainfall affects roadway infrastructure with stormwater retention and runoff, roadway flooding, and potential damage to bridges.

The report states that in the Midwest, extreme events are occurring more frequently and exhibiting higher rainfall totals during these events. Within the Midwest, the average increase of precipitation during the top 1 percent of events from 1958 to 2016 is 42 percent. The measured increase validates what has been observed in Indiana.

As temperatures rise, the extreme rainfall events are expected to intensify throughout the remainder of this century. Scientists anticipate the average number of days that experience extreme precipitation events will increase by one or two days each year. In addition, the Midwest should anticipate more severe storm events.

Indiana has an approximately 15 tornadoes per year that rate at least EF1 on the Enhanced Fujita scale. The Enhanced Fujita scale rates tornadoes from an EF1 to an EF5. An EF1 tornado has winds between 86 and 110 miles per hour and EF5 tornadoes exhibit winds in excess of 200 miles per hour. While tornadoes can occur in any month, they are more likely to occur in April through June. Tornado activity varies year to year so a trend cannot be established.

The report suggests that warming temperatures may lengthen the storm season, but predicting increased or more severe storms is difficult. There is evidence the components that lead to storm development, such as instability and vertical wind shear, are likely to increase. Based on recent models, early results indicate that storm frequency and intensity is likely, but more study is needed, and research is underway.

The important takeaways from the research included in *Indiana's Past & Future Climate: A Report from the Indiana Climate Change Impacts Assessment* (March 1, 2018) are that Indiana's climate has been changing for over a hundred years, and more rapidly over the past few decades. The change is likely to accelerate as temperatures rise primarily impacting summer weather events. Hot days with record breaking temperatures are expected to increase. The winter and spring are expected to be wetter with more intense and frequent precipitation events. Additional research and data is required to enhance the climate change

models and produce more reliable predictions of the impacts. The report and additional climate change information and related data is available at [IndianaClimate.org](https://indianacclimate.org).

This leads us to several questions relevant to the transportation planning process and transportation plan. First, how to adapt our transportation system to mitigate and recover from the adverse impacts of climate change and secondly, how to reduce greenhouse gas emissions from transportation to slow the rate of climate change? The answer to these questions is to incorporate greenhouse gas reduction and resiliency strategies into transportation policies and the design, construction, and placement of transportation infrastructure. These actions will encourage sustainable travel and a resilient transportation network.

Recognizing hotter summer days and increased frequency and intensity of storms with extreme precipitation events are the primary impacts of climate change in Northeast Indiana, mitigating the adverse effects of excessive heat, stormwater runoff, flooding, snowfall, and storm damage are important to address. Impacts to the transportation system include more frequent flooding events that potentially shorten the life of bridges, culverts, drainage structures, and roadways. Hotter temperatures can impact thermal expansion of pavement causing degradation and reduced service life, shortening replacement cycles. Storms and extreme precipitation events can impact roadway safety and increase the risk of vehicle crashes.

Resilient and Sustainable Infrastructure Policies

- Prioritize vulnerable critical infrastructure for adverse impacts of climate change with appropriate attention to environmental justice areas.
- Adjust stormwater flow calculations to account for increased rainfall events, appropriately size stormwater infrastructure and detention to accommodate additional flow and implement stormwater control measures that improve water quality.
- Continue to expand the number of publicly available electric vehicle charging stations.
- Where practical, convert municipally owned vehicle fleets to electric vehicles.
- Support Citilink's conversion to an energy efficient transit fleet with low or no emissions.
- Promote carpooling, other shared ride options, and car share programs.
- Continue the conversion of streetlights to low energy consuming, light-emitting diodes (LED).
- Incorporate streetscapes that support a robust urban tree canopy to reduce heat islands and mitigate stormwater runoff.
- Promote high density land uses and transit friendly development designs to encourage transit ridership.
- Encourage mixed-use developments that blend housing, retail stores, and businesses in neighborhoods to reduce vehicle trips.
- Construct trails and sidewalks to promote a multi-modal transportation network.
- Expand the network of active transportation infrastructure (sidewalks, trails, bike lanes, etc.).
- Adapt bridge structures and roadway approaches to prevent closure during flooding events.
- Identify infrastructure designs that tolerate higher temperatures and more frequent freeze-thaw events.
- Support the implementation and expansion of the City of Fort Wayne Climate Action and Adaptation Plan (April 2023).
- Continue implementing complete streets.
- Analyze implementation of methods and upgrades to ensure improvements are distributed in a fair and equitable manner.

List of Consulting Agencies

ARCH - Historic Preservation
Allen County Parks Department
Allen County Soil and Water Conservation District
Department of the Army, Detroit District, Corps of Engineers Environmental
Department of the Army, Detroit District, Corps of Engineers Environmental - Analysis Branch
Department of the Army, Louisville Corps of Engineers
Federal Highway Administration - Indiana Division
Fort Wayne Community Development-Historic Preservation
Fort Wayne Parks Department
Indiana Department of Environmental Management
Indiana Department of Natural Resources
Indiana Department of Natural Resources - Division of Fish and Wildlife
Indiana Department of Natural Resources - Division of Historic Preservation and Archaeology
Indiana Department of Natural Resources - Division of Nature Preserves
Indiana Department of Natural Resources - NE Region Ecologist
Indiana Department of Transportation - Fort Wayne District
Indiana Department of Transportation - Central Office
Indiana Geological Survey
Indiana Natural Resources Conservation Services
Maumee River Basin Commission
U.S. Department of Housing and Urban Development
U.S. Department of the Interior, National Park Service - Regional Director
U.S. Environmental Protection Agency - Region V
U.S. Environmental Protection Agency - Region V-Superfund
U.S. Fish and Wildlife Service

Input on 2045 Metropolitan Transportation Plans by the Consulting Agencies

Opportunity to comment on the Environmental Mitigation Activities and 2045 Metropolitan Transportation Plan was afforded to the consulting agencies. Comments were received from the Indiana Department of Natural Resources, Division of Fish and Wildlife. The comments and reactions to the comments are provided below.

Indiana Department of Natural Resources, Division of Fish and Wildlife

Comment: Regarding endangered, threatened, or rare species. The lists of species have been recently updated. Please look at links provided here: <https://www.in.gov/dnr/fish-and-wildlife/nongame-and-endangered-wildlife/>.

Response: The list of endangered, threatened, or rare species has been updated.

Comment: Regarding LED Lighting. Most transportation corridor designers and municipalities are trending toward LED lighting. Certain types of LED lighting can have negative impacts on both human and wildlife health and safety. Scientific evidence suggests that artificial light at night has negative and deadly effects on many organisms including amphibians, birds, mammals, insects and plants (<https://www.darksky.org/light-pollution/wildlife/>). A June 2016 American Medical Association (AMA) report, "Human and Environmental Effects of Light Emitting Diode Community Lighting," concluded that "white LED street lighting patterns may contribute to the risk of chronic disease in the populations of cities in which they have been installed."

The International Dark-Sky Association has developed recommendations (<https://www.darksky.org/our-work/lighting/lighting-for-citizens/led-guide/>) for communities choosing LED lighting systems that will aid in the selection of lighting that is energy and cost efficient, yet ensures safety and security, protects wildlife, and promotes the goal of reducing light pollution:

- Always choose fully shielded fixtures that emit no light upward.
- Use "warm-white" or filtered LEDs (CCT < 3,000 K; S/P ratio < 1.2) to minimize harmful blue light emission.
- Look for products with adaptive controls like dimmers, timers, and motion sensors.
- Consider dimming or turning off lights during non-peak overnight hours.
- Avoid the temptation to over-light because of the higher luminous efficiency of LEDs.
- Only light the exact space and in the amount required for particular tasks.

Response: NIRCC will encourage state and local project designers to incorporate the International Dark-Sky Association recommendations for lighting into their projects.

Comment: Regarding Drainage and Stormwater Management. The Division of Fish & Wildlife recommends considering a more sustainable approach to stormwater management. The traditional model of stormwater management aims to drain runoff as quickly as possible with the help of channels and pipes, which increases peak flows and costs of stormwater management. This type of solution only transfers drainage problems from one section of a basin to another. A more sustainable approach should aim to rebuild the natural water cycle by using storage techniques (retention basins, constructed wetlands, raingardens, etc.) and recharging groundwater using infiltration techniques (infiltration basins or trenches, pervious pavement, etc.). The following links give a good overview of traditional and sustainable stormwater management systems and their pros and cons for consideration during the design of the proposed project: <https://www.epa.gov/greeningepa/epa-facility-stormwater-management>; <https://www.epa.gov/greeningepa/stormwater-management-practices-epa-facilities>.

Response: Stormwater management and mitigation are designed into our urban projects in accordance with IDEM and EPA regulations. Additional efforts will be made to encourage green infrastructure that reduce runoff and improve water quality.

Comment: Regarding landscaping on roadway projects. Consider using native plants for any proposed on-site landscaping and revegetation. While trees were specifically mentioned in the plan, utilizing native grasses and forbs (flowers) can be beneficial and in some cases have much greater benefits to combating the urban heat index and slowing stormwater runoff than trees alone. Further, habitat loss is the number 1 reason for loss of wildlife globally followed by invasive species. Planting native species can help to provide habitat to many species of wildlife, including those that are threatened and endangered. The following is a link to information on landscaping with native plants on the Indiana Native Plant Society (INPS) website: <https://indiananativeplants.org/landscaping/>.

Response: NIRCC will encourage state and local project designers to incorporate native plants including grasses and forbs into their landscape designs.

Input on previous Metropolitan Transportation Plans by the Consulting Agencies

Opportunity to comment on the Environmental Mitigation Activities was afforded to the consulting agencies on two separate occasions. Input from this process was used to modify and improve this section of the Transportation Plan. Comments were received from the Indiana Department of Natural Resources, State Historical Preservation Office; Indiana Department of Natural Resources, Division of Fish and Wildlife; Indiana Department of Transportation, Environmental Services, Fort Wayne District; Architecture and Community Heritage-ARCH, Incorporated or Fort Wayne; and United States Department of Army, Detroit District, Corps of Engineers. The comments and reactions to the comments are provided below.

United States Department of Army, Detroit District, Corps of Engineers

Comment: A portion of the Metropolitan Planning Area (west of I-69) is within the boundaries of the Corps Louisville District. When individual projects are coordinated, please send those projects within the Louisville District to: U.S. Army Corp of Engineers, Louisville District, ATTN: Chief Regulatory Branch (CELRL-OR-L), P.O. Box 59, Louisville, Kentucky 40201-0059. Please send projects within the Detroit District area to: U.S. Army Corp of Engineers, Detroit District, Planning Office-Environmental Analysis Branch, 477 Michigan Avenue, Detroit, Michigan 48226-2550.

Comment: The Detroit District Corps has a major flood control project in Fort Wayne that several of the projects in the transportation plan will intersect. These include:

New Construction: Spring Street –Wells Street to Spy Run Avenue Road Widening: State Boulevard-Clinton Street to Cass Street

In addition projects upstream and downstream could affect water levels in flood control project area. We will need to review more specific information for these projects that directly affect or may indirectly affect the Flood Control Project in order to ensure that the project plans do not compromise the Flood Control Project.

Comment: Many of the Transportation Plan projects cross waterways, we recommend that you coordinate with local officials and with the Indiana Department of Natural Resources regarding the applicability of a floodplain permit prior to construction. This coordination would help insure compliance with local and state floodplain management regulations and acts, such as the Indiana Flood Control Act (IC 13-2-22). Additionally, the Federal Emergency Management Agency Flood Insurance Rate Maps provide a good source of floodplain information. If you obtain any information that any part of your project would in fact impact the flood plain, you should consider other sites. This would be consistent with current Federal policy to formulate projects that, to the extent possible, avoid or minimize adverse impacts associated with use of the floodplain.

Indiana Department of Natural Resources, State Historical Preservation Office

Comment: Pursuant to the National Environmental Policy Act, Section 6002 of the Safe, Accountable, Flexible, and Efficient Transportation Equity Act, and Section 106 of the National Historic Preservation Act, the staff of the Indiana State Historic Preservation Officer (“Indiana SHPO”) has reviewed your letter dated October 4, 2012 and received on October 9, 2012 regarding the development of a transportation plan for the New Haven-Fort Wayne-Allen County Metropolitan Area in Allen, Huntington and Whitley counties, Indiana. Thank you for the notification of updates to the 2030-II Transportation Plan and invitation to discuss and consult on the plan development.

It is our understanding that cultural resource reviews will be conducted as necessary during the project development phase. The Indiana SHPO wished to consult on the specific projects for which our office has jurisdiction, as they develop under the plan.

Indiana Department of Natural Resources, Division of Fish and Wildlife

The agency responded with acknowledgement of receiving the request to participate and would review the draft document. No additional comments were submitted from the IDNR-Division of Fish and Wildlife.

Architecture and Community Heritage-ARCH, Incorporated of Fort Wayne

NIRCC staff met on several occasions with representative of ARCH during the development of the Transportation Plan. ARCH was extremely helpful in identifying existing and potential historic and cultural resources within the metropolitan planning area. Work continues on developing an updated inventory of historic resources within Allen County. NIRCC will continue to meet with ARCH representatives as the inventory is completed to update maps with the best available information. NIRCC intends to include ARCH representatives in the review process for Environmental Red Flag Surveys to gain their input at the earliest stages of project development. ARCH did not submit any formal comments, but provided valuable information and has agreed to work with NIRCC on the Red Flag Analyses.

Indiana Department of Transportation, Environmental Services, Fort Wayne District

In addition to the inclusion of “Indiana Listing of Outstanding Rivers and Streams,” you could include IDNR trout stream and USACE Section 10 stream, which usually require special considerations. The following is a list of the rivers which fall in these categories:

- Cedar Creek from river mile 13.7 to St. Joseph River (IDNR Scenic; IDEM)

- Cedar Creek (IDNR Outstanding)

- Little River (IDNR Outstanding; Sect 10)

- Maumee River- Hosey Dam in Ft. Wayne (USACE Sect 10)

- Shoaff Park (Trout 2017)

- Spy Run Creek (Trout 2017)

- Wabash from IN/OH line to Ohio River (IDNR Outstanding)

In the last paragraph under the Streams and Wetland sections, I believe it would be useful to include IDNR and their mitigation requirements as well. If a project is taking place in an IDNR regulated floodplain, then mitigation specific to the IDNR may be required. I see that this was also a comment from the United States Department of Army, Detroit District, Corps of Engineers. IDNR’s mitigation guidelines are outlined in their “Information Bulletin #17 Third Amendment.”