



TABLE OF CONTENTS

3.18 Wetland Impacts	2
3.18.1 Introduction	2
3.18.1.1 Mid-States Project Area High Quality Wetland Complexes.....	2
3.18.2 Methodology.....	3
3.18.3 Analysis	4
3.18.4 Mitigation.....	6
3.18.5 Summary	6

FIGURES

Figure 3.18-1: Palustrine Emergent Wetland	3
Figure 3.18-2: Palustrine Scrub/Shrub Wetland	3
Figure 3.18-3: Palustrine Forested Wetland	3
Figure 3.18-4: Palustrine Unconsolidated Bottom (Open Water).....	4
Figure 3.18-5: Palustrine Unconsolidated Shore	4
Figure 3.18-6: Lacustrine Limnetic Unconsolidated Bottom	4

TABLES

Table 3.18-1: Wetland Impacts.....	5
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3.18 WETLAND IMPACTS

3.18.1 Introduction

The definition of wetland used by the U.S. Army Corps of Engineers (USACE) and the U.S. Environmental Protection Agency (USEPA) since the 1970s for regulatory purposes states, *“Wetlands are areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.”* – There are many other definitions for a wetland; however, all definitions share the following three basic characteristics:

- **Wetland vegetation** – plant community adapted to prolonged inundation or soil saturation
- **Hydric soil** – soil that formed under conditions of saturation, long enough to develop anaerobic conditions
- **Hydrology** – an area that provides indicators or evidence that a site has been inundated with a continuing hydrologic regime for a significant period of time to influence its plant community and soil types

Wetlands support large concentrations of flora and fauna. Even though they constitute only 3.5 percent of Indiana’s land area, they provide connectivity among other aquatic habitats, as well as a transition to upland habitat. Wetlands along riverbanks are very important for bank stabilization, slowing the flow of floodwaters and reducing peak river flows. Wetlands can also serve as recharge areas for underlying aquifers.

3.18.1.1 Mid-States Project Area High Quality Wetland Complexes

There are eight major natural areas with significant wetland complexes located within the Mid-States Study Area. See **Appendix K** for a map and additional information. No alternatives impact any of these areas.

- **Goose Pond Fish and Wildlife Area** - Approximately 7,200 acres in northwest Greene County serve many migratory birds and shorebirds.
- **Glendale Fish and Wildlife Area** – Over 8,000 acres of land in southeast Daviess County provide recreational opportunities and refuge for wildlife.
- **Patoka River National Wildlife Refuge** - Approximately 12,700 acres in southeast Pike County provide unique habitat for nesting birds, endangered species and recreational opportunities.
- **Barnes-Seng (Jasper Marsh) Wetland Conservation Area** – Approximately 180 acres in southwest Dubois County provide habitat for waterfowl and game species.
- **Buffalo Pond Nature Preserve** - Approximately 390 acres in northwest Dubois County provide habitat for a variety of plants and wildlife.
- **Bloomfield Barrens Nature Preserve** - Approximately 803 acres in southwest Spencer County provide habitat for a variety of plants and wildlife.
- **Little Pigeon Creek Wetland Conservation Area** – Approximately 1,039 acres in east Warrick County and west Spencer County provide habitat for a variety of plants and wildlife.
- **Thousand Acre Woods** – Approximately 944 acres in west central Daviess County between North Fork of Prairie Creek and South Fork Prairie Creek provide quality bottomland habitat.

For details about wetland importance, classification and analysis, see **Appendix K – Wetland Impact Analysis**.



3.18.2 Methodology

For this Tier 1 analysis, wetland impacts were estimated using National Wetland Inventory (NWI) data, which are part of the Mid-States Corridor Geographic Information System (GIS). NWI data were used in this analysis because it is the best available source for evaluating potential impacts on a large scale without conducting on-site investigations. It is an appropriate source to compare relative wetland impacts at a Tier 1 level of analysis. NWI mapping uses natural color aerial photos, infrared aerial photos, hydric soil mapping and other information to identify and classify wetlands. The NWI system is based on *Classification of Wetlands and Deepwater Habitats of the United States* (U.S. Fish and Wildlife Service 1979). For the Mid-States Corridor project, wetland impacts were calculated to the following NWI “class” levels. See **Appendix K – Wetland Impact Analysis** for additional explanation of NWI wetland classification.

- **Palustrine Emergent Wetland (PEM)** - Emergent wetlands are characterized by erect, rooted and herbaceous hydrophytes, excluding mosses and lichens. (**Figure 3.18-1**) The vegetation in emergent wetlands is present for most of the growing season in most years (USFWS 1979). Typical plant species of emergent wetlands include cattails, bulrushes and reeds.
- **Palustrine Scrub/Shrub Wetland (PSS)** - Scrub/Shrub wetland areas are dominated by woody vegetation less than six meters (20 feet) tall. (**Figure 3.18-2**) The species include shrubs, young trees and trees or shrubs that are small or stunted because of environmental conditions (USFWS 1979). Typical plant species of scrub/shrub wetlands include willows, buttonbush, rose mallow and spicebush.
- **Palustrine Forested Wetlands (PFO)** - Forested wetlands are wetlands characterized by woody vegetation six meters (20 feet) tall or taller (**Figure 3.18-3**) (USFWS 1979). Forested wetlands normally possess an upper canopy of trees, an understory of young trees and shrubs and an herbaceous ground layer. (USGS, 1998). Typical plant species of forested wetlands include silver maple, sycamore, cottonwood and pin oak.
- **Palustrine Unconsolidated Bottom Wetlands (PUB)** - Unconsolidated bottom wetlands are characterized by areas of water with at least 25 percent cover of particles smaller than stones, less than 6-7cm, and a vegetative cover less than 30 percent (**Figure 3.18-4**) (USFWS 1979). These are generally referred to as ponds.
- **Palustrine Unconsolidated Shore Wetlands (PUS)** – Unconsolidated shore wetlands are characterized by 75 percent areal cover of stones, boulders or bedrock and less than 30 percent areal cover of vegetation (**Figure 3.18-5**) (USFWS 1979).



**Figure 3.18-1: Palustrine
Emergent Wetland**



**Figure 3.18-2: Palustrine
Scrub/Shrub Wetland**



**Figure 3.18-3: Palustrine
Forested Wetland**



Figure 3.18-4: Palustrine Unconsolidated Bottom (Open Water)



Figure 3.18-5: Palustrine Unconsolidated Shore



Figure 3.18-6: Lacustrine Limnetic Unconsolidated Bottom

- **Lacustrine Limnetic Unconsolidated Bottom (L1UB)** – Lacustrine unconsolidated bottom systems are characterized by topographic depressions or a dammed river channel that lack trees, shrubs, persistent emergent fauna, emergent mosses or lichens with greater than 30 percent areal coverage and a total area that exceeds 20 acres. These systems typically are greater than 6.6 feet deep with considerable wave action. (**Figure 3.18-6**) (USFWS 1979)

For each alternative, the impact acreage for each NWI polygon was calculated based on the intersection with the working alignment footprint. Wetland acreage was determined for the five “class” levels noted above but were not further categorized using “subclass” and descriptive “modifiers”. For the Tier 1 analysis, none of the individual NWI polygon wetlands were field checked to confirm they are wetlands, the NWI class is correct or that the mapped boundary is correct. Additionally, it is not uncommon for wetlands to be present on the landscape, but not included in the NWI data set. Therefore, since detailed field studies have not been conducted for the Tier 1 analysis, any such wetlands would not be reflected in this analysis. Finally, not all wetlands are regulated under the Clean Water Act; however, all potential wetlands identified in this analysis are assumed present and regulated for the purposes of impact evaluation. The presence and absence of wetlands, and their regulatory status, will be determined in Tier 2.

3.18.3 Analysis

The total impacts by wetland class for each alternative are provided in **Table 3.18-1**. Acreages are rounded to the nearest whole number. For each alternative, the impact acreages are given as ranges to represent the least anticipated area, typically the Super-2 facility type, and the greatest area, typically the expressway facility type. This range also covers the difference between the Alternative P variations east and west of Loogootee and includes the respective local improvements. Based on the NWI data set analysis, wetland impacts are anticipated for each of the proposed alternatives. Impacts have been minimized where possible during alternative development. Alternative M has the greatest potential for overall wetland impacts with a range of 98 acres to 111 acres. This alignment goes to the east around Huntingburg and Jasper, parallels US 231 to the east up to Loogootee, and then northeast across Martin and Lawrence counties to SR 37 at Bedford. Alternative P has the least potential for overall wetland impacts with a range of 39 acres for the Super-2 variation west Loogootee to 56 acres for the expressway variation east of Loogootee. This alternative also goes to the east around Huntingburg and Jasper and has variations passing either east or west of Loogootee. The greatest difference in wetland impacts between Alternatives M and P is attributable to the impacts beyond where the two alternatives diverge in southern Martin County. Alternative M from Loogootee to Bedford impacts many more wetlands than the Alternative P variations continuing to I-69 at Crane.



Most individual wetland impacts are small in size, less than five acres. However, Alternative B would impact a large palustrine forest wetland in the Ell Creek floodplain in Dubois County southwest of Jasper. Impacts to this wetland alone are greater than 15 acres for the expressway facility type variation and approximately 13 acres for the Super-2 facility type variation. The Alternative B working alignment footprint also impacts 15 acres of a single palustrine forest wetland polygon associated with a Veale Creek tributary in Daviess County, at the location of the Alternative B interchange with I-69.

The palustrine forested wetland is the most commonly impacted class. Between 52 percent, for Alternative M, and 77 percent, for Alternative P, of total wetland impacts are to forested wetlands. Since the working alignment footprint for the expressway facility type is larger than the Super-2 facility type variation, it is presumed that anticipated wetland impacts are similarly greater for all expressway facility types. For Alternative P, the expressway facility type variation east of Loogootee would potentially result in 36 percent more wetland impacts than the Super-2 facility type variation. Conversely, the Alternative B expressway facility type variation would potentially result in only 10 percent more wetland impacts compared to the Super-2 facility type. Wetland acreage is estimated to range from 1.5 percent of the total land within the expressway working alignment for Alternative P to 3.3 percent for Alternative B.

With the exception of Local Improvement 2, anticipated impacts to high quality wetlands associated with the Patoka River and the East Fork White River watersheds have been avoided during alternative alignment development. Local Improvement 2 upgrades to US 231 between Huntingburg and Jasper could potentially involve direct and/or indirect impacts to forested wetland habitat immediately along one or both sides of 0.7 mile of the highway through the Hunley Creek watershed.

Wetland Impacts*								
Alternatives**	Forested Wetland	Scrub/Shrub Wetland	Emergent Wetland	Unconsolidated Shore	Ponds	Lake	Total	Estimated Mitigation (Acres)
Alternative B	54-59	2	9-11	0	11-12	0	76-84	186-204
Alternative C	30-37	3-4	2	0	11-13	0	46-56	110-135
Alternative M	51-60	2-3	12	1	26-31	5	98-111	202-235
Alternative O	32-38	2-3	3-4	0	8-10	0	46-55	113-134
Alternative P	30-41	2-3	1	0	5-10	0	39-56	100-141

* Tier 1 Route Impacts are reported in ranges including all the alternative bypass and facility type options.
 ** The freeway facility type is no longer under consideration. Therefore, no modifications to existing US 231 in Section 1 and existing SR 37 in Section 3 are anticipated. No impacts are anticipated along either of these facilities.

Table 3.18-1: Wetland Impacts

The collective estimated acreage for the respective local improvements for each alternative are included in the total acreage ranges presented in **Table 3.18-1**. Based on this analysis, the respective local improvements are anticipated to add between 12 to 13 acres of wetland impacts to each alternative. There are no anticipated impacts for Local Improvements 4, 5, 8, 9, 10 and 14. With the exception of Local Improvements 2 and 6, the remaining individual local improvements are only expected to result in impacts to less than one acre for each alternative. Wetland impacts for Local Improvement 6 along US 231 between the East Fork White River and Loogootee are estimated at just over one acre (1.4 acre). Conversely, anticipated impacts for Local Improvement 2 along US 231 through the extensive wetland complexes associated with the Patoka River on both sides of the highway between Huntingburg and Jasper are expected to affect as much as 12 acres of wetland habitat along this 3.2 mile stretch of existing highway. Forested wetland habitat ranging from nine to ten acres constitutes the bulk of the anticipated impacts for the alternatives.



Scrub/shrub wetland impacts are estimated at two acres, emergent impacts are estimated at one to two acres and pond impacts are estimated at less than one acre for each alternative. **Appendix K** provides additional details related to the location of these wetland impacts.

3.18.4 Mitigation

Impacts to wetlands are regulated under Section 404 of the Clean Water Act. The USACE is the responsible permitting agency for Section 404 and is required to conduct an alternatives analysis under the guidelines of Section 404(b) (1) prior to issuing a general permit. The guidelines of the analysis mandate the agency evaluate all alternatives equally and select the “Least Environmentally Damaging Practicable Alternative” (LEDPA). Compensatory mitigation actions are required for impacts, but the compensatory actions cannot be considered as part of the LEDPA analysis (*i.e., an alternative which has larger wetland impacts than another cannot provide additional mitigation to offset the difference*). A compensatory mitigation plan for wetlands impacted by the project will be detailed further in Tier 2 NEPA studies and during the Clean Water Act Section 404/401 permitting process. Based upon other past INDOT projects, **Table 3.18-1** also provides estimated wetland impact mitigation quantities for each alternative. These are only estimates. Final mitigation quantities will be established during post-NEPA permitting activities.

3.18.5 Summary

The Mid-States Corridor project is a large undertaking. Aquatic resources such as streams and wetlands are present throughout the project area. It is not possible to avoid wetland impacts. Nevertheless, in this Tier 1 development phase, all efforts were made to position alternative alignments in locations that would avoid or minimize impacts to wetlands to the maximum extent possible, while still adhering to engineering design standards for each facility type.

For the five alternatives evaluated as part of the Mid-States Corridor Tier 1 analysis, Alternative M is expected to result in the greatest potential impact to wetland acreage at 98 to 112 acres. Conversely, Preferred Alternative P would result in the least potential impact to wetlands at 39 to 56 acres (Alternative P is slightly less than the anticipated for 47 to 58 acres of impact associated with Alternative C). For Alternative P, the western variation around Loogootee is expected to incur fewer wetland impacts than the eastern variation. The expressway facility type variation is expected to result in 11 to 22 percent greater wetland impacts than the Super-2 facility type variation for all five alternatives/variations evaluated. For the preferred Alternative P, the expressway facility type variation is expected to have 21 to 22 percent greater wetland impacts than the Super-2 facility type variation.