

ENVIRONMENTAL ASSESSMENT

Rouge River
Section 1135 Ecosystem Restoration
Wayne County, Michigan



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ENVIRONMENTAL ASSESSMENT

Rouge River Section 1135 Ecosystem Restoration Wayne County, Michigan

1.0 SUMMARY

1.1 The U.S. Army Corps of Engineers, Detroit District, proposes to restore some of the natural features and values of the Rouge River at the site of the 1962 Corps Rouge River Flood Control Project. The flood control project effectively handles flood flows but also eliminated all riverine functions and habitat that had historically existed along its reach, and is an impediment to fish migration. This Environmental Assessment addresses proposed ecosystem restoration within a reach of 1.4 miles from Michigan Avenue to Rotunda Drive along the Main Stem of the Rouge River in Dearborn, Michigan.

1.2 Various levels of restoration were considered from simply removing some of the concrete channel lining to total concrete removal. The preferred ecosystem restoration alternative is to remove the concrete channel liner down to the normal water surface elevation, excavate the river banks to create floodplains and off-channel aquatic habitat.

1.3 The increased cross section from excavating floodplains compensates for the loss of the channel smoothness associated with the concrete channel lining, so that the flood carrying capacity of the project is not compromised. The lower part of the concrete “V” channel that comprises the riverbed would remain to help ensure sufficient flow conveyance for prevention of upstream flooding, to help maintain the structural integrity of bridge foundations, and to discourage channel erosion.

2.0 INTRODUCTION¹

2.1 The Rouge River (Main Stem) and its principal tributaries (Upper Rouge Branch, Middle Rouge Branch and Lower Rouge Branch), originate in a moderately rolling belt of hills to the northwest and west of the project area. This elevated terrain occupies about 30% of the Rouge drainage basin; the remainder of the basin is a flat plain that is the former bed of a glacial lake. The upland and lowland reaches are well defined by a ridge that was the beach of the glacial lake. The ground surface descends 167 feet in elevation as the river flows southeastward from the beach ridge to the Detroit River. This area is composed of clays and sands normally associated with lakebeds.

1. This discussion and other sections of this assessment draw upon information from the Rouge River Assessment by Jennifer D. Beam and Jeffrey J. Braunscheidel. 1998. Michigan Department of Natural Resources, Fisheries Division, Special Report 22. Ann Arbor, Michigan.

2.2 The drainage basin of the Rouge River is within the counties of Wayne, Oakland, and Washtenaw in southeast Michigan and includes 48 municipalities (Figure 1). The fan shaped basin of the Rouge drains a 464 square mile region, which is home to 1.5 million people and much of the Greater Detroit area. More than 50 miles of riverbank borders public parkland, making the Rouge River one of the most accessible rivers in the state.

2.3 The once ecologically vibrant Rouge River was surrounded with thick hardwood forests and wetlands. In the late 1700s land was being cleared for farming. The area population grew rapidly in the 1800s. Towns, mills, and farms were established throughout the Rouge River drainage basin. In the early 1900s the construction of the Ford Motor Company, Rouge Manufacturing Complex, near the mouth of the Rouge River attracted many people and substantial additional development to the Rouge River Watershed. Today, over 50% of the entire watershed is classified as urban and less than 25% remains undeveloped. This urbanization increased the volume and rate of runoff to the river system; water quality was degraded because of increased sedimentation and pollution levels as a result of development.

The Flood Control Project

2.4 The proposed ecosystem restoration project is within the limits of the 1962 Rouge River Flood Control Project (a Federal project completed in 1978). In the 1960's and 1970's, a section of the Rouge River, from Michigan Avenue to the upstream limit of the Federal navigation project,² was channelized with a concrete liner by the Corps of Engineers (Figure 2). This project provided needed flood reduction for southwest Detroit, and the cities of Dearborn, Allen Park, and Melvindale, in Wayne County, Michigan. The flood control project reduced the length of this portion of the river from 5.8 miles of natural river to 4.2 miles of concrete-lined channel by straightening and realigning (Figures 3 and 4).

2.5 Channelization of the Main Stem of the Rouge River in 1978 significantly increased the efficiency of floodwater conveyance toward the Detroit River. The channelization also eliminated all large-river habitats through its course and disconnected that area from public access. Meanders, riffles, pools and floodplain were eliminated in favor of a nearly straight, smooth and wide concrete channel. Upper banks were graded and grass seed planted. Much of the nearby open field and marshy areas near the river were covered with fill from the excavation of the channel modification.

2.6 The concrete channel inhibits fish migrations upstream from the Great Lakes/Detroit River because of high spring flows (which, because of a lack of resting areas in the channel, prevents passage of some fish species), and through degraded water quality during the lower velocity summer months, which can hinder fish passage because of low dissolved oxygen levels.

2. The Federal navigation project includes a turning basin at its upstream limit and extends downstream about 3 miles to the Detroit River.

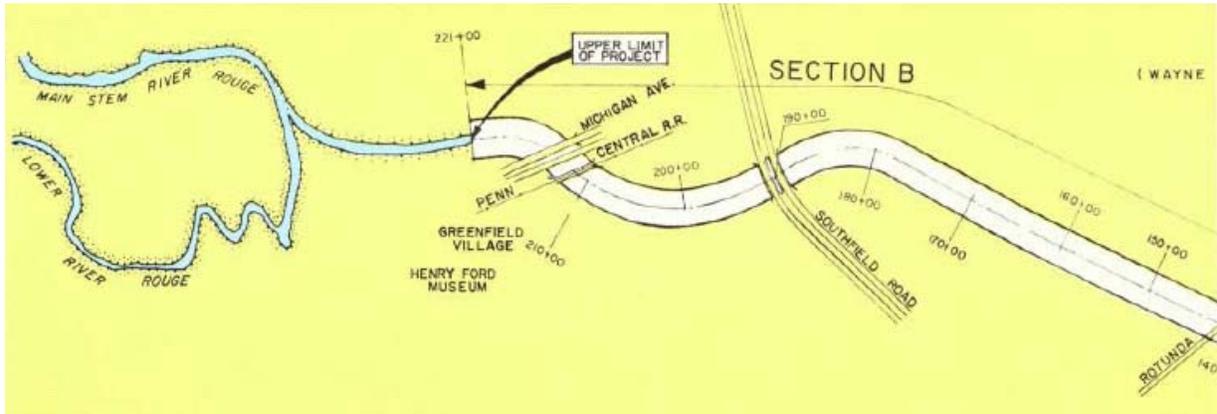


Figure 2a. The 1962 Flood Control Project, Section B (upstream section and subject area of current Section 1135 study).

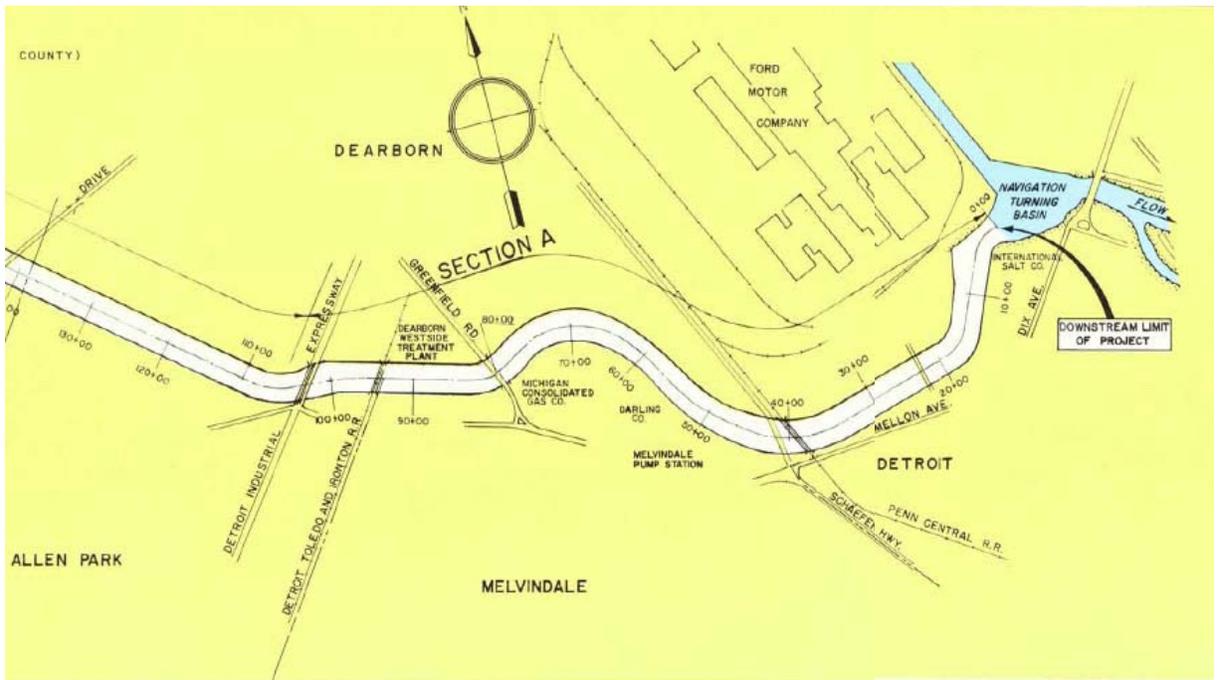


Figure 2b. The 1962 Flood Control Project, Section A (downstream section).

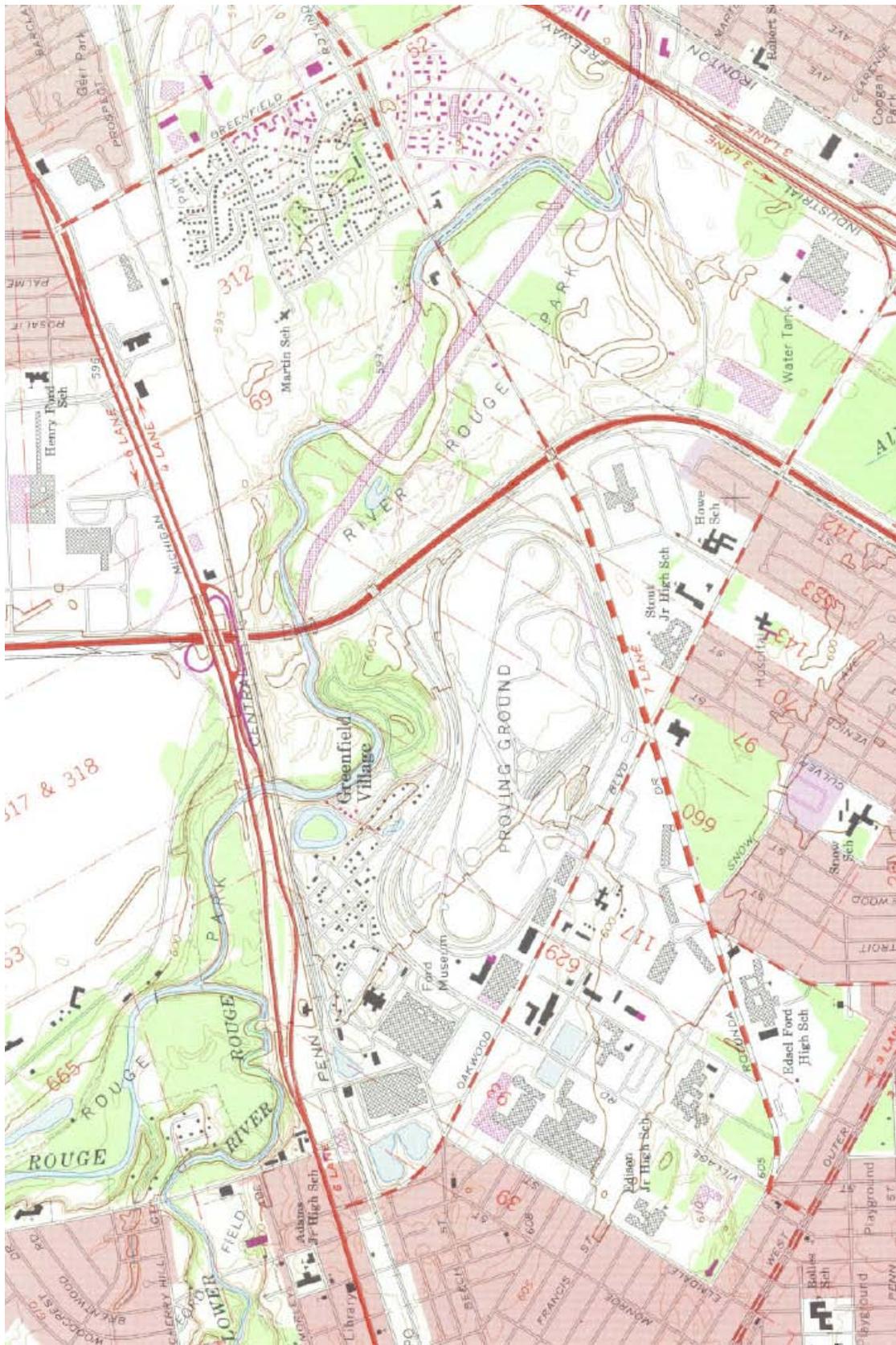


Figure 3. U.S.G.S Topographic Map of Proposed Ecosystem Restoration Project Area Showing Original River Channel Alignment and some of the Modifications along the upper half of the 1962 Flood Control Project.

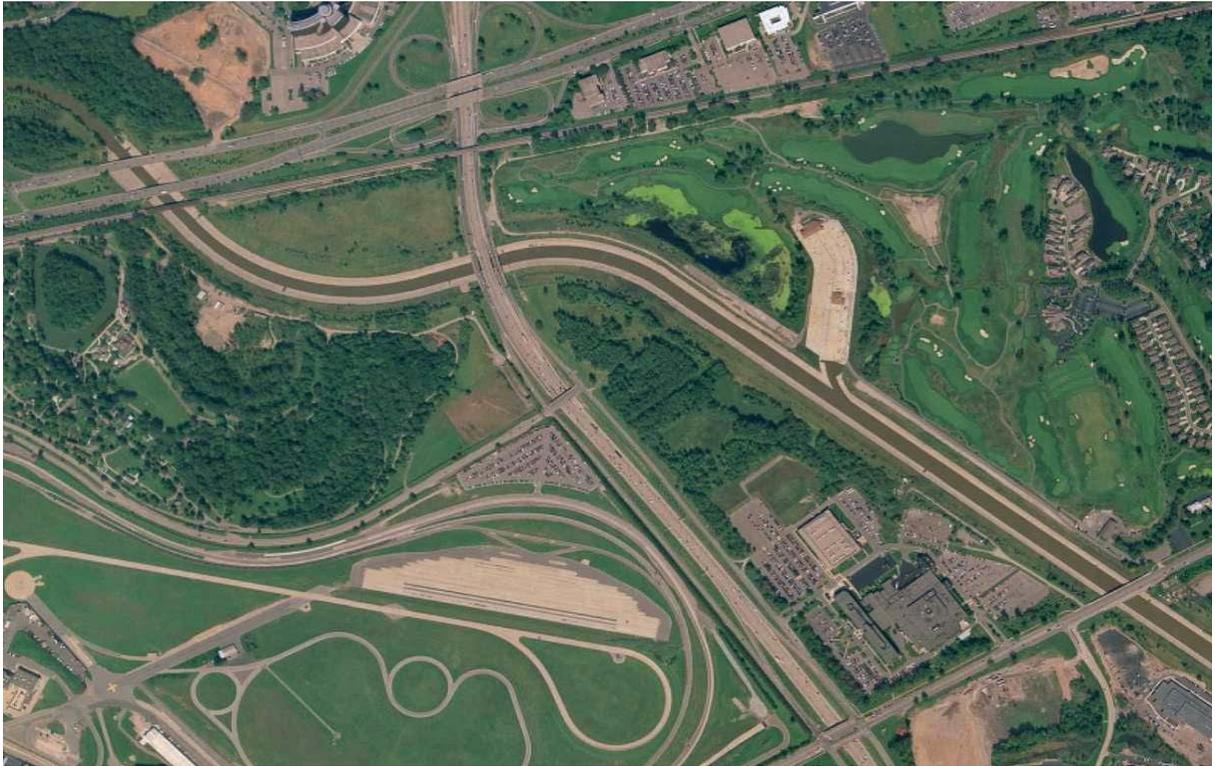


Figure 4. Rouge Ecosystem Restoration Project Area, showing from Michigan Avenue (upper left) to Rotunda Drive (lower right). Note the large CSO retention basin (the Hubbell-Southfield CSO) entering river from north within the golf course.

Rouge River Gateway Master Plan

2.7 The Gateway Master Plan, developed by regional stakeholders, is an interconnected set of improvements and restorations designed to rehabilitate and improve the Rouge River corridor along the Main Stem of the Rouge River, or approximately the lower eight miles of river from the mouth to about 1 mile upstream of the confluence with the Lower Branch Rouge River.³ Multiple enhancements are planned, based on the “re-naturalization” of this Main Stem, which include creation of various educational and historic interpretive areas, tour-based docking facilities, trails and river-related attraction. The plan includes various projects intended to restore relationships between the Rouge and its natural and social systems, such as the recent restoration of an oxbow at Greenfield Village (discussed below) and a proposal for fish passage around the Henry Ford Estate (Fairlane) Dam.

³ Rouge River Gateway Project: Restoration of an Urban River. Kelly A. Cave, James E. Murray, Edward J. Bagale, Sam B. Lovall, Nancy J. Andrews, Carl R. Johnson. Paper, February 2002, 25 pages.

The Oxbow Restoration

2.8 In 2002 a former river meander was restored at what is called the Rouge Oxbow, located between Michigan Avenue and the Southfield Freeway (M-39) on the south side of the flood control channel (Figure 5). On the topographic map (Figure 3) the Oxbow is shown as a meander where the words “Greenfield Village” are printed in the middle of the map. This meander was cut off and filled when the channel was straightened for flood control (the actual flood control channel alignment at the Oxbow is not shown on the topographic map).



Figure 5. Rouge Oxbow Restoration Project Area (Oxbow is immediately east of the D-shaped Suwanee Lagoon and Island, a tourist feature of Greenfield Village).

2.9 A large City of Dearborn CSO crosses the Oxbow, discharging into the Rouge about 70 feet upstream from the new Oxbow opening. Oxbow water passes under this CSO pipe through a 36-inch diameter siphon conduit. This may be removed and the CSO discharge restored to the Oxbow in a future phase of the Oxbow Restoration.

2.10 The Oxbow restoration project removed the fill and made connections to the Rouge River at either end of the Oxbow through culverts. This restoration includes a 2,200-foot-long channel, varying from 15 to 105 feet wide and ranging approximately 3 to 8 feet deep. The channel is surrounded by several acres of submergent and emergent wetlands, transitioning to 10 acres of existing and restored upland woodland and meadow (Figure 6). A variety of small mammals, waterfowl, reptiles, amphibians, fish, and macro-invertebrates have taken up residence in the Oxbow. In 2006 the downstream end of the Oxbow was reconstructed to create a natural opening to the Rouge River.



Figure 6. The Rouge River Oxbow Restoration (photographed summer 2010).

Hubbell-Southfield CSO

2.11 The Hubbell-Southfield CSO retention basin, constructed in the 1990s, discharges into the project reach about midway between Southfield Freeway and Rotunda Drive (Figure 4). This CSO retention basin has a 22-million-gallon storage capacity, which allows water to be retained in a controlled manner to lessen the peak flows and to allow treatment and settling of urban-runoff before it is released to the Rouge River.

3.0 PURPOSE AND NEED OF PROPOSED ACTION

3.1 The purpose of the proposed Sec. 1135 ecosystem restoration project at the Rouge River is to restore a degree of ecological function, connectivity and aesthetics along this channelized reach of the Rouge River. This is needed because the existing channel is lacking in natural habitat (terrestrial and aquatic) and presents an impediment to fish passage. The vegetation present on the upper banks above the concrete channel liner is mostly weedy, non-native and invasive species. The existing river channel is smooth concrete to expedite floodwaters, which is the opposite of the channel roughness needed to support diverse biological communities.

3.2 The proposed Sec. 1135 project would provide improved fish passage to the Rouge Oxbow, the natural river between Michigan Avenue and the Henry Ford Estate Dam, and 10.5 miles of the Lower Branch Rouge River up to the first dam. Proposed ecosystem improvements are limited by the need to avoid inducing significant backwater effects that could result in flooding of upstream areas during storm events.

3.3 Because of the need to maintain floodwater conveyance, structures would not be added to the main river channel, but would be provided through off-channel aquatic habitat with natural diversity that will enable fish to rest, hunt, and reproduce along the concrete channel in the project reach, and will assist fish in passing through the concrete channel section of the river. The Section 1135 project would also provide improve habitat along the river corridor through the restoration of floodplain areas with natural vegetation communities on a shallower slope than is currently present along the concrete channel.

4.0 PROJECT AUTHORITY

Original Flood Control Project

4.1 The original Rouge River Flood Control project was authorized by the Flood Control Act of 1962 (Public Law 97-874). The authorization provided for the enlargement, straightening, alteration and/or replacement of the existing river bridges and the deepening, widening, straightening and paving of the existing Rouge River channel for a distance of approximately 4 miles. Also included in this project was the construction of a new railroad bridge and alteration of two other railroad bridges at Federal expense, and the construction or alteration of highway bridges at 100% local expense. Actual work on the project began in October 1962 and was officially completed in 1978. The total cost of construction was \$31,960,332.

Section 1135 Ecosystem Restoration Study

4.2 This ecosystem restoration study is being conducted under the Section 1135 authority, Environmental Protection and Restoration, Project Modification for Improvement of the Environment, of the 1986 Water Resources Development Act (PL 99-662), which states that “the Secretary [of the Army] is authorized to review the operation of water resources projects constructed by the Secretary before the date of enactment of this Act to determine the need for modifications in structures and the operations of such project for the purpose of improving the quality of the environment in the public interest.”

5.0 ALTERNATIVES

5.1 This ecosystem restoration study focuses on 1.4 miles of river channel beginning at the upstream limit of the flood control project just north of Michigan Avenue and extending downstream to Rotunda Drive (Figure 2a). Funding limitations constrain the study area to less than the total concrete flood control project reach. Therefore the study reach is located at the upstream end of the concrete channel for continuity with the existing habitat of the Rouge Oxbow, the natural river between Michigan Avenue and the Henry Ford Estate Dam, and 10.5

miles of the Lower Branch Rouge River up to the first dam. Based on the results of this Section 1135 project, future projects could be sought to extend habitat features farther downstream.

5.2 The project area is constrained by development that has occurred since the original flood control project was constructed, which prevents a full restoration of the river with meanders and natural channel. All work will be within the flood control project right-of-ways which extend 125 feet out from the center of the concrete channel on either side for a total width of 450 feet (Figure 7). Since a total restoration is not possible, alternatives considered include various measures to partially restore habitat features to the river within the study reach.

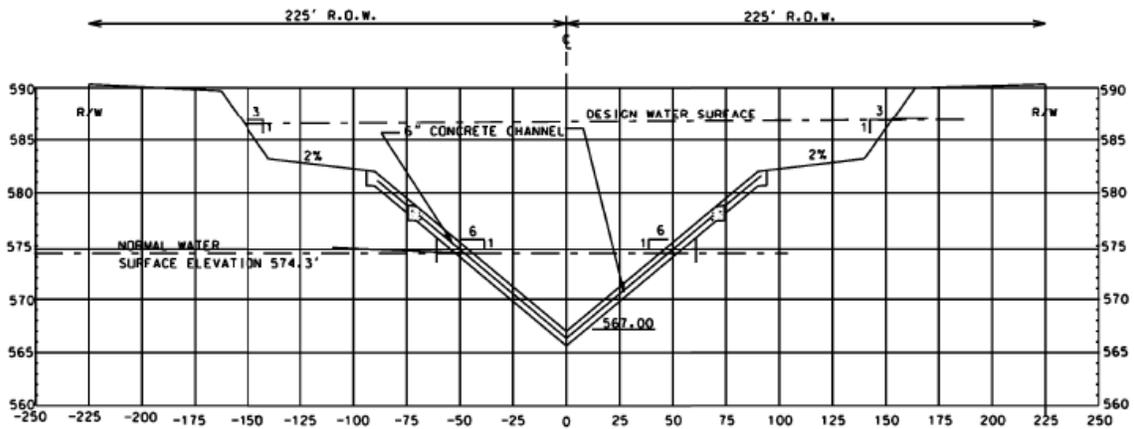


Figure 7. Typical Existing Channel Cross Section for Existing Project. (Note horizontal and vertical are different scales).

5.3 Features considered for restoration of habitat to the Section 1135 study reach included total concrete removal to restore a natural river channel, partial concrete removal to excavate floodplains alongside the concrete channel, placement of submerged structures within the concrete channel (in-stream structure), and construction of off-channel aquatic habitat (side-stream wetlands).

5.4 Total concrete removal and development of a natural channel bottom is not feasible because the increased channel roughness from removing the concrete would result in increased flood stages upstream. This is not acceptable because any increase in the 100-year flood elevations outside the Sec. 1135 project area is not allowed under Section 1135 policy, or by State floodplain regulations. Additionally, it would be difficult to prevent a natural channel from eroding the banks, which potentially could undermine adjacent properties. Therefore, total concrete removal is not further considered under this study.

5.5 Partial concrete removal and excavation of floodplains is a feasible option because bank excavation to create floodplains compensates for the loss of channel smoothness (due to the partial concrete removal) by increasing the cross sectional area for flood flow conveyance (Figure 8). The floodplains would provide habitat along the river channel and the remaining concrete would prevent meandering of the river channel and associated erosion, which could

undermine adjacent properties. Therefore, partial concrete removal and excavation of floodplain becomes a core feature of all the action alternatives.

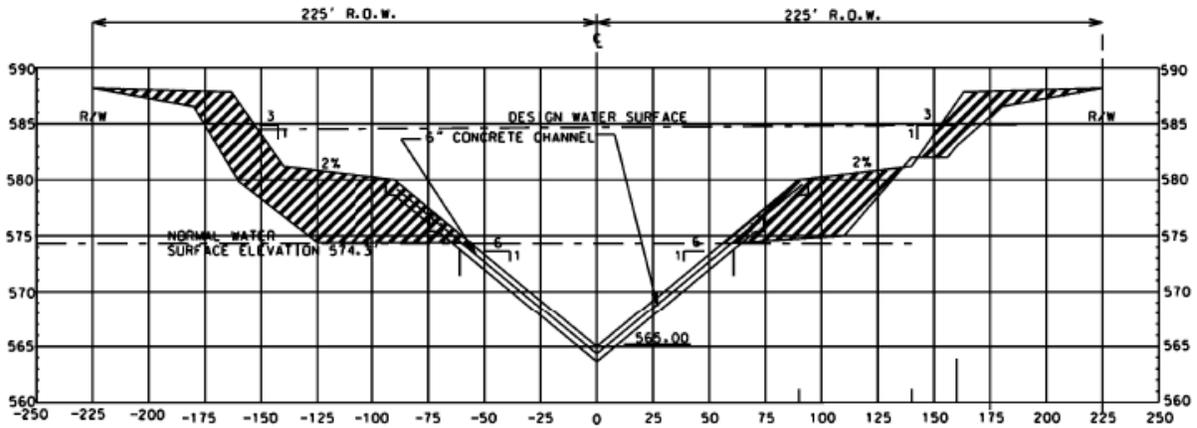


Figure 8. Partial Concrete Removal and Construction of Floodplains.

5.6 Placement of in-stream structure such as submerged stones, small concrete barriers, etc., within the concrete river channel would help fish passage upstream by providing small underwater eddy areas that fish can use for temporary refuge from high flow velocities that occur in the spring. These submerged structures would not, however, produce riffles and aeration because of the extremely low gradient of the river. This alternative was dropped from further consideration because hydraulic modeling showed it would increase flood stages up to 1 mile upstream from the project reach.

5.7 Construction of off-channel aquatic habitat (Side-Stream Wetlands) would enhance the habitat associated with the floodplain and would have negligible effect on flood flows because they would be below the grade of the floodplain (Figure 9). Constructed side-stream wetlands would include large off-channel open water pools to provide aquatic habitat and an area for fish to rest as they are moving upstream.

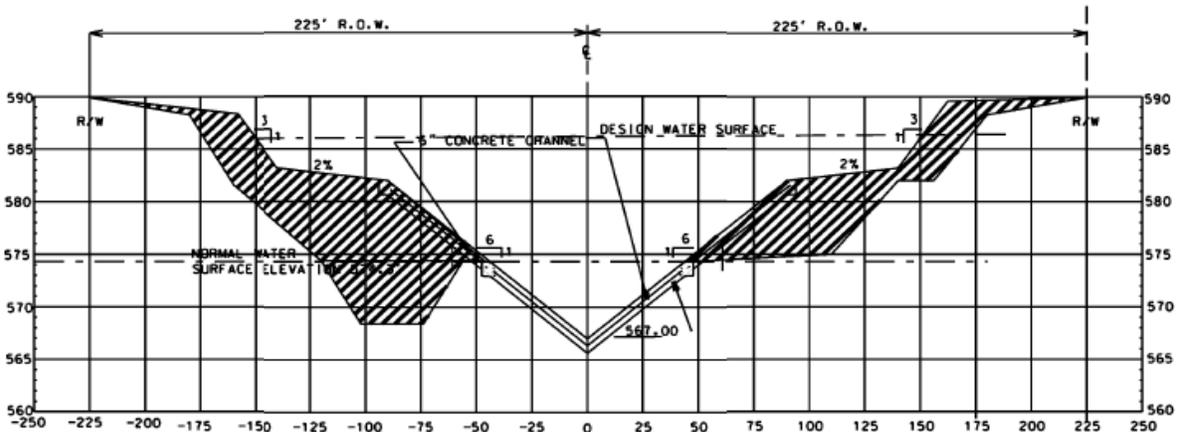


Figure 9. Cross Section Showing Bank Excavation and Side-Stream Wetland in North Bank.

5.8 The feasible features listed above, partial concrete removal with excavation of floodplains and construction of off-channel aquatic habitat (Side-Stream Wetlands), were combined into several alternatives in cooperation with the County. The alternatives for the Section 1135 study are listed in Table 1, along with excavation quantities, and are discussed below.

Table 1. Alternative	Concrete Removal (Cubic Yards)	Bank Excavation (Cubic Yards)
1. No Federal Action	Not applicable	Not applicable
2. Remove Concrete & Construct a Side-Stream Wetland Downstream (East) of the Southfield Freeway Overpass	10,603	221,421
3. Remove Concrete & Construct a Side-Stream Wetland Upstream (West) of Southfield Freeway	10,603	207,643
4. Removal Concrete Only – No Side-Stream Wetlands	10,603	202,532
5. Remove Concrete & Construct Two Side-Stream Wetlands Upstream (West) & Downstream (East) of Southfield Freeway *	5,290	113,279
6. Remove Concrete & Construct Two Side-Stream Wetlands Next to the Southfield CSO	10,132**	243,083
Notes: * Alternative 5 affects only the east riverbank; the west bank would remain in current condition. ** Concrete removal quantity of Alternative 6 differs from that of Alternatives 2, 3, & 4 because Alternative 6 is shifted downstream and encounters different hard structures along the banks.		

No Federal Action (Alternative 1)

5.9 Under Alternative 1, No Federal Action, the Corps would leave the original flood control project unaltered as shown in the existing channel cross section (Figure 7). The concrete banks would remain in place and no riparian restoration would be initiated. If the Corps does not continue with this Section 1135 project, the County or any of the other stakeholders would not have the authority to alter the current flood control project. Thus, unless a stakeholder obtains Federal authorization to modify the project, none of the functions and values of the river system would be restored in the channelized reach.

5.10 Under Alternative 1 much of the current condition would perpetuate except for needed repairs and local sponsor provided operations and maintenance. The river along the 1.4-mile study reach would remain inaccessible to people in the surrounding communities and would continue to be viewed as an open storm drain. The previously restored Oxbow area near the upstream end would still provide good habitat, but the synergistic ecosystem benefits of improved connectivity to the Detroit River/Great Lakes aquatic ecosystem would not occur.

Concrete Removal Only (Alternative 4)

5.11 Alternative 4, Removal Concrete (no side-stream wetlands), includes removing all the concrete lining from the top of the channel down to the normal surface water elevation (NWSE), which is 574.3 feet (National Geodetic Vertical Datum 29), starting from the concrete apron, just north of Michigan Avenue, and ending slightly upstream of the Southfield CSO (Figure 10). The concrete lining above NWSE will be removed on both sides of the channel and the V-shaped bottom will remain in place. Further excavation of the barren banks (ranging from 50 to 150 feet landward of the right of way) to the normal surface water elevation will be completed to produce a gently sloping transitional area to accommodate higher flows.

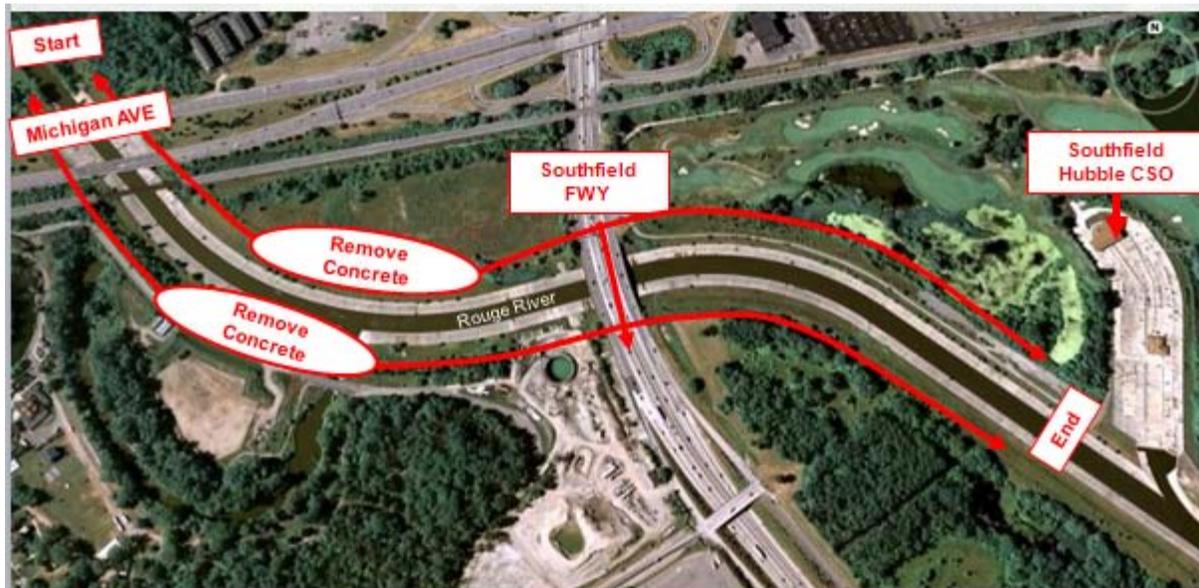


Figure 10. Alternative 4 (Concrete Removal Only) General Layout (0.8-mile total length).

5.12 No concrete would be removed in the vicinities of the various roadway bridges crossing the project reaches. The concrete that comprises the riverbed would remain to discourage channel erosion, which could threaten the bridge footings and adjacent properties, and to provide a smooth trough for main-channel floodwater conveyance.

5.13 The newly excavated floodplains would consist of a gently sloping wet to moist (mesic) meadow above the mean water surface that would mimic similar floodplain terrace elevations in natural areas of the Rouge River of the project location, providing more diverse and higher quality of habitat for a variety of terrestrial mammal, insect and bird species that require a natural land/water transitional zone. The restored floodplain area would be planted with native riparian vegetation, such as grasses, forbs, sedges and shrubs that would yield to flood flows.

5.14 The new floodplain would be susceptible to flooding on an annual basis with water levels at mean water surface elevation. The lower reaches of the Rouge River are highly influenced by lake levels in the Great Lakes. As such, during times of high lake levels, this “floodplain” may be continually submerged for one or more years at a time. Conversely, during periods of low lake levels, this “floodplain” may become drier, possibly not even flooding in a given year.

These fluctuations would occur naturally and over time, which would allow for natural vegetative adjustments as the site becomes wetter or drier as the case may be.

Concrete Removal and Side-Stream Wetlands (Alternatives 2, 3, 5, and 6)

5.15 Alternatives 2, 3, 5 and 6 all include side-stream wetlands in addition to the concrete removal and excavation of floodplains described above. The exception is Alternative 5 where only the north riverbank has concrete removed and a floodplain excavation, leaving the south riverbank in the No Action Alternative condition (unmodified from the original flood control project). Although the study reach is 1.4 miles, each alternative addresses a length of 0.8 mile (4200 feet) within the overall study reach. The side-stream wetland locations are described for each alternative below, followed by more details on the side-stream wetland composition. For information on concrete removal and excavating the floodplain areas, refer to the discussion of Alternative 4 above.

5.16 Alternative 2, Remove Concrete & Construct a Side-Stream Wetland Downstream (East) of the Southfield Freeway Overpass: This alternative includes one side-stream wetland, approximately 1800 feet in length, downstream (east) of the Southfield Freeway (Figure 11).

5.17 Alternative 3, Remove Concrete & Construct a Side-Stream Wetland Upstream (West) of Southfield Freeway: This alternative includes one side-stream wetland, approximately 800 feet in length, located upstream (west) of the Southfield Freeway (Figure 12). Note: Hydraulic modeling showed that this alternative would result in unacceptable increases in flood stages upstream of the project limits; therefore, this alternative is not being further pursued.



Figure 11. Alternative 2 General Layout (0.8-mile total length).



Figure 12. Alternative 3 General Layout (0.8-mile total length).

5.18 Alternative 5, Remove Concrete & Construct Two Side-Stream Wetlands Upstream (West) & Downstream (East) of Southfield Freeway: This alternative includes two side-stream wetlands, one approximately 800 feet in length, located upstream (west) of the Southfield Freeway, and one approximately 1,800 feet in length, located downstream (east) of the Southfield Freeway (Figure 13). Note: Concrete removal and floodplain excavation occur only on the north bank with this alternative. Hydraulic modeling showed that this alternative would result in unacceptable increases in flood stages upstream of the project limits; therefore, this alternative is not being further pursued.



Figure 13. Alternative 5 General Layout (0.8-mile total length).

5.19 Alternative 6, Remove Concrete & Construct Two Side-Stream Wetlands Next to the Southfield CSO: This alternative includes two side-stream wetlands, each approximately 1,800 feet in length, located downstream (east) of the Southfield Freeway on either side of the Southfield CSO (Figure 14).

Description of Side-Stream Wetlands

5.20 For Alternatives 2 and 6, side-stream wetlands would be constructed only on the north side of the river. The side-stream wetlands would be approximately 1,800 feet long with a 30 to 100 foot wide opening to the river about midway along the length of each side-stream wetland and culverts at either end to promote flow. A conceptual drawing of a side-stream wetland is included in Figure 15. A concept design profile (Figure 16) shows the locations of different wetland vegetation types. Note that because of the narrow width and side slopes, the open water/submergent vegetation area works out to approximately 1 acre out of a total 3 acres for the sidestream wetland (total 1800' by 75'). The scrub/shrub and emergent types are generally occurring around the perimeter (approximately 150 feet at either end and 25+ feet around the perimeter) and would overlap considerably depending on water level fluctuation and over time.

5.21 The side-stream wetlands would vary in width, but would average about 75 feet in width. Depth would vary, becoming shallower at the ends to support some emergent aquatic plants, but of sufficient depth in the middle to maintain a large area of open water in conjunction with the main opening to the river. Rocks, basking logs, and emergent and wet meadow plants would be placed within the shallower areas at the ends these wetlands and along the edges, with the rest of the side-stream wetland open water. Anchored logs in the open water areas would provide additional in-water habitat.



Figure 14. Alternative 6 General Layout (0.8-mile total length).

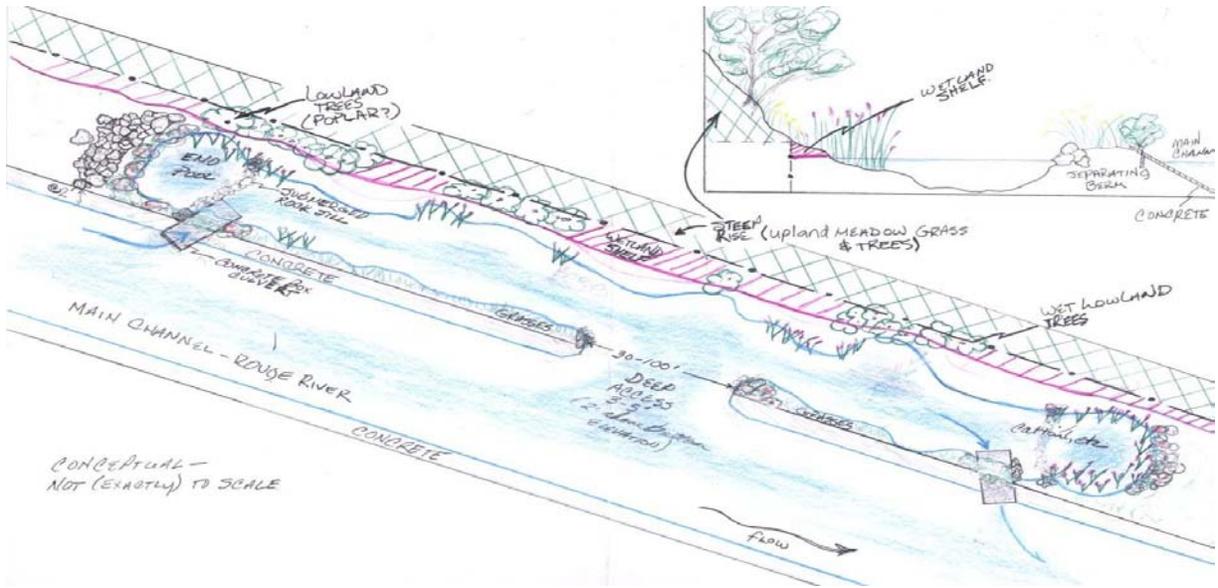
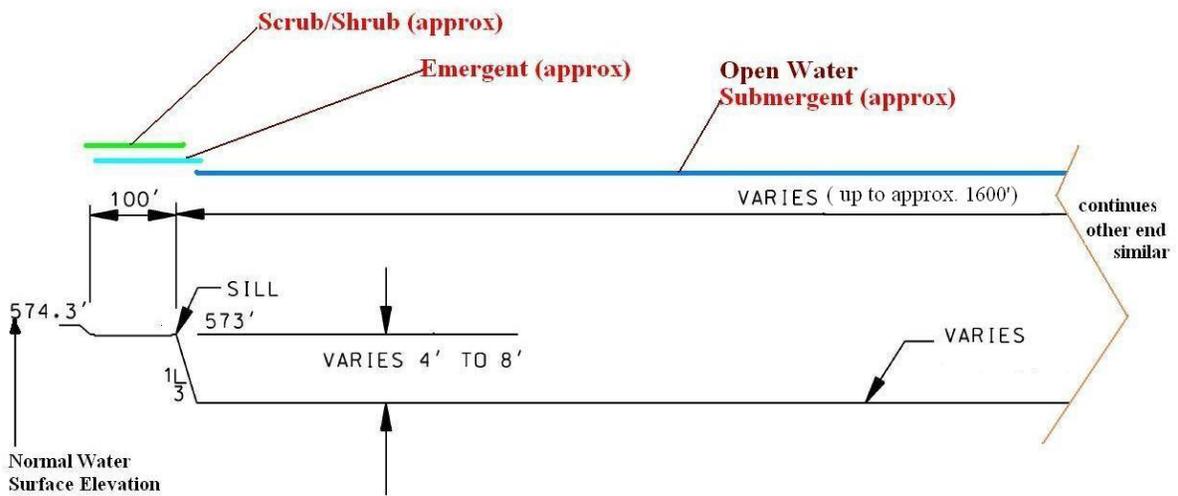


Figure 15. Concept Drawing of Side-stream Wetlands (Not to Scale).



Concept Profile (lengthwise section) of side-stream wetland showing general vegetation types expected.

Figure 16. Concept profile of Side-Stream Wetland.

5.22 Large rectangular culverts (several feet wide) at the upstream and downstream ends of each side-stream wetland would allow river flow and additional fish passage into and out of the side-stream wetlands, depending on water surface elevations. The culvert at the upstream end would be at a higher elevation to minimize the amount of sediment that is carried into the side-stream wetlands, and so at times may be above the water surface. The culvert at the downstream end would be placed lower, since it is not in a position that would allow sedimentation into the side-stream wetlands. The large central opening to the side-stream wetlands would have a depth sufficient that under low water conditions there would be a design minimum water depth of 2 feet to ensure that at all times fish would be able to enter and exit the side-stream wetlands.

5.23 Actual water surface area of the side-stream wetlands will vary with seasonal water level fluctuations. The floodplains would flood only during the largest storm events and would be flooded only for a few days per event. Such flooding would not be expected on an annual basis.

6.0 ALTERNATIVE SELECTION AND THE PROPOSED ACTION

6.1 The selected plan is the National Ecosystem Restoration (NER) plan, which is defined as the plan that reasonably maximizes environmental restoration benefits compared to costs and meets the project goals.. Both cost effectiveness and incremental cost analysis are used to identify the NER plan.

Incremental Costs

6.2 The incremental costs presented in Table 2 are for the added features above and beyond that presented in the previous alternative as listed. The incremental cost per HU of Alternative 4, the basic alternative of concrete removal and excavation of floodplains, is part of all the action alternatives. Moving down the table each alternative's incremental cost is for the added features and/or habitat above and beyond that of the previous alternative. Therefore, Alternative 4's incremental cost is for the addition of an 1800-foot wetland to the basic concrete removal and floodplain excavation of Alternative 4. The incremental cost of Alternative 6 is for the addition of a second side-stream wetland. The alternative selection process uses incremental cost analysis to help find the plan that is most efficient at producing environmental outputs. For the Rouge Section 1135 project, that plan is Alternative 6.

	Table 2. Habitat Features of Each Feasible Alternative	Habitat Units (HU)	Incremental Cost/ HU
1. No Federal Action	None	156	NA
4. Concrete Removal Only— No Side-stream Wetlands	Concrete Removal and Floodplains	521	\$14,619
2. Concrete Removal & Side-stream Wetland Downstream (East) of Southfield Freeway	Concrete Removal and Floodplains Combined With One 1800-foot wetland downstream from Oxbow. (extension of fish habitat ~2000 feet downstream)	597	\$5842
6. Concrete Removal & Two Side-Stream Wetlands Next to the Southfield CSO	Concrete Removal and Floodplains Combined With Two 1800-foot wetlands downstream from Oxbow. (extension of fish habitat ~4700 feet downstream)	733	\$3947

* Notes: The alternatives are listed in this table in order of increasing habitat features. Costs are in terms of 2010 dollars.

Habitat Units

6.3 Habitat benefits were evaluated using a working draft process that was developed within the Corps to produce a standardized output of Habitat Units for both terrestrial and aquatic habitats. The procedure used the Wetland Rapid Assessment Procedure (WRAP), developed by the South Florida Water Management District, as a reference when establishing the criteria used for assessing ecosystem benefits. A full discussion of the methodology for developing Habitat Units for this project is included as an attachment to the main planning report. The following is a brief summary.

6.4 Expected habitat improvements were analyzed for the three feasible action alternatives (Alternatives 2, 4, and 6). The analysis was also applied to the No Action alternative to form a baseline for evaluating habitat improvements. The Rouge River project reach was divided into four zones for this habitat assessment: Concrete River Channel, Floodplain, Side-Stream Wetland, and Upland. Under the no action baseline condition, there are only two zones: Concrete River Channel and Upland. The division between these two zones was set as the elevation of the upper edge of the existing concrete channel lining, or approximately 582 feet. The Floodplain zone is created by removing the upper portion of the concrete channel lining

(above the normal water surface elevation) and excavating the banks. In the action alternatives, the same elevation (582 feet) is used to divide between upland and floodplain. Alternatives 2, 3, and 6 also include excavation of “side-stream wetlands” into the newly cut riverbank

6.5 Development of the Habitat units involved rating each habitat type for each alternative for quality and importance. Quality was rated a scale of 1-10 and Importance on a scale of 1-5. The Habitat Units for each habitat type is the product of Area (in acres), Quality and Importance. Summing the Habitat Units for each habitat type results in the total Habitat Units for each alternative as presented in Table 2. Factors considered in rating Quality included type and structure (diversity, juxtaposition, etc.) of terrestrial and aquatic vegetation. Factors considered in rating Importance include: connectivity, interspersion, and extension of habitats in the project vicinity/region, water quality, and significance (local, regional, State or Federal) of habitat types.

6.6 Concrete River Channel Zone: The river channel remains concrete lined channel under all the alternatives because the concrete removal is only down to the normal water surface elevation for the creation of floodplain habitat. Therefore, no quality improvement occurs for the Concrete River Channel; however, Importance, because it considers the quality of adjacent habitat, increases with the addition of Floodplain and Side-stream Wetlands.

6.7 Floodplain Zone: The Floodplain Zone does not exist in Alternative 1 because the riverbanks are too high. Excavation of both riverbanks in Alternatives 2, 4, and 6 creates a narrow floodplain within the Zone of the one-year flood and provides some habitat quality. Addition of side-stream wetlands in Alternatives 2 and 6 add habitat diversity to the floodplain area. This results in increased quality and importance as habitat features increase through Alternatives 4, 2, and 6 in that order as described in Table 2.

6.8 Side-Stream Wetlands: Side-stream wetlands are not present in Alternative 1 (No Action), or Alternative 4 (Concrete Removal Only), but occur in Alternatives 2 and 6 in increasing number as described in Table 2. This results in an increase in Habitat Units through the alternatives as listed in the table. The Side-stream Wetlands are also the highest quality habitat type in the restoration because they allow for more structure and diversity, and include connections to the Concrete River Channel for fish access.

6.9 Upland Zone: The Upland Zone habitat under Alternative 1, No Action, is non-native vegetation and turf grass, which currently are of very low quality, but do provide minimal function for certain bird and insect species. With Alternatives 2, 4 and 6, the Upland Zone is converted to native trees and shrubs and the density of vegetation is increased. Part of the upland zone, however, is the upper side slopes of the excavated floodplain area and lacks structure because of the need to pass flood flows.

6.10 Alternative 1, No Federal Action, provides an estimated 156 habitat units. This is mainly attributable to the presence of some habitat, mainly upland, at the upper bank areas of the existing project in conjunction with the presence of the river in its highly modified state.

6.11 Alternative 4, Concrete Removal Only—No Side-stream Wetlands, provides an estimated 521 habitat units largely through the creation of approximately 11.6 acres of floodplain along both sides of the river. Also, the Transition Zone is improved substantially by the removal of concrete, and the Upland Zone is improved by diverse upland plantings.

6.12 Alternatives 2 and 6, in that order, add off channel aquatic habitat in the form of Side-stream Wetlands in increasing amounts and distances downstream. Alternative 6 has the highest total Habitat Units because it includes two large side-stream wetlands and provides the greatest extension of habitat downstream.

7.0 CONSTRUCTION OF THE PROPOSED ALTERNATIVE

7.1 The proposed action is Alternative 6, Remove Concrete & Construct a Side-Stream Wetlands Next to the Hubbell Southfield CSO. Construction includes removal of the existing concrete channel liner down to the normal water surface elevation, excavation of the river banks to create a floodplain area, and excavation of side-stream wetland areas. Concrete would not be removed within 50 feet of the existing roadway and railway bridges, because such removal could affect the structural stability of the bridges. Grading would be required to create appropriate slopes.

7.2 Access to the project site would be thru public roads, specifically from Rotunda Drive or from entrance road to Greenfield Village along the Southfield Freeway, both of which allow direct access to the project sites. Once on the project site, there are designated access routes that the County uses for inspection and maintenance of the original Flood Control Project.

7.3 Construction likely would be land based; however, water-based construction is an option for the contractor. Construction activities would be within the project easements of the Federal flood control project, which are the rights-of-way, owned by Wayne County, including storage and staging areas for materials and equipment and are expected to be completed within a single construction season.

7.4 All work, land based or in-water, will be conducted with appropriate erosion and/or turbidity controls to prevent sedimentation into the river and to minimize turbidity effects from constructing the side-stream wetland openings and culverts. This may entail the use of cofferdams around the side-stream wetland openings during construction. Work would likely be sequenced to limit the total amount of exposed soils at any one time.

7.5 Clean fill materials (such as rocks, logs, etc) would be placed in side-stream wetlands for habitat variety and structure. Native vegetation would be planted in accordance with the habitat areas and to the types and densities allowable based on hydraulic modeling to prevent significant flood flow restrictions. Plantings would likely be similar to those used in the Oxbow Restoration (see plant lists, Attachment 1).

Disposal of Excavated Materials

7.6 On site materials would be used to the extent they are physically and environmentally suitable for a construction base, supplemented with additional clean construction fill as necessary. Excess material removed from the site would be disposed of in accordance with applicable laws and regulations, including materials recycling. The soil boring test results indicate the material is suitable for use as general construction fill and/or for daily cover at a landfill. Approximately 50% of the excavated material, as currently estimated, would be placed at a site provided by the local sponsor and the other half would be disposed at a commercial landfill.

7.7 Special materials handling of excavated materials is not anticipated. A series of twelve soil borings were collected in 2003 (under Corps' contract) from both sides of the river from Michigan Avenue to the Detroit Industrial Freeway (Interstate 94), a reach of approximately 2.1 miles. Analysis of these soil borings did not indicate any contaminants at levels that would be a concern. Additionally, a Phase 1 Environmental Site Assessment was prepared in 2006 (under Corps' contract) to evaluate the potential for hazardous, toxic, and radiological waste (HTRW) being present in the areas of the proposed Sec. 1135 project. No sites were identified that were likely to impact the Sec. 1135 project construction areas. In the event of the discovery of unforeseen contaminated soils, appropriate action would be taken.

Operation and Maintenance

7.8 Upon completion of construction, project operation and maintenance responsibilities, including management of the habitat and any invasive species control measures, will be transferred to Wayne County.

Miscellaneous Project Details

7.9 The proposed action may require the construction of one or more temporary structures or temporary placement of clean construction material, upland or in-water. Temporary structures or fill material would be at Corps-approved locations, outside of any wetlands, areas containing Federal or state protected species or their critical habitat, or properties listed on or eligible for listing on the National Register of Historic Places or state-listed properties. Because the river bottom is concreted in the project reaches, the temporary stockpiling of construction materials/aids, such as stone or cofferdams, on the river bottom would not disturb habitat, and is only limited by the requirement that such stockpiling or construction aids placed in the river allows for passage of river flows to prevent any backwater effects, causing flooding upstream. Temporary activities will also include appropriate precautions against erosion and sedimentation, and other undesirable environmental impacts.

7.10 The type and location of temporary structures and/or construction materials cannot be determined at this time, since they would be incidental to the work being performed. Examples are work and storage areas, access roads, and office facilities. These construction aids would be within project boundaries or rights-of-way and would be removed when no longer needed. Temporary sites would be restored upon project completion.

7.11 Some variation from the project as described may occur with respect to sequence of activities, method of operation, or design details as a result of unanticipated design improvements, site conditions, or cost-saving measures. Any variations that result in significant changes to either the overall project design or environmental impact would require further evaluation under the National Environmental Policy Act.

8.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

8.1 Review of the proposed Sec. 1135 ecosystem restoration project indicates it would not result in significant adverse environmental effects. Nor would it be expected to result in any significant cumulative or long-term adverse environmental effects. Adverse effects would be minor, including short-term noise and air emissions from equipment operation; temporary turbidity from construction operations; disruption of some low grade vegetation, and temporary displacement of fish. The project would be beneficial by creating aquatic and terrestrial habitat with floodplain, wetland, and upland habitat for a variety of fish, birds, and other wildlife and increased connectivity between the Great Lakes aquatic ecosystem and the Rouge River watershed.

Soils

8.2 During the construction of the flood control channel in the 1960s and 1970s, the river was straightened and lined with concrete. Material excavated from the new channel alignment was used to backfill the old river channel. Within the reaches of the proposed ecosystem restoration project, soils interrelationships were destroyed through filling, mixing, and the placement of impervious surfaces associated with construction of the original flood control project.

8.3 Construction of a floodplain area along the reaches of the Section 1135 project would help naturalize the river valley and form. Beneficial impacts to soils are expected within the project reaches. The removal of unnatural fill combined with addition of native vegetation will have positive long-term effects on the soil structure.

Hazardous, Toxic, and Radiological Wastes

8.4 A series of twelve soil borings were collected in 2003 (under Corps' contract) from both sides of the river from Michigan Avenue to the Detroit Industrial Freeway (Interstate 94), a reach of approximately 2.1 miles. These borings were continuous for the first 10 feet of depth, then every 5 additional feet below that to a total depth of approximately 30 feet. The borings indicate a mixture of fill, sand, and clay in the top 20 feet of material, overlying native clays. Fill material typically consisted of fine to medium sand with clay and trace amounts of gravel. Four of the borings found broken pieces of red brick and occasional pieces of concrete. The fill material ranged in thickness from 1.5 to 8 feet, and the relative density ranged from loose to medium dense. Clays ranged from stiff to very stiff when found in the upper 8 feet, but the clay encountered below that depth was very soft to soft. Samples from these twelve borings were analyzed and the results showed no chemical evidence of potential HTRW or solid waste problems.

8.5 Additionally, a Phase 1 Environmental Site Assessment was prepared in 2006 (under Corps' contract) to evaluate the potential for hazardous, toxic, and radiological waste (HTRW) being present in the areas of the proposed Sec. 1135 project. No sites were identified that were likely to impact the Sec. 1135 project construction areas. In the event of the discovery of unforeseen contaminated soils, appropriate action would be taken.

Sediments

8.6 The entire Rouge River Watershed is designated as an Area of Concern for contaminated sediments under the Rouge River Remedial Action Plan (U.S. EPA, Great Lakes National Program Office). The lower 5.5 miles of the Rouge River, which is downstream from the current Section 1135 study reach, is designated a Michigan Act 307 site of environmental contamination because of metals and organic chemicals in the sediments (Rouge River Assessment²)

8.7 In general, the sediments in the Rouge River contain low concentrations of total polychlorinated biphenyls (PCBs) and overall metals, though some metals are present in higher concentrations (Rouge River Assessment²). Sediments passing through the Flood Control Project tend to deposit in the Federal navigation channel, located downstream of the project area. Sediments in the Federal navigation channel are moderately contaminated with heavy metals, PCBs and PAHs (Corps contract testing data).

8.8 Sediments from upstream areas rapidly flow through the concrete lined flood control channel during storm events due the transport capacity of the concrete channel; therefore, very little if any fine particle sediments occur in the reaches of the proposed ecosystem project, other than what may deposit in the bottom of the V-shaped concrete channel.

8.9 Some of the sediments carried from upstream areas would likely deposit in the newly created floodplain and side-stream wetlands, but are not expected to be a cause of adverse effects, since similar sediments exist in many areas throughout the Rouge River system. Thus, significant effects from sediment movements related to the proposed Section 1135 project, either beneficial or adverse, are not expected. Over the longer term, the side-stream wetlands could trap enough sediment to reduce water depths within the side-stream wetlands. In this case, some maintenance may be required to alleviate sediment buildup, although this is not expected to occur for many years.

Water Quality

8.10 The Rouge River has suffered from degraded water quality since approximately World War II, when urbanization and industrialization spread rapidly on the banks of the river. Municipal and industrial wastewater affects river water quality, but these effects have been moderated in more recent times by regulatory discharge limits under State Wastewater Discharge permits. The main stressor to the system now comes from wet weather pollution via surface water contamination from both point and non-point sources, such as excess lawn

chemicals, oil and grease drippings on pavements, etc, that are washed into the waterways by surface runoff, and from occasional raw sewage spills by combined sewer overflows and bacteria from leaking septic systems.

8.11 The International Joint Commission in the Great Lakes designated the Rouge River as one of the Areas of Concern because of its polluted condition. State-designated uses for the Rouge River are water contact recreation, warm water fishery, industrial and agricultural water supply, commercial and recreational navigation, and general aesthetics. In many parts of the Rouge River, these designated uses are not being met in dry or wet conditions. Consequently, fish consumption advisories are in place and the Wayne County Health Department has prohibited total body contact.

8.12 The worst water quality coincides with areas downstream of the greatest urban populations and industrial densities where conditions generally decline from upstream to downstream. Dissolved oxygen levels, temperature, water clarity, nutrient enrichment and fecal coliform are the most degraded water quality parameters in the concrete lined channel reach of the river, which has the worst water quality in the Rouge River.

8.13 Overall the Section 1135 project would have negligible effects on water quality of the Rouge River. The same degraded water and sediments would pass through the project reaches with or without the ecosystem project. A minor amount of the sediment likely would deposit in the side-stream wetlands, but would not have significant effect on water or habitat quality of the side-stream wetlands. There may be some benefit to downstream water quality due to the presence of the floodplain vegetation which would provide some filtration; however, such benefits are not expected to be significant. Improved water quality would be most noticed within the side-stream wetlands, but would be subject to mixing with lesser quality river water at times. On balance, significant water quality effects, either positive or negative, are not expected to result from the project.

8.14 During construction, some minor turbidity effects would occur when the side-stream wetlands are connected to the river, but appropriate erosion control measures would be used to minimize such effects. Cofferdams, which likely would be used for construction of the larger openings to the side-stream wetlands, will largely limit turbidity and siltation. Construction of cofferdams varies, depending on the contractor and site conditions. An example of a cofferdam that may be used in the project reach is shown in Figure 17.

8.15 The project requires State certification, or waiver thereof, pursuant to Section 401 of the Clean Water Act.



Figure 17. Cofferdam Used for Construction of River Opening to the Rouge Oxbow Project.

Ecological Resources

8.16 Much of the following discussion of ecological resources have been summarized from the Rouge River Assessment.⁴ Project effects on ecological resources are discussed following this section.

a. Plant Communities: Historically, Beech-Sugar/Maple Forest was the primary vegetation cover in the Rouge River Watershed. The Beech-Maple ecosystem occurs frequently throughout mesic (moderately moist) sites of Southeast Michigan and historically comprised the majority of the proposed Section 1135 project study area. Beeches and maples prefer cool, moist, fertile soils that are rarely disturbed by fire. American beech and sugar maple were most prevalent; however, basswood, tulip tree, white ash, red oak, and various hardwood species were also present. Currently, the corridor along the Section 1135 project reaches is predominantly commercial and industrial lands with isolated parcels of weedy and non-native vegetation. The immediate floodway and river channel is 100% paved with concrete.

b. Macro-invertebrates: The macro-invertebrate community is often the best indicator of long-term water quality and a reflection of the overall health of an aquatic system. The Rouge River within the proposed Section 1135 project area lacks significant macro-invertebrates because of the substantial channelization and concrete lining. In the areas of the lower river, that have not been channelized or dredged, the poor condition of the bottom sediments limits the survival of all but the most tolerant species. While the water quality has substantially improved over the last twenty years, it is still degraded and the benthic community may not recover without habitat restoration.

⁴ Rouge River Assessment by Jennifer D. Beam and Jeffrey J. Braunscheidel. 1998. Michigan Department of Natural Resources, Fisheries Division, Special Report 22. Ann Arbor, Michigan.

c. Fish: The size and diversity of the existing fish community is constrained by the limitations placed on upstream migration by the 4.2-mile-long concrete-lined flood control channel between Michigan Avenue and the Federal navigation project. Historically, this area of the river contained the best game fish habitat in the watershed. Currently, reduced water quality, elevated water temperatures, sparse in-water and riparian habitat severely limit fish populations and passage.

d. Historically, 59 native species of fish have been documented in the Rouge River Watershed. Species such as northern pike, white sucker, largemouth bass, walleye, channel catfish, white and black crappie, and various sunfish were present. Other fish that may have used the Rouge River system in the past include lake sturgeon, muskellunge, white bass, lake whitefish, smallmouth bass, and yellow perch. All of these are still present in portions of the Detroit River and could potentially return to the Rouge River provided habitat, water quality, and connectivity within the river and to the Great Lakes is restored.

e. In 1995, over 50 species of fish were identified in the Rouge River Watershed. Those historical species missing are generally the larger, more desirable game fish such as walleye and smallmouth bass and water quality sensitive species such as minnows, darters and sculpins. Fish communities in the downstream portions of the Rouge River are severely degraded and appeared strongly limited by poor water quality. Fish consumption advisories remain in effect for PCBs and mercury.

f. Within the project areas, the Henry Ford Estate Dam (located about two-thirds river mile upstream of the Upper Rouge Section 1135 project reach) impedes upstream migration in the Main Stem of the Rouge River, blocking off vast upstream areas including the Middle and Upper Branches of the Rouge to most fish. However, the Lower Branch of the Rouge River, which joins the Main Stem about 1,000 feet below the Henry Ford Estate Dam, is currently accessible to fish from the Detroit River system for a distance of about 10.5 miles upstream. The Lower Branch offers a natural river channel, bordered by numerous wetlands and floodplains associated with various parks and undeveloped areas.

g. In 1995, the natural river area below the Henry Ford Estate Dam exhibited a diverse fish community with 34 species including several game fish species. Observed numbers were too low to support a recreational fishery, but illustrate the importance of the connection of this part of the Rouge River with the Detroit River, even though the connection is seriously compromised by poor habitat conditions in the concrete channel. A few fish were also collected in the vicinity of the Federal navigation project turning basin, just below the concrete channel reach; these were mostly non-native and tolerant species such as goldfish, carp, and gizzard shad.

h. The Oxbow Restoration was constructed in the spring of 2002. A fish survey in August 2002 showed the following species in the Oxbow (Table 3):

Table 3. Name and Relative Abundance of Fish Species in the Restored Oxbow as of August 2, 2002.

Common Name	Scientific Name	Abundance
Common Carp	<i>Cyprinus carpio</i>	High
Black Bullhead	<i>Ameiurus melas</i>	High
Yellow Bullhead	<i>Ameiurus natalis</i>	High
Bluntnose Minnow	<i>Pimephales notatus</i>	High
Fathead Minnow	<i>Pimephales promelas</i>	High
Largemouth Bass	<i>Micropterus salmoides</i>	Low
Smallmouth Bass	<i>Micropterus dolomeui</i>	Low
Bluegill Sunfish	<i>Lepomis macrochirus</i>	High
Green Sunfish	<i>Lepomis cyanellus</i>	Medium
Goldfish	<i>Carassius auratus</i>	Low
White Sucker	<i>Catostomus commersoni</i>	Medium
Golden Shiner	<i>Notemigonus crysoleucas</i>	Low
Gizzard Shad	<i>Dorosoma cepedianum</i>	High
Channel Catfish	<i>Ictalurus punctatus</i>	Low

From <http://www.rougeriver.com/geninfo/new/fishsurvey.html>

i. Amphibians and Reptiles: There are 49 species of amphibians and reptiles associated with the Rouge River Watershed. Most have been confirmed in the watershed, with the rest having the Rouge River Watershed within their range. It is likely that few species of amphibian and reptile occur within the proposed project areas, other than perhaps snapping turtles, which have a high level of tolerance to poor water quality and habitat degradation.

j. Birds: The Rouge River Watershed serves as an important stopover point for a variety of migrating waterfowl. Over 200 acres of nature preserve, located about half a mile upstream on and adjacent to University of Michigan, Dearborn Campus, (UMDC) and the Henry Ford Estate attracts many species of water-dependent birds. This preserve was established by Henry Ford who worked with the Michigan Audubon Society to restore habitat to attract birds to the property year-round (Dearborn Historian, 1978). Ninety-one species of waterfowl have been documented, mostly from the UMDC. Peregrine falcons, American egrets, and great blue herons nest in the watershed. Floodplains and wooded

corridors along the various branches of the river, much of which is public parkland, serve as important habitat for some parts of these species' life history.

k. Mammals: Although the Rouge River corridor provided a great deal of habitat for many mammals, historically, the project areas have a large amount of open land and development, interspersed with remnant wooded areas. Mammals along the project reaches will be largely those tolerant of urban situations, such as raccoons, opossums, and various rodents.

Project Effects on Ecological Resources

8.17 Project effects on ecological resources are summarized here and detailed in the following sections. The project would not be expected to result in significant adverse effects on fish and wildlife habitat because the project would result in improved habitat throughout the project area and would positively affect adjacent habitats. Benefits include improved fish passage; habitat for mammals, birds, reptiles, amphibians, and macro-invertebrates; and increased native plant species richness and abundance.

8.18 Plant communities would be more diverse with a higher quality of plant types because of the more varied conditions afforded by wetland fringes and floodplains. The side-stream wetlands will provide off-channel habitat and wetland quality as a haven from the flows in the main channel, thereby improving fish passage through the concrete-lined flood control channel. Existing water quality may become a limiting factor once sufficient habitat is restored. The establishment of floodplains, wetlands, and native plant communities in the floodway and immediate adjacent uplands will provide quality habitat for insects, birds, reptiles and amphibians, and small mammals throughout the site.

Aquatic Habitat/Fisheries

8.19 The provision of side-stream wetlands with off-channel open-water pools surrounded by structure and vegetation will provide aquatic habitat with natural diversity that will enable fish to rest, forage, and reproduce along the concrete channel in the project reach, and will assist fish in passing through the concrete channel section of the river. Fish species that would likely use the side-stream wetlands are members of the sunfish family (Centrarchidae), bullheads (Ictaluridae), members of the minnow family (Cyprinidae) and young of the year that were spawned from upstream migration including northern pike and pickerel (Esocidae), suckers (Catostomidae) and members of the family Percidae including yellow perch and walleye. The side-stream habitat will also be valuable to reptiles and amphibians, benthic organisms, birds and mammals.

Exotic/Nuisance Species

8.20 Exotic species are those introduced to an ecosystem from other geographic areas. Many exotics are also nuisance species because, having not been a long term part of the local ecosystem, they tend to upset the natural balance that has been achieved over time within a

particular ecosystem. Nuisance species often crowd out native species and multiply to occupy large portions of the habitat area, thereby substantially diminishing the habitat quality through loss of diversity and quality of plant and animal components.

8.21 The most prevalent nuisance plant in the project area is phragmites⁵, which grows in dense stands up to 15 feet tall that degrade wetlands and crowd out native plants and animals. One of the largest stands of phragmites observed is just west of the Southfield Freeway and extends approximately 250 feet along the north bank (Figure 18). Smaller stands exist in many locations along the project reach of the river.



Figure 18. Phragmites stand located upstream of the Southfield Freeway (photo August 2010).

8.22 Phragmites stands spread into adjacent habitat by rhizome (root) sprouts, which makes control of established stands very difficult. Phragmites also spreads by seed into disturbed areas, such as will occur in constructing the ecosystem restoration project. According to the Phragmites Group website⁶, “Seedlings grow slowly during the first year and do not tolerate competition. In other words, seed establishment can only happen on bare soil that is moist but not flooded.” The project proposal includes extensive plantings of native vegetation, both for ecosystem restoration and erosion control. These plantings will help prevent establishment of phragmites and other exotic plants.

8.23 A recent site visit to the Oxbow in August 2010 revealed the presence of purple loosestrife, phragmites, and a variety of other exotic species, yet the site retains a diversity of plant species and habitat. This shows that since the Oxbow was restored in 2002, it still retains good habitat. Similar results are expected for the currently proposed project. The potential for the project site being overrun by exotic plant species is limited because the project includes native plantings throughout the areas disturbed by project construction. The open water fish

5 While there is one strain of Phragmites thought to be native and lacking significant invasiveness, the introduced strain is much more widespread in distribution and is highly invasive.

6 <http://www.phragmites.crad.ulaval.ca/en/projetsen.asp> (Center for Research in Planning and Development, Laval University, Québec, Qc, Canada.)

habitat areas within the side-stream wetlands would be constructed to a depth that precludes aquatic plant establishment.

Threatened and Endangered Species

8.24 The following species are Federally listed as occurring or potentially occurring in Wayne County:

Indiana bat (*Myotis sodalists*), “endangered”

Eastern massasauga (*Sistrurus catenatus catenatus*), “candidate”

Northern riffleshell mussel (*Dysnomia torulosa rangiana*) “endangered”

Rayed bean mussel (*Villosa fabalis*), “candidate”

Eastern prairie fringed orchid (*Plantathera leucophaea*), “threatened”

8.25 Two species, state-listed as threatened, the compass plant (*Silphium laciniatum*) and cup plant (*Silphium perfoliatum*), occur in isolated portions of the riparian zone along the Rouge River.

8.26 The project sites do not have suitable habitat for any of the listed species, Federal or state. It is highly unlikely that these species have been present in the Section 1135 project reaches since 1978 when the river channel and immediate riparian zone were paved with concrete. Current conditions in the project reaches are not conducive to these plants and animals. Therefore, the project would have no effect on Federally listed species, nor would it adversely affect any state-listed species.

Wetlands and Waters of the United States

8.27 There are no wetlands present within the Section 1135 project reach. The project will create wetlands and aquatic habitat, partly restoring habitat lost when these areas of the river were channelized for flood control. The project is within the waters of the United States; therefore, a review of the project pursuant to Section 404(b)(1) of the Clean Water Act has been done and is included as Attachment 2.

Floodplains

8.28 The project sites are within the 100-year floodplain, which is constrained in the project reach by the high banks on both sides of the river. The project would not encourage floodplain development, but would restore some natural floodplain functions through the creation of a narrow band of floodplain along both sides of the river. A small increase in flood stages is predicted within the project reaches and associated Rouge Oxbow restoration. Hydraulic modeling shows no increase (i.e., <0.01 foot) in the 100-yr flood elevation upstream or downstream of the project site. The proposed action complies with the Federal Executive Order on Flood Plain Management (E.O. 11988) because there is no practical alternative to

construction in the flood plain and the alternative selected avoids unacceptable flood plain effects.

Coastal Zone Management

8.29 The coastal zone boundary, as defined by the State of Michigan, extends up the Rouge River, stopping a short distance downstream from the I-94 expressway. Since the project is entirely upstream of the I-94 expressway, there would not be any direct effects on the coastal zone. No indirect effects on the coastal zone are expected to result from construction or operation of the project as appropriate erosion and turbidity controls would be used during construction until vegetation is established to provide natural erosion control.

Recreation, Noise and Aesthetics

8.30 The Sec. 1135 project would not have significant adverse effects on recreation, noise, or aesthetics. Temporary and minor noise effects will occur during construction. All motorized construction equipment is required to have an approved noise reduction system. The project sites are not within established recreational areas and there would be no impact on recreation from construction.

8.31 Aesthetic impacts of construction would not be significant. The existing project site is aesthetically degraded by the concrete channel, encroached by weedy vegetation. The ecosystem restoration project will restore aesthetic quality to the riparian corridor of the Rouge River between Southfield Freeway and Rotunda Drive by removing most of the visible concrete and replacing it with floodplains, wetlands, and native vegetation.

Traffic

8.32 Traffic impacts would be temporary, comprised generally of increased truck traffic from hauling excavated soil and concrete materials to a disposal site. All truck traffic to and from the project sites would use approved hauling routes and abide by local, state, and federal requirements. Since there is industry nearby and the area is already subject to truck traffic, project traffic effects would not be significant, but would be similar to existing traffic conditions.

Air Quality

8.33 Effects on air quality would arise from emissions of construction equipment. All equipment would be required to meet emission standards and emissions are expected to be minor. Construction of the proposed project would be short term. Thus, the proposed project would be exempted as *de minimis* (Latin for 'of minimal importance') and meet the Conformity Requirements under Section 176(c) of the Clean Air Act, as amended, and 40 C.F.R. 93.153.

Cultural Resources

8.34 : Before 1972 the Rouge River meandered through the project areas in a natural channel through an undeveloped floodplain. In 1972, as part of the Corps flood control project, the channel was straightened and lined with concrete, the new river banks were graded, and the former, meandering river channel was filled and/or abandoned in isolation from the main river channel. The construction area has been thoroughly disturbed by post-1970 development and does not include any known cultural resources.

8.35 The only National Register of Historic Places site in the immediate vicinity of the project study area is the Greenfield Village and Henry Ford Museum complex (recently re-named “The Henry Ford”), which abuts the Corps flood control project on the west along the Upper Rouge Section 1135 project reach, between Michigan Avenue and the Southfield Freeway. The project would result in a slight increase to the 100-year flood elevation within the recently completed Rouge Oxbow habitat restoration project which is on the property of The Henry Ford. However this Oxbow is one of the former river meanders that were filled when the Corps flood control project was constructed and is highly disturbed from previous construction activity.

8.36 There are no known archeological resources or historic properties in the areas of potential effect for the proposed Rouge River ecosystem restoration project. Therefore, the Detroit District of the Corps has determined pursuant to 36 CFR 800.4 that no historic properties will be affected by the proposed project.

8.37 As a precaution, the construction contract for this project will include provisions for the protection of any cultural resources discovered during construction. These provisions shall include, at a minimum, the requirement to cease all work in the immediate area of a discovered cultural resource until the situation is properly evaluated, and the requirement to immediately provide verbal and written notice to the non-Federal sponsor and Corps. The Corps will notify the State Historic Preservation Office. In such a case, construction would cease until there is proper disposition of the discovered cultural resource.

Cumulative Impacts

8.38 The proposed ecosystem restoration project would not result in significant adverse cumulative environmental impacts. The project site is degraded as a direct result of historical action that long ago eliminated the aquatic and riparian habitat through the project reaches. The overall cumulative impact of the ecosystem restoration project is beneficial environmentally, socially and economically through the addition of naturalized open space to a heavily urbanized area that would be used by flora, fauna and local people. The project acts cumulatively with the recent Oxbow restoration project to increase habitat along the concrete channel. Proposed future action in the watershed that enhances habitat and/or water quality would provide cumulative improvements to the ecosystem in combination with the presently proposed project.

Other Resources

8.39 The Sec. 1135 project is not expected to significantly affect community cohesion, desirable community growth, tax revenues, property values, public facilities, public services, regional growth, employment or the labor force, business and industrial activity, farmland, or man-made resources because the project does not involve these resources in a substantive manner. There is no farmland within the project limits.

8.40 The project would not cause displacement of people because the project does not involve any homes or other private properties. Bordering homes and neighborhoods would not be adversely impacted by the ecological restoration project; rather, local residents would gain a restored open space to view and appreciate nature. The project would not adversely impact local employment or the economy, and would provide some additional, temporary employment for construction of the project.

9.0 STATE AND FEDERAL AGENCY COORDINATION

9.1 Information on the previously proposed Section 1135 ecosystem restoration project was originally coordinated in 2006 with the U.S. Fish and Wildlife Service; the U.S. Environmental Protection Agency; the Michigan Department of Environmental Quality (MDEQ), Land and Water Management Division; the Michigan Department of Natural Resources (MDNR), Wildlife Division; the MDNR Fisheries Division, Southeast Michigan Field Office; the Michigan State Historic Preservation Office (SHPO); and various Native American Tribes and groups.

This Environmental Assessment for the currently re-scoped project will be made available to these agencies and tribal interests, as well as other agencies, groups and interested public for comment. Comments from this public review of the Environmental Assessment will be evaluated and taken into consideration in the final decision for the proposed project (See Section 11.0).

State Historic Preservation Office

9.2 State Historic Preservation Office reviewed the preliminary project information and determined that “**no historic properties are affected** within the area of potential effects of this undertaking” (correspondence of June 12, 2006). They also noted that documentation regarding the project must be made available to the public and interested parties, including making a good faith effort to identify interested Native American Indian parties. This Environmental Assessment (EA) discusses such cultural resource identification and evaluation efforts and will be made available to Indian tribes and groups, as well as Federal, state, and local agencies, and the general public for review and comment.

U.S. Fish and Wildlife Service

9.3 The U.S. Fish and Wildlife Service (the Service) provided extensive discussion of the project and fish and wildlife resources of the project areas in the form of a Draft Coordination Act Report (DCAR) pursuant to the Fish and Wildlife Coordination Act (Attachment 3). The following discussion addresses the recommendations section of the DCAR. Note that when the DCAR was written the alternatives were formulated differently (see former alternatives listing on page 9 of attached DCAR, Attachment 3). For clarity, the alternative references in the USFWS recommendations have been revised to the current numbering in the discussion below.

a. Service Recommendation: “The Service recommends concrete removal as part of [Alternative 6] (our basic position) with an adaptive management approach to adjust to changing circumstances. Such circumstances include the hydraulic consequences of [Alternative 6]’s other features (floodplain construction and side-stream wetlands); if later hydraulic studies show that the backwater effect, if any, to be generated by the in-stream structures are compatible with the [Corps] flood control project, then the Service would prefer to support [an] Alternative [with in-stream structures]. Current understanding suggests [Alternative 6] is likely to be the selected plan of the Corps.”

b. Corps Response: Hydraulic modeling shows that Alternative 6 is feasible with the floodplain construction and side-stream wetlands, but that the addition of in-stream structure causes unacceptable backwater effects beyond the study reaches that cannot be practicably mitigated. If future hydraulic studies of the completed ecosystem restoration project show that in-stream structures are feasible, Wayne County would be free to propose such modifications.

c. Service Recommendation: “[Addition of in-stream structure] provided superior numbers of habitat units compared to [Alternative 6]. [Added in-stream structure] would also increase the habitat quality of the stream channel, the only alternative other than total concrete removal that improves stream channel bottom habitat.”

d. Corps Response: While the in-stream structures would improve in-stream habitat quality, because of the concrete channel liner the improvement is largely limited to providing resting points for fish passing upstream. In-stream structure was evaluated and was dropped from further consideration because hydraulic modeling showed it would increase flood stages up to 1 mile upstream from the project reach. . However, the side-stream wetlands of Alternative 6 provide aquatic habitat in an off-channel setting and are expected to improve the aquatic diversity of the area. The openings along the sidestream wetlands would provide resting sites for fish passing upstream.

e. Service Recommendation: “The Service does not support Alternative 1 (No Federal Action) as it would provide no habitat improvement over the existing situation, which is sorely in need of correction in this stretch of the River Rouge.”

f. Corps Response: Noted.

g. Service Recommendation: “This recommendation [Alternative 6 with adaptive management] fits with many other habitat studies, such as the International Lake Ontario St. Lawrence River Study who’s goals were to ensure that all types of native habitats (floodplain, forested and shrubby swamps, wet meadows, shallow and deep marshes, submerged vegetation, mud flats, open water and fast flowing water) and shoreline features (barrier beaches, sand bars/dunes, gravel/cobble shores and islands) are represented in an abundance that allow for the maintenance of ecosystem resilience and integrity over all seasons; and to maintain hydraulic and spatial connectivity of habitats to ensure that fauna have temporal and spatial access to a sufficient surface of all the types of habitats they need to complete their life cycles.”

h. Corps Response: The Rouge River ecosystem restoration project was developed in the same spirit as the International Lake Ontario St. Lawrence River Study. The goal was to restore as much and as diverse of a habitat assemblage as possible, focusing on the aquatic ecosystem in a riverine context. The constraints of maintaining necessary flood flow conveyance and the limited available space to expand laterally from the river channel limits options for habitat development. Adaptive management would be implemented where applicable to future restoration along this concrete reach and as necessary to maintain the habitat features of the current proposal.

i. Service Recommendation: “The Corps and non-Federal sponsor (Wayne County) are expected to accomplish necessary construction, and to initially share implementation and operation of the project, including any proposed conservation measures that may be included in the final project design. Once the project operates satisfactorily, the Corps will return all responsibility for operation and maintenance to the non-Federal sponsor. The Corps will remain at-hand for consultation to the non-Federal sponsor regarding questions toward the function or performance of any aspect of the project, as designed and constructed. Maintenance of the constructed project, including the addition of any in-stream structures (if later determined to be hydrologically feasible) will become the non-federal sponsor’s responsibility. For restoration and enhancement measures, cost-sharing provisions, as established under the Federal Water Project Recreation Act, as amended (P.L. 89-72), and/or other authorities may also apply to this project.”

j. Corps Response: Noted: In-stream structures were dropped from further consideration because hydraulic modeling showed it would increase flood stages up to 1 mile upstream from the project reach. However, in-stream structures could be evaluated for future restoration project farther downstream along the concrete channel.

Michigan Department of Natural Resources and Environment

9.4 MDNRE Wildlife Division: The Michigan Department of Natural Resources and Environment (MDNRE), Wildlife Division, provided information on state-listed species that may be present in the project area. A response was prepared (as summarized in the discussion of Threatened and Endangered Species in the previous section above) and the MDNR Wildlife

Division concluded that “the project should have no direct impacts on known special natural features at the location(s) specified if it proceeds according to the plans provided” (correspondence of July 31, 2006).

9.5 MDNRE Water Resources Division: The MDNRE Water Resources Division provided comments by electronic mail on August 9, 2010:

MDNRE Comment: The concrete that is removed must be disposed into a licensed landfill or reused in compliance with Part 115, Solid Waste Management, of the NREPA.

Corps Response: Noted. Concrete disposal will be conducted in compliance with applicable laws and regulations.

MDNRE Comment: The excavated soils must be properly characterized to demonstrate that they meet the inert standards of Part 115 or properly disposed into a licensed landfill or CDF

Corps Response: The current plan is to take the soil to a landfill. If another site is identified later, it would be reviewed pursuant to the National Environmental Policy Act and applicable disposal standards, and any necessary testing would be conducted.

MDNRE Comment: Use native Michigan plants in the project.

Corps Response: The construction contract will specify native plantings are to be used in the project.

MDNRE Comment: Conduct monitoring for five years to document success of project both the stream and the buffer.

Corps Response: A monitoring plan has been developed to survey plants along the floodplains in years 0, 2, and 5. Fish in the side-stream wetlands would be surveyed in years 2 and 5.

MDNRE Comment: Place conservation easement on the buffers if possible.

Corps Response: The Corps cannot place a conservation easement on the buffers because the project, upon completion of construction, would be turned over to Wayne County. However, the restored habitat cannot be altered without Corps approval because it is part of the Section 1135 project. Any proposals for significant modifications to the project would be coordinated for comment and preparation of applicable National Environmental Policy Act documentation, such as a supplemental Environmental Assessment.

9.6 MDNRE Floodplain Engineering: The MDNRE Floodplain Engineer provided comments by Memorandum of July 20, 2010, through the Water Management Division:

MDNRE Comment: The proposed cut on both sides of the channel will increase the 100 year flood plain. New maps are currently under review and you may want to submit the revised floodplain delineation.

Corps Response: If the Section 1135 study proceeds to construction, then revised floodplain data will be provided to the applicable Federal Emergency Management Agency office. After the project is constructed, the Corps will coordinate the new floodplain data with the Federal Emergency Management Agency so they can update their flood maps as necessary.

MDNRE Comment: On the north side of the channel, downstream of the Southfield Freeway, is it possible to connect the flood shelf or side-stream wetlands to the existing wetlands?

Corps Response: Connecting the created side stream wetlands with existing wetlands was not considered. The existing wetlands are outside the scope of the project which is limited to the County right-of-way along the river channel. Such a connection could be considered for a future project though.

MDNRE Comment: Please consider removing the entire concrete channel. This would improve the sediment transport, increase the roughness of the channel and improve the biological function of the stream.

Corps Response: The concrete below the normal water surface elevation is needed as a pilot channel to guide the river. Complete concrete removal would likely change the meander of the river affecting right-of-ways and adjacent real estate. Complete concrete removal may also result in unacceptable backwater effects on flood stages.

MDNRE Comment: Please consider using root wads on the outside meander bends, log revetments, woody vegetation or equivalent soft engineering methods to protect the stream bank.

Corps Response: These methods were not modeled, but could result in increased water levels upstream during flood flows. Root wads, logs, and other structure are planned for the off-channel side-stream wetlands.

MDNRE Comment: If the entire concrete channel is removed, it is recommended to install a grade control at the upstream starting point of the project.

Corps Response: See response above regarding complete concrete removal.

MDNRE Comment: Please consider cutting the bank at the channel forming flows. It is expected that this may be near the 1.2 year return interval event.

Corps Response: The current design has the banks being cut just below the 1 year return interval.

MDNRE Comment: We are concerned that the side-stream wetlands may be impacted by sediment deposition. Please consider installing an inlet structure that allows the sediment transport thru the main channel while diverting flows for the wetland system. Typically, an in-stream structure is used in conjunction with the weir. Attached you will find details of a cross vane and W vane with a weir that is used to divert flow without impacting the sediment transport. We have successfully installed a W vane (without the weir) on the Grand River, Dimondale Dam removal without impacting the 100 year flood elevation.

Corps Response: The culvert at the upstream end would be installed at a higher elevation to minimize the amount of sediment that is carried into the side-stream wetlands, and so at times may be above the water surface. The culvert at the downstream end would be placed lower, since it is not in a position that would allow sedimentation into the side-stream wetlands. It is likely that some sediment will deposit into the side-stream wetlands, such as from overland flow of floodwaters. We do not anticipate significant buildup in the shorter term. Long-term maintenance is a responsibility of the County including clearing excessive sediment from the off-channel pool areas of the side-stream wetlands.

MDNRE Comment: Please consider allowing one growing season before the side stream wetland is connected to the river.

Corps Response: This may have some benefits; however, flows within the side-stream wetlands are not expected to be sufficient to disturb the development of plantings in the side-stream wetlands. Additionally, it would raise costs as there would be a second set of equipment mobilization and demobilization.

MDNRE Comment: Please consider installing bio-engineered materials that can handle higher near bank velocities along the transition zone downstream of the remaining hard armored structures, such as the CSO outfall.

Corps Response: Erosion control around remaining hard structures is to be achieved by leaving sufficient existing concrete to effectively transition to the flood plain areas without the need for supplemental hard structured erosion control. Beyond that the desired bank material is natural vegetation.

9.7 MDNRE Remediation and Redevelopment Division: The MDNRE Remediation and Redevelopment Division (RRD) provided comments by Memorandum of July 16, 2010, through the Water Management Division:

MDNRE Comments: In summary, the RRD provided comments regarding potential sites of environmental contamination and soil management. They noted that there are no state-listed sites of environmental *contamination or underground storage tanks in the areas where project activities would occur*. The RRD also reviewed historical aerial photographs of the project site, noting that there were no buildings or structures in the project site, but that fill activities were apparent from before 1949. They noted that when the Oxbow was restored, fill material removed from the Oxbow had some contaminants that would result in soil management procedures, with some material classified as solid waste under state regulations. The RRD notes that because of the time period of the fill activities and the lack of historic data on the fill material composition, there could be industrial materials in the filled areas. Depending on the character of the material, various handling requirements may be in effect. They recommend avoidance of the filled former channels if possible and that borings be taken in the areas where excavation is to occur.

Corps Response: A series of twelve soil borings were collected in 2003 under Corps' contract from both sides of the river from Michigan Avenue to the Detroit Industrial Freeway (Interstate 94), a reach of approximately 2.1 miles. Analysis of these soil borings did not indicate any contaminants at levels that would be a concern. Additionally, a Phase 1 Environmental Site Assessment was prepared in 2006 under Corps' contract to evaluate the potential for hazardous, toxic, and radiological waste (HTRW) being present in the areas of the proposed Sec. 1135 project. No sites were identified that were likely to impact the Sec. 1135 project construction areas. Contract specifications will include precautionary clauses and procedures to address the discovery of any unforeseen contaminants, including temporary containment until a disposition plan is determined, and any materials testing needed for disposal at an appropriate facility.

10.0 CONCLUSIONS

10.1 The proposed ecosystem restoration project has been reviewed pursuant to the following Acts and Executive Orders: Fish and Wildlife Act of 1956; Fish and Wildlife Coordination Act of 1958; National Historic Preservation Act of 1966; National Environmental Policy Act of 1969; Clean Air Act of 1970; Executive Order 11593, Protection and Enhancement of the Cultural Environment, May 1971; Coastal Zone Management Act of 1972; Endangered Species Act of 1973; Clean Water Act of 1977; Executive Order 11988, Flood Plain Management, May 1977; and Executive Order 11990, Wetland Protection, May 1977. The proposed project has been found to be in compliance with these acts and executive orders for this phase of the study.

10.2 Pursuant to the Clean Water Act (CWA), a Section 404(b)(1) Evaluation of the environmental effects of the discharge of fill material into waters of the U.S. has been prepared

(Attachment 2). The Section 404(b)(1) Evaluation concludes with the determination that "the proposed action is in compliance with Section 404 of the Clean Water Act." A Section 401 (CWA) water quality certification, or waiver thereof, would be obtained from the State of Michigan for the Section 1135 project work.

10.3 This Environmental Assessment has been prepared in accordance with the National Environmental Policy Act (NEPA); the Council on Environmental Quality, *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* (40 CFR Parts 1500-1508); and the Corps of Engineers, *Policy and Procedure for Implementing NEPA* (33 CFR Part 230).

10.4 This Environmental Assessment concludes that 1) there are no significant cumulative or long-term adverse environmental impacts associated with the proposed ecosystem restoration project; 2) the benefits outweigh the minor, temporary impacts that may result; and 3) the project does not constitute a major Federal action significantly affecting the quality of the human environment.

11.0 PUBLIC REVIEW

11.1 This Environmental Assessment will be made available to the public for a 30-day review period. Following this period and a review of the comments received, a final determination will be made by the District Engineer regarding the necessity of preparing an Environmental Impact Statement (EIS).

11.2 Based on the conclusions of this Environmental Assessment, it appears that preparation of an EIS will not be required. Therefore, a Preliminary Finding of No Significant Impact (FONSI) is included in the following section of this Environmental Assessment. If the District Engineer determines that an EIS is not necessary, the Preliminary FONSI would be finalized and the proposed ecosystem restoration project implemented.

12.0 (PRELIMINARY) FINDING OF NO SIGNIFICANT IMPACT

12.1 In accordance with the National Environmental Policy Act of 1969, the Detroit District, Corps of Engineers, has assessed the environmental impacts of constructing an ecosystem restoration project at the site of the 1962 Rouge River Flood Control Project. The proposed action is removal of the existing concrete channel liner down to the normal water surface elevation and excavation of the river banks to create floodplains and two side-stream wetland areas. The project reach for the proposed action extends 0.8 mile along the concrete-lined channel between the Southfield Freeway and Rotunda Drive in Dearborn, Michigan.

12.2 An Environmental Assessment (EA) of the proposed action has been completed. The EA indicates that the proposed ecosystem restoration would not result in significant adverse environmental effects nor would it be expected to result in any significant cumulative or long-term adverse environmental effects. Adverse effects would be minor, including short-term noise and air emissions from equipment operation; temporary turbidity from construction

operations; disruption of some low grade vegetation, and temporary displacement of fish and other wildlife. The project would be beneficial by creating aquatic and terrestrial habitat with floodplain, wetland, and upland for a variety of fish, birds, and other wildlife and increased connectivity between the Great Lakes aquatic ecosystem and the Rouge River Watershed.

12.3 The proposed action complies with the Federal Executive Order on Flood Plain Management (E.O. 11988). Pursuant to the Clean Water Act (CWA), a Section 404(b)(1) Evaluation of the environmental effects of the discharge of fill material into waters of the U.S. has been prepared. The Evaluation concludes that "the proposed action is in compliance with Section 404 of the Clean Water Act." The state has provided⁷ water quality certification, pursuant to Section 401 of the Clean Water Act.

12.4 The EA and Section 404(b)(1) Evaluation, along with a review of comments received during public review of the EA, indicates that construction of the proposed ecosystem restoration along the Rouge River between Southfield Freeway and Rotunda Drive, in Dearborn, Michigan, does not constitute a major Federal action significantly affecting the quality of the human environment; therefore, an Environmental Impact Statement will not be prepared.

Date Signed

Michael C. Derosier
Lieutenant Colonel, U.S. Army
District Engineer

⁷ Note, Water Quality Certification has not yet been received, but is anticipated.

Wetland Species

SCIENTIFIC NAME	COMMON NAME
ALISMA SUBCORDATUM	WATER PLANTAIN
IRIS VERSICOLOR	BLUE FLAG IRIS
NUPHAR ADVENA	YELLOW WATER LILLY
NYMPHAEA ODORATA	WHITE WATER LILLY
PONTEDERIA CORDATA	PICKEREL WEED
PELTANDRA VIRGINICA	ARROW ARUM
POTAMOGETON NODOSUS	LONG LEAF POND PLANT
SCIRPUS ACUTUS	HARDSTEM BULRUSH
SCIRPUS VALIDUS	SOFT-STEM BULRUSH
SPARGANIUM EURYCARPUM	BUR REED
SCIRPUS FLUVIATILIS	RIVER BULRUSH
SCIRPUS PUNGENS	THREE-SQUARE BULRUSH
SCHIZACHYRUM SCOPARIUM	LITTLE BLUESTEM
SCIRPUS ATROVIRENS	GREEN BULRUSH

Upland Species

SCIENTIFIC NAME	COMMON NAME
AMELANCHIER LAEVIS	ALLEGHENY SERVICEBERRY
ASTER NOVAE-ANGLIAE	NEW ENGLAND ASTER
ACER RUBRUM	RED MAPLE
CELTIS OCCIDENTALIS	HACKBERRY
CORNUS STOLONIFERA	RED-OSIER DOGWOOD
LIATRIS ASPERA	ROUGH BLAZING STAR
MONARDA FISTULOSA	PRAIRIE BERGAMOT
PANICUM VIRGATUM	SWITCH GRASS
RHUS AROMATICA 'GRO-LOW'	'GRO-LOW' FRAGRANT SUMAC
RUDBECKIA HIRTA	BLACK-EYED SUSAN

Stormwater Seed Mix

SCIENTIFIC NAME	COMMON NAME
PERMANENT GRASSES/SEDGES	
<i>Carex vulpinoidea</i>	Brown Fox Sedge
<i>Eiccharis obtusa</i>	Spike Rush
<i>Elymus virginicus</i>	Virginia wild rye
<i>Glyceria striata</i>	Fowl manna grass
<i>Juncus effusus</i>	Common Rush
<i>Leersia oryzoides</i>	Rice Cut Grass
<i>Panicum virgatum</i>	Prairie Switch Grass
<i>Scirpus validus</i>	Great bulrush (Softstem)
TEMPORARY COVER	
<i>Agrostis alba</i>	Redtop
<i>Avena sativa</i>	Seed oats
<i>Lolium multiflorum</i>	Annual rye
FORBS	
<i>Alisma spp</i>	Water Plantain
<i>Asclepias incarnate</i>	Swamp Milkweed
<i>Bidens, spp.</i>	Bidens, various
<i>Helenium autumnale</i>	Sneezeweed
<i>Mimulus ringens</i>	Monkey Flower
<i>Penthorum sedoides</i>	Ditch Stonecrop
<i>Polygonum pennsylvanicum</i>	Smartweed
<i>Sagittaria arifolia</i>	Broad-Leaf Arrowhead

ATTACHMENT 1

Plantings Used In The Oxbow Restoration

Mesic-to-dry Tallgrass Prairie Mix

SCIENTIFIC NAME	COMMON NAME
PERMANENT GRASSES	
<i>Andropogon gerardii</i>	Big bluestem grass
<i>Andropogon scoparius</i>	Little bluestem grass
<i>Bouteloua curtipendula</i>	Six Oats Grass
<i>Elymus canadensis</i>	Prairie Wild Rye
<i>Panicum virgatum</i>	Prairie Switch Grass
<i>Sorghastrum nutans</i>	Indian Grass
TEMPORARY COVER	
<i>Avena sativa</i>	Seed oats
<i>Lolium multiflorum</i>	Annual rye
<i>Phleum pratense</i>	Timothy
FORBS	
<i>Anemone cylindrica</i>	Thimbleweed
<i>Asclepias tuberosa</i>	Butterfly weed
<i>Aster azureus</i>	Sky-blue aster
<i>Aster laevis</i>	Smooth Blue Aster
<i>Aster novae-angliae</i>	New England Aster
<i>Baptisia leucantha</i>	White Wild Indigo
<i>Baptisia leucophaea</i>	Cream wild indigo
<i>Cassia fasciculata</i>	Partridge Pea
<i>Coreopsis palmata</i>	Prairie coreopsis
<i>Desmodium illinoense</i>	Illinois sensitive plant
<i>Desmodium illinoense</i>	Illinois Tick Trebil
<i>Echinacea purpurea</i>	Purple coneflower
<i>Eryngium yuccifolium</i>	Rattlesnake master
<i>Lespedeza capitata</i>	Round-Headed bush Cover
<i>Liatis aspera</i>	Rough Blazing Star
<i>Liatis pycnostachya</i>	Prairie blazing star
<i>Lupinus perennis</i>	Wild Lupine
<i>Monarda fistulosa</i>	Prairie Bergamot
<i>Parthenium integrifolium</i>	Wild Quinine
<i>Potentilla arguta</i>	Prairie cinquefoil
<i>Pycnanthemum virginianum</i>	Virginia Mountain Mint
<i>Ratibida pinnata</i>	Yellow Coneflower
<i>Rudbeckia hirta</i>	Black-Eyed Susan
<i>Siphium integrifolium</i>	Roasin Weed
<i>Siphium laciniatum</i>	Compass Plant
<i>Siphium terebinthinaceum</i>	Prairie Dock
<i>Solidago nemoralis</i>	Old-field goldenrod
<i>Solidago rigida</i>	Stiff Goldenrod
<i>Solidago speciosa</i>	Showy goldenrod
<i>Veronicastrum virginicum</i>	Culver's Root
<i>Zizia aurea</i>	Heart-leaved meadow parsnip

ATTACHMENT 2

CLEAN WATER ACT
SECTION 404(b)(1) EVALUATION
Of the Effects of Placing Fill Material into the Waters of the United States

Rouge River
Section 1135 Ecosystem Restoration
Wayne County, Michigan

I. PROJECT DESCRIPTION

- a. Project Location and Authority: This Section 404(b)(1) Evaluation addresses proposed ecosystem restoration within the concrete flood control channel reach of the Rouge River, extending approximately 0.8 miles from the Southfield Freeway to Rotunda Drive in Dearborn, Michigan. The project is authorized by Section 1135 (Environmental Protection and Restoration, Project Modification for Improvement of the Environment) of the 1986 Water Resources Development Act (PL 99-662).
- b. Project Description: Construction includes removal of the existing concrete channel liner down to the normal water surface elevation and excavation of the river banks to create a floodplain and side-stream wetland areas. Grading would be required to create appropriate slopes. Side-stream wetlands likely would be constructed in the dry and then the opening and culverts constructed. All work, land based and in-water will be conducted with appropriate erosion and/or turbidity controls to prevent sedimentation into the river and to minimize turbidity effects from constructing the side-stream wetland openings and culverts. This may entail the use of cofferdams around the side-stream wetland openings during construction. Work would likely be sequenced to limit the total amount of exposed soils at any one time.
- c. Description of Fill Material: After removal of concrete and excavated soil material, which is to be taken off site, the Section 404 fill action includes grading the riverbanks, placement of culverts and fish habitat structure (such as stone or logs) within the side-stream wetlands, and other incidental fill action associated with these activities. Only clean construction fill, stone and habitat materials would be used in the construction. Excavated material from project construction may be reused in the project if suitable.
- d. Description of Habitat: There is little quality habitat as the river in the project reach is a concrete lined V-shaped channel, with no floodplain and the upper banks above the concrete are occupied largely by nuisance plant species.

II. FACTUAL DETERMINATION

a. Physical Substrate Determinations: Substrate is concrete. Some sediment may be present in bottom of V-shaped channel.

b. Water Circulation, Fluctuation, and Salinity Determinations: No adverse effects. Water circulation is from upstream to downstream and will not be changed by the project. Water level fluctuations will be modified in that flood events will spread over a wider area through the project reaches because of the creation of floodplain areas. The project is expected to not increase 100-year flood elevations and floodplain area within the project reach and into the Oxbow. Water level fluctuations outside the project reaches will be unaffected (i.e., less than 0.01 foot).

c. Suspended Particulate/Turbidity Determinations: Turbidity from connecting constructed side-stream wetlands to river channel would be limited by erosion control measures, likely through use of cofferdams. Therefore, there would be no adverse effects from suspended particulates or turbidity.

d. Contaminant Determinations: Clean fill materials (such as rocks, logs, etc) or suitable on-site material (see I.c., above) would be placed in side-stream wetlands for habitat variety and concrete and/or riprap would be used to form and protect the openings to the side-stream wetlands. Riverside banks of the side-stream wetlands may be protected with riprap also to prevent undermining of remaining channel liner.

e. Aquatic Ecosystem and Organism Determinations: Site is concrete and does not support significant habitat. No significant adverse effects. Addition of off-channel aquatic habitat in side-stream wetlands will provide diverse aquatic habitat along the concrete channel.

f. Federal- and State-Listed Species: No Federally listed “threatened” or “endangered” species are known to be present at the project sites. Two state-listed species occur in isolated portions of the riparian zone along the Rouge River, but the project sites do not have habitat suitable to these species.

g. Proposed Disposal Site Determinations: No significant adverse impacts on municipal or private water supplies, recreational or commercial fisheries, water related recreation, aesthetics, parks, monuments, wilderness areas, research sites, or similar preserves would occur. None of these features and amenities occurs in the project reaches, or in the areas immediately downstream. The project would provide localized benefits to the aquatic ecosystem.

h. Determination of Cumulative and Secondary Effects on the Aquatic Ecosystem: No significant adverse cumulative or secondary impacts are expected to occur because the existing habitat is degraded and mostly nonexistent owing to the presence of the concrete channel lining.

III. FINDING OF COMPLIANCE

No significant adaptations of the Guidelines for Specification of Disposal Sites for Dredged or Fill Material (40 CFR part 230) were made relative to this evaluation. The proposed action would not violate applicable water quality standards; nor would it result in significant adverse effects on human health and welfare, aquatic life, or other wildlife dependent on the aquatic ecosystem, nor on the diversity, productivity, and stability of the aquatic ecosystem. Significant adverse effects on recreational, aesthetic, and economic values would not occur. Coordination with the U.S. Fish and Wildlife Service indicates that no Federally-listed “threatened” or “endangered” species have been identified that would be affected by the project nor are there any state-listed species known to be present at the project site. Appropriate steps taken to minimize adverse effects on the aquatic ecosystem include erosion control measures during construction, and specific environmental protection clauses in the project contract specifications to ensure protection of natural resources. The proposed action would be beneficial by restoring some of the natural ecological functions of the river corridor and aiding in fish passage between the Great Lakes/Detroit River ecosystem and the Rouge River Watershed. On the basis of the Guidelines, it has been determined that the proposed action is in compliance with Section 404 of the Clean Water Act.



United States Department of the Interior

FISH AND WILDLIFE SERVICE
 East Lansing Field Office (ES)
 2651 Coolidge Road, Suite 101
 East Lansing, Michigan 48823-6316

COPY

IN REPLY REFER TO:

April 24, 2007

Note, The alternatives were different when this letter was written. However, the USFWS' preferred alternative (Alternative 4 here) is essentially the same as Alternative 6 of the current alternatives. The earlier alternatives are listed below on page 9 of this letter.

Lt. Colonel William J. Leady
 District Engineer-Detroit District
 U.S. Army Engineer
 P.O. Box 1027
 Detroit, Michigan 48231

Dear Colonel Leady:

Please accept our recommendations on the proposed Upper and Lower River Rouge Project, as authorized via Section 2(b) of the Fish and Wildlife Coordination Act (48 Stat. 401 as amended: 16 U.S.C. et seq.). The attached draft Fish and Wildlife Coordination Act (FWCA) report fulfills the requirements under the 2006 Support Agreement and Scope of Work between our agencies.

Our report provides: a description, based on a literature search and site visit of fish and wildlife resources and habitats of the area (including endangered species); a discussion of potential impacts of the project alternatives on these resources; and a discussion of suggested restoration, enhancement, and conservation measures for proposed project alternatives.

Overall, we support concrete removal as part of Alternative 4, with adaptive management of the hydraulic consequences of Alternative 4's other features (floodplain construction and sidestream wetlands). If later hydraulic studies show that the backwater effect, if any, generated by the in-stream structures of Alternative 5 are compatible with the flood control project, then we would prefer to support that Alternative. We do not support Alternative 1 (No Federal Action) as it would provide no habitat improvement over the existing situation, which is in need of correction along this stretch of the River Rouge.

This report will be provided to the Michigan Department of Natural Resources and our Fisheries Program. Please notify Bob Kavetsky, of this office, at (517) 351-5293 of any decisions regarding our recommendations and of any changes in the project plans.

Sincerely,

Michael E. DeCapata
 for Craig A. Czarniecki
 Field Supervisor

cc: MDNR, Livonia, MI (Attn: Jeff Braunscheidel)
 USFWS, Alpena Fishery Resources Office, Alpena, MI (Attn: Jim Boase)

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U.S. Fish and Wildlife Service

Fish and Wildlife Coordination Act

**Draft Section 2(b) Report
Upper and Lower River Rouge**

Region 3 - "Great Lakes -Big Rivers"

*Prepared by
East Lansing Field Office
East Lansing, Michigan*



Draft Upper and Lower Rouge Fish and Wildlife Coordination Act 2(b) Report

Executive Summary

The River Rouge runs through a highly urbanized area, with a population within the watershed of over 2 million people. More than 50% of the watershed's land-use is residential, commercial, or industrial, with increasing development pressures in the headwaters. Four miles of the lower reach, from Michigan Avenue to the Turning Basin, were diverted into a concrete channel in the 1970s as part of a flood control project. The lower section of the mainstem still exhibits a Great Lakes influence in species composition, but the concrete channel and the dam at the Henry Ford Estate inhibit fish passage into the upper Rouge River system. Excessive flow instability, degraded water quality due to sewage and storm water, sedimentation from erosion and storm water flows, fragmentation from dams, paving of the stream channel, and habitat destruction still negatively affect fish assemblages in the River Rouge watershed (Beam and Braunscheidel 1998).

The concrete channel currently extends up the riverbanks and prohibits a natural riparian zone, eliminates ecological quality and diversity, and inhibits public access to the river's edge. A component of four of the six Alternatives proposes removing the concrete in a two mile section of the river such that for each existing cross-section from the edge of the riverbanks, to the normal (mean) water surface elevation (NWSE) (approximately 574.3 feet National Geodetic Vertical Datum 29), the concrete lining would be eliminated. This would require removal of approximately 37 feet of concrete from the upper edge to NWSE on each side, which represents about a 7-foot vertical drop in the upper edge elevation of the concrete lining. The concrete "V" channel that comprises the riverbed would remain to discourage channel erosion.

The Service position supports concrete removal as part of Alternative 4 (our basic position), with an adaptive management approach to adjust to changing circumstances. Such circumstances include the hydraulic consequences of Alternative 4's other features (floodplain construction and sidestream wetlands); if later hydraulic studies show that the backwater effect, if any, to be generated by the in-stream structures of Alternative 5 are compatible with the flood control project, then the Service would prefer to support that Alternative. Current understanding suggests Alternative 4 is likely to be the selected plan of the Corps. The Service does not support Alternative 1 (No Federal Action) as it would provide no habitat improvement over the existing situation, which is sorely in need of correction in this stretch of the River Rouge.

Identification of Purpose, Scope, and Authority

Authorized by the Flood Control Act of 1962, the existing flood control project was designed to prevent flooding of the Dearborn/Melvindale area of the Rouge River. In 1976, the Detroit District Corps of Engineers completed construction of the Rouge River Flood Control Project, which straightened and paved a 4.2-mile stretch of the river from

Michigan Avenue downstream to the Turning Basin near Dix Avenue and the Ford Motor Rouge Plant.

The Flood Control Project shortened the river by 8,600 feet (1.6 miles) and was designed to handle the 100-year storm event with maximum flows of 24,000 cubic feet per second. The channel consists of a concrete-lined, v-shaped center section with slopes of 1 : 6 projecting to a 50-foot wide horizontal turfed berm. The channel has an average depth of 20 feet. The right-of-way established for the Flood Control Project is controlled and maintained by Wayne County.

The Flood Control project works by increasing the carrying capacity of the channel and the velocity of the water, moving flows through the area quickly so that flooding does not occur upstream; however, the concrete channel has removed all habitat and riverine functions from this reach. Based on information supplied by the prospective project sponsor (Wayne County) and the Michigan Department of Natural Resources, the existing flood control project has had a significant, adverse impact on 1) fluvial geomorphology, 2) hydrology and hydraulics, 3) riparian vegetation communities, and 4) species richness of the Rouge River valley. The project sponsor seeks large-scale restoration of ecological integrity (including fish passage), heritage preservation, and increased recreation and economic development, yielding social and cultural benefits while still maintaining the integrity of the flood control project.

The proposed modification to this flood control project involves partial removal of the concrete pavement and restoration on the Upper and Lower Main Rouge River, defined as the upstream half of the concrete-lined flood control project, which is approximately 2.1 miles long and extends from Michigan Avenue to Interstate 94. The downstream half of the concrete-lined flood control project, from Interstate 94 to the turning basin at the Ford Rouge Complex, is heavily industrialized and, therefore, has more limited recreational opportunities, which are a priority of the local sponsor. Additionally, many downstream utility crossings would complicate the project and its construction; but depending on the success of the currently proposed project, the County could pursue some downstream restoration later. The Corps also maintains a navigation channel to authorized depths in the Lower Rouge River from its confluence with the Detroit River to approximately 3 miles upstream at the turning basin at Dix Avenue.

The Corps initiated the study process in 2001 with the preparation of Upper and Lower Rouge Section 1135 Preliminary Restoration Plans. Funding to complete the feasibility phase was provided in 2006. During the feasibility phase, Upper and Lower Rouge Section 1135 Detailed Project Reports (DPR) are being prepared to evaluate ecological restoration alternatives and present preliminary designs. The DPRs will be accompanied by appropriate National Environmental Policy Act (NEPA) documentation. While there will be two DPRs because the Upper and Lower Rouge studies are separately authorized, a single NEPA document will be prepared for continuity of the environmental analysis.

This report constitutes the report of the Secretary of Interior as required by Section 2(b) of the Fish and Wildlife Coordination Act (FWCA). The Service has not prepared a FWCA report during the long history of this flood control project. In May of 2005, prior to initiation of the Service's involvement in this Report, the Service responded to a request for suggested plantings on the potential upper and lower River Rouge projects. The process for production of this report was initiated with the Scope of Work, signed May 24, 2006. The Scope asks the Service to: 1) conduct a literature review and field investigation of the fish and wildlife resources of the project area, 2) attend one or two interagency meetings, and 3) prepare a Draft and Final Coordination Act Report (FCAR).

The Coordination Act Report was based upon information collected during the literature review, field work, and meeting attendance, as well as design information supplied by the Corps. The FCAR was to include the following information:

1. a description (based on a literature and previous field investigation) of the fish and wildlife resources and habitats of the project area, including endangered or threatened species,
2. a discussion of potential impacts of the project alternatives on fish and wildlife resources, citing specific evidence supporting each identified potential impact, and
3. a discussion of, and rationale for, any suggested restoration, enhancement, and/or conservation measures that may be appropriate for the proposed project alternatives.

Acknowledgment of Input, Coordination, and Concurrence (or Explanation of Non Concurrence) of State Fish and Wildlife Agency

The State of Michigan Department of Natural Resources, Fisheries Division provided substantial input into the ideas and designs of Alternatives 4 and 5 (Remove Concrete to Normal Water Surface Elevation With Excavation of Banks to Produce Sidestream Wetlands, and the same Alternative with the addition of In-stream Structures). Both of these proposals incorporate sidestream wetlands/cutoff channels adjacent to the main channel of the Rouge River, between the upper limit of the project upstream of Evergreen/Michigan Avenue and I-94, as a means of providing resting areas for passing fish. Most of the Michigan DNR input was provided at an April 12, 2006 collaboration meeting at the Henry Ford Estate and an additional meeting with the Service on August 17, 2006 at Wayne County Environmental Department Headquarters.

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Discussion of Prior Studies and/or Reports

No previous Planning Aid Letters or reports have been prepared by the Service for this project; however, numerous similar or parallel Corps projects have provided relevant information. Some that were documented and that were reviewed and relied on include:

USACE-LRE. 2003. Reconnaissance Level Study, Main Rouge River, Michigan Gateway Master Plan Evaluation.

USACE-LRE. 2003. 1135 Preliminary Restoration Plan: Henry Ford Museum and Greenfield Village Oxbow - Dearborn, Michigan.

USACE-LRE. 2004. 1135 Preliminary Restoration Plan: Rouge River Downstream of Rotunda Drive, to I-94, Wayne County, Michigan.

USACE-LRE. 2004. 1135 Preliminary Restoration Plan: Rouge River Upstream of Rotunda Drive to Michigan Avenue, Wayne County, Michigan.

Beam, Jennifer D. and Jeffrey J. Braunscheidel. 1998. Rouge River Assessment. Michigan Department of Natural Resources, Fisheries Division, Special Report 22. Ann Arbor, Michigan.

Description of the Study Area

The Rouge River watershed drains 467 squares miles and empties into the Detroit River at Zug Island, located near the middle of the eastern border of Wayne County, Michigan (Figure 1).

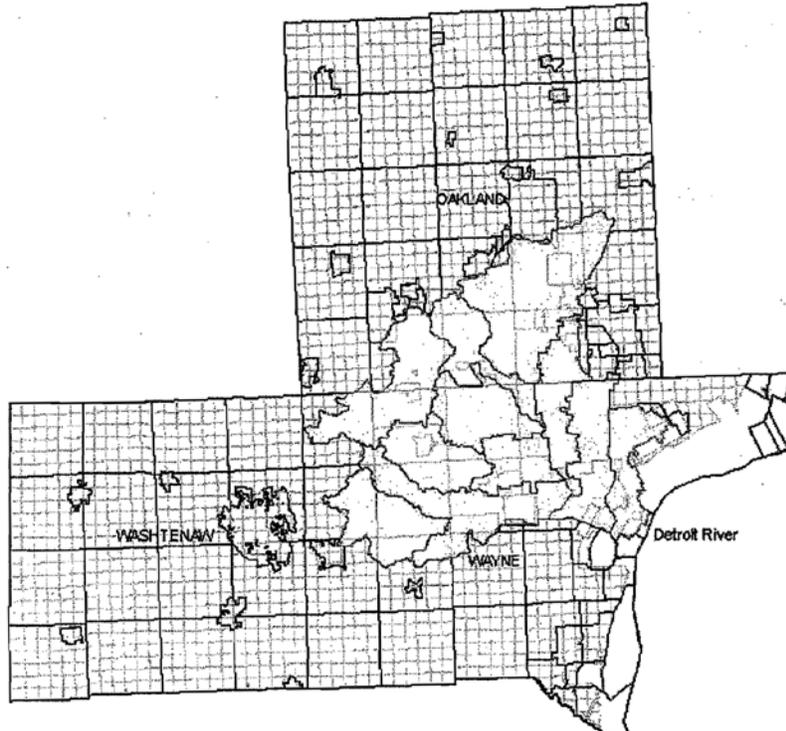


Figure 1. Rouge watershed and subwatersheds.

This river contains three main tributaries: Upper, Middle and Lower Branches, which all join at the approximately 44 mile long mainstem (Knutilla 1969). The Upper Branch has two cool water tributaries and flows in a southeast direction for 21 miles to the mainstem (Beam and Braunscheidel 1998). The Middle Branch measures 30 miles in length and its southern arm contains the only cold water streams in the watershed (Beam and Braunscheidel 1998). The Lower Branch, which is approximately 27 miles long, is considered to have a high density of streams for its drainage area (Beam and Braunscheidel 1998). Four miles of the mainstem in Dearborn, near Michigan Avenue and continuing downstream, were diverted into a paved channel for flood prevention and control in the 1970s (Figure 2).

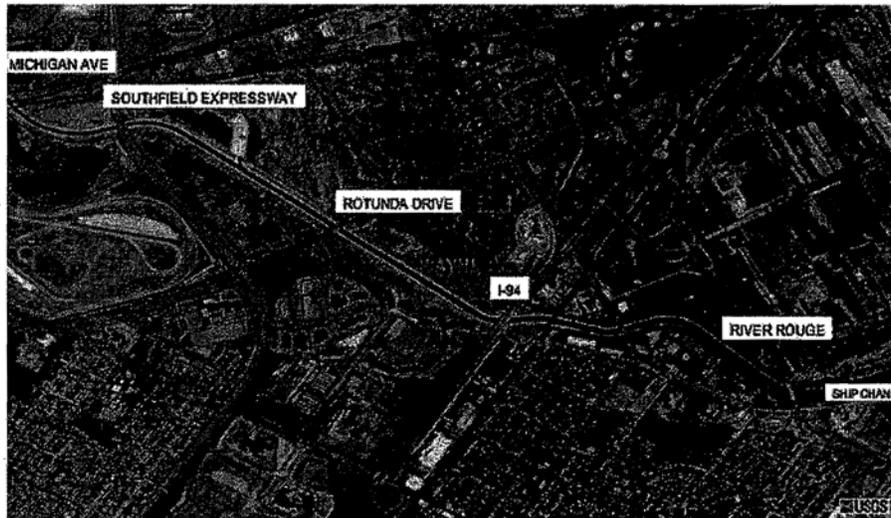


Figure 2. Aerial photo of the River Rouge project area.

Historically, the Rouge River Flood Control Project area consisted primarily of climax beech–sugar maple forest. Other historic forest types in this location included a small section of mixed hardwood swamp west of the Rouge River, hardwood swamp, oak–hickory forest, and shrub swamp/emergent marsh leading to the Detroit River. Habitat for two State of Michigan threatened plant species, cup plant (*Silphium perfoliatum*) and compass plant (*Silphium laciniatum*), was also once available within the flood zone of this area.

Approximately 95% of the watershed's soils are currently composed of silt loam or smaller particles (Beam and Braunscheidel 1998). Silt loams are heavy soils with low permeability such that surface water moves overland to the lowest point rather than soaking into the ground (Beam and Braunscheidel 1998). The headwaters of the mainstem consist of silt loam or loam, sandy loam and sandy clay loam. The area within the city of Detroit, prior to urbanization, was 100% sandy clay loam, indicating that the river has been a surface water stream with flows greatly affected by precipitation.

Within the entire Rouge watershed, historic accounts document more than 60 native fish species, including brook lamprey, American eel, lake herring, minnows, catfish, northern pike, brook silversides, sticklebacks, sculpin, and various sunfish and perch species. According to Beam and Braunscheidel 1998, many of these species were still present and abundant within the last decade; however, a number have declined and are rare. In 1995, a total of 53 species were identified (Beam and Braunscheidel 1998), but this figure includes species, such as trout and perch, which were stocked for recreational purposes. Several other species, such as lake sturgeon, muskellunge, white bass, lake whitefish, and

smallmouth bass, have been found in neighboring streams or connecting systems, including the Detroit River, and were most likely present in the Rouge drainage area.

Forty-nine species of reptiles and amphibians are known to occur within the Rouge River, the watershed or its associated wetlands. Rarer species generally associated with the Rouge drainage system include the small-mouthed salamander; Blanchard's cricket frog; the spotted, wood, Blanding's and eastern box turtles; Kirtland's water snake, eastern massasauga rattlesnake, black rat snake, and eastern fox snake (Beam and Braunscheidel 1998).

The Rouge River watershed serves as an important migratory bird stopover site. Ninety-one species, including neo-tropical songbirds, waterfowl, and raptors, have been documented (Beam and Braunscheidel 1998 and Rouge River Bird Observatory 2006). Most of the birds have been found on the University of Michigan Dearborn campus, which contains over 200 acres of nature preserve. Habitat for many of these species is located in the floodplains and wooded riparian corridors, much of which is public parkland (Beam and Braunscheidel 1998).

The riparian and wooded corridor also provides habitat for a variety of mammalian species, including raccoons, skunks, mink, and red, gray, fox and flying squirrels (Beam and Braunscheidel 1998). It is also possible that the federally endangered Indiana bat (*Myotis sodalis*) may have used forested areas for summer roosting and breeding.

Explanation of Fish and Wildlife Resource Concerns, Problems, Needs, and Planning Objectives

The concrete channelization and the elimination of the shrub swamp/emergent marsh that was once present along the last two miles of the Rouge River leading to the Detroit River has changed the character of the river's mouth by removing fish spawning and nursery habitats along the river (Beam and Braunscheidel 1998), hindering fish passage up the Rouge from the Detroit River, and removing or altering habitat for migratory birds, reptiles, amphibians, and mammals. Many populations of the fish species now present in the Detroit River and neighboring streams may have migrated up the Rouge in the past and may be reestablished if the habitat is restored.

The planning objective established for this report is to conserve in-kind habitat values associated with in-stream and riparian features of benefit to fish and wildlife populations in the River Rouge basin. Within the Alternatives presented, opportunities exist for increased fish passage and spawning, benefits to invertebrate species as well as terrestrial wildlife such as avian and herpetofauna. The Flood Control project reach as it currently exists hinders fish movement from the Detroit River upstream into potential spawning and foraging habitat in the Rouge as well as from the surrounding watershed into the lower reaches of the Rouge. Taking no action would continue to limit fish migration upstream and downstream of this area thus limiting species diversity in the Rouge River.

Description of Fish and Wildlife Resource Conditions

Hydrographs of the River Rouge depict “flashy” flows, with an almost immediate response to a rain event followed by a rapid recovery. This shows the influence of impervious surfaces, combined sewer overflows (CSOs), and storm sewers on river flows and indicates that the watershed is primarily driven by surface water (Beam and Braunscheidel 1998).

According to the U.S. Environmental Protection Agency (USEPA 2005), beneficial use impairments of the River Rouge include Restrictions on Fish & Wildlife Consumption, Degradation of Fish & Wildlife Populations, Fish Tumors or Other Deformities, Degradation of Benthos, Restrictions on Dredging Activities, Eutrophication or Undesirable Algae, Beach Closings (reported locally under “Swimming and Other Water-Related Activities”), Degradation of Aesthetics, and Loss of Fish and Wildlife Habitat. The USEPA (2005) cites the probable causes for the degradation of fish and wildlife populations as non-point source pollution, point source stormwater discharges, combined/sanitary sewer overflows, contaminated sediments, stream flow, illegal discharges, and point source discharges. CSO events are expected to increase in number and severity in the Great Lakes region due to climate change (Scheraga 2007). Within the watershed, there are more than 150 permitted CSOs and 500 storm water discharge permits. Poor water quality from CSOs has affected aquatic invertebrates. These invertebrate communities have been severely degraded in the three major branches and most of the mainstem (Beam and Braunscheidel 1998).

Historically, the lower section of the mainstem supported sizeable game fish populations. The lower section of the River Rouge mainstem still exhibits a Great Lakes influence in species composition, but the concrete channel and the dam at the Henry Ford Estate inhibit fish and other aquatic species passage into the upper Rouge River system. Other factors negatively affecting species assemblages in the Rouge River watershed include excessive flow instability, degraded water quality due to sewage and storm water, sedimentation from erosion and storm water flows, and fragmentation from dams, paving of the stream channel, and habitat destruction (Beam and Braunscheidel 1998).

Endangered Species

This proposed project occurs within the potential range of some federally listed species; however, the Fish and Wildlife Service’s records do not indicate the presence of listed species or critical habitat in or near the project area. Although our records for some listed species are incomplete, the description of the project location and features provided by the Corps and the nature of the proposed activities indicate that listed species or potential habitat will not be impacted. This precludes the need for further action on this project as required by the Endangered Species Act. If, however, more than six months pass, project plans change, or new information becomes available that indicates listed, candidate or proposed species or critical habitat may be affected, the Corps should further consult with this Service’s East Lansing Field Office.

Identification of Alternative Plans Considered, Outcome of Plan Selection Process, and Alternative(s) Evaluated and Addressed by the FWS in this Report

In order to accomplish project goals, several alternative solutions are being considered and evaluated for the proposed Section 1135 project. All of the proposed alternatives (except the "No Federal Action" alternative) considered for the modification of the existing Rouge River flood control project involve removal of part or most of the existing concrete sides of the channel.

**RELATION TO CURRENT
(2010) ALTERNATIVES**

The alternatives include:

- **Alternative 1** - No Federal Action; _____ **REMAINS ALT 1**
- **Alternative 2** - Remove Concrete to Normal Water Surface Elevation; _____ **NOT FEASIBLE**
- **Alternative 3** - Remove Concrete to Normal Water Surface Elevation With Excavation of Banks; _____ **NOW ALT 4**
- **Alternative 4** - Remove Concrete to Normal Water Surface Elevation With Excavation of Banks and Addition of Sidestream Wetlands; _____ **NOW ALT 6**
- **Alternative 5** - Remove Concrete to Normal Water Surface Elevation With Excavation of Banks, Sidestream Wetlands & In-stream Structures, and _____ **NOT FEASIBLE**
- **Alternative 6** - Total Concrete Removal & River Restoration. _____ **NOT FEASIBLE**

These alternatives will be evaluated in greater detail based on further input from hydraulic and hydrologic analysis, project designers, ecologists and biologists, and the Non-Federal sponsor (Wayne County).

Alternative 1 - No Federal Action

In this alternative, the Corps would leave the original flood control project untouched; the concrete banks would remain in place and no shoreline improvements would be initiated. If the Corps does not continue with this Section 1135 project, the non-federal sponsor (Wayne County) or any of the other stakeholders would not have the authority to alter the current flood control project. Thus, none of the functions and values of the river system would be restored in the channelized reach.

Alternative 2 - Remove Concrete to Normal Water Surface Elevation (NWSE)

This alternative would consist of removing the concrete from the upper edge of the riverbanks, down slope to the normal (mean) water surface elevation, which is approximately 574.3 feet (National Geodetic Vertical Datum 29), for each existing cross-section. This would require removal of approximately 37 feet of concrete from the upper edge to NWSE on either side, which represents about a 7-foot vertical drop in the upper

edge elevation of the concrete lining. The concrete "V" channel that comprises the riverbed would remain to discourage channel erosion. The now barren banks would be graded and planted with native grasses and other native low-growing vegetation to the water's edge. The current channel profile would remain largely unchanged. Approximately 38,000 cubic yards of concrete would be removed for recycling or other disposal under this alternative.

Alternative 3 - Remove Concrete to NWSE and Excavate Banks

This alternative consists of removing the concrete banks (as in Alternative 2) above the normal (mean) water surface elevation and excavating the banks to produce a floodplain area, consisting of a gently sloping wet meadow to moist (mesic) meadow above the mean water surface, 50 to 150 feet landward, transitioning into an upland (shrub/scrub to forested). This river plain would mimic similar plateau elevations in natural reaches of the Rouge River in this vicinity. For example, a bioengineered streambank example exists at Ford Field Park in the City of Dearborn on the banks of the Lower Rouge. An elevated step would remain on the south bank in the river right-of-way associated with a planned walking trail/bike path. The plateau excavation would accommodate the planting of native riparian vegetation (grasses, forbs, sedges and rushes) to the riverbanks. This will create a diverse habitat for a variety of terrestrial animals, insects and birds that require a natural land/water transitional zone. The photo below is of Ford Field Lagoon in Dearborn (MI) upstream of the project reach.



Photo courtesy Ford Motor Company

The bank excavation serves to compensate for the removal of concrete and would also help compensate for any loss of flood flow, capacity and storage due to the addition of vegetation to the river's edge. Added vegetation would consist of little to no woody material as not to restrict flood flows appreciably. A hydraulic model is being utilized to investigate the feasibility and extent of excavation required for this alternative. Also, vegetation inclusion, type and location are being guided through the use of Manning's coefficient of roughness to determine water flow over floodplains. The actual amount of concrete to be removed and excavated for the purpose of establishing habitat would be carefully determined so that the functionality of the existing flood control project will not be compromised. Approximately 350,000 cubic yards of excavated soil and fill material and about 38,000 cubic yards of concrete would be removed for recycling or other disposal under this alternative.

Alternative 4 - Remove Concrete to Normal Water Surface Elevation, Excavate Banks, and addition of Side-stream Wetlands

This alternative consists of removing the concrete banks above the normal (mean) water surface elevation and excavating the banks to produce a floodplain and restore riparian habitat. Further excavation would occur to produce constructed sidestream wetlands and floodplain moist (mesic) meadows.

As in Alternative 3, the banks of the concrete channel would be removed to the elevation of the mean water level. This alternative would consist of removing approximately the upper seven feet of the concrete down to the approximate mean river level of 574.3' feet (NGVD 29).

This alternative includes the excavation of the existing sloped banks to create a more gently sloping to mainly flat mesic meadow just above the mean water surface, with additional excavation to produce four sidestream wetlands on the north side of the river, with the recreational trail on the south side. The excavations would be connected to the main channel via a "cut" that would be seventy feet wide and several feet below the mean water surface. Culverts at each end would allow fish access to the sidestream wetlands adjacent to the main channel, even during low water periods in the river.

In these wetlands, rocks, basking logs, and emergent and wet meadow plants would be introduced. Strategically placed rock piles would be sited on the upstream ends of the wetlands to provide further protection during periods of high (storm) flows. As a result, the sidestream wetlands proposed under this alternative would provide supplementary diverse habitat while creating protected resting, hiding and foraging areas at several locations along this 2.2-mile river course.

The deeper sidestream and wet meadow excavation would further serve to compensate for any loss of flood flow due to the addition of vegetation in the river channel. Added vegetation would consist of little to no woody material as not to restrict flood flows, and emergent grasses would populate the shallow portions of the wetland. Deeper portions of the wetlands would be several feet deep to allow for cooler water areas to reduce fish die-

off and to retard emergent plant growth.

The results of the hydraulic modeling scenarios examined by the Corps have shown that the lengths of the sidestream wetlands could be increased to allow for the largest possible beneficial habitat areas within project constraints. The lengths will be 1,800 and 1,952 feet between the Southfield Expressway and Rotunda Drive and 1,419 feet each in the reach between Rotunda Drive, and I-94. They begin about 300 feet from the face of the bridges and have about 250 feet of separation between them.

A hydraulic model is also being utilized to investigate the feasibility and extent of excavation required for this alternative, including the quantity of the features. Also, vegetation inclusion, type and location are being guided through the use of Manning's coefficient of roughness to determine water flow over floodplains. The actual amount of concrete to be removed and excavation for the purpose of establishing habitat would be carefully determined so that the functionality of the existing flood control project will not be compromised. Approximately 450,000 cubic yards of excavated soil and fill material and about 38,000 cubic yards of concrete would be removed for recycling or other disposal under this alternative.

Alternative 5 - Remove Concrete to Normal Water Surface Elevation with Excavation of Banks, Sidestream Wetlands & In-stream Structures

This alternative is exactly the same as Alternative 4 except for the addition of in-stream structures to aid in the passage of fish. In Alternative 4, the concrete channel would remain devoid of habitat and flow breaking structures, thus creating a quite inhospitable situation for fish passage. Through the addition of ten low profile pre-cast concrete structures, (similar to those used for vehicular parking management) placed on the sides of the river bottom and oriented perpendicular to the flow, breaks in flow would be created. These structures would have to be designed and arranged to remain in place and not impact the currently-authorized flood control project.

A pedestrian bridge is also being proposed within the upper reach of the project area that will have an unacceptable backwater effect if the in-stream structures are used. If the bridge can be relocated in a way that reduces the adverse hydraulic effects then in-stream structures could be compatible. If the bridge location is not able to be changed in this manner, in-stream structures may still be added eventually, following an adaptive management approach, but more likely would be added to the concrete lined channel downstream of the project reach. Approximately 450,000 cubic yards of excavated soil and fill material and about 38,000 cubic yards of concrete would be removed for recycling or other disposal under this alternative.

Alternative 6 - Remove All of the Concrete in the Channel.

This alternative proposes to remove all of the concrete in the channel and on the banks of the river to produce a naturalized river and to excavate the riverbanks as in Alternative 3 above.

The linear orientation of the channel would remain as constructed with the existing flood control project but all of the concrete would be removed (except in the vicinities of bridges where erosion protection is critical), including that below the water surface. The channel would then naturally self-widen due to erosion and scour to take on a more natural appearance. Rocks and emergent plantings would be placed along and in the river to provide fishery and riparian habitat as well as in-stream complexity. Intensive armoring (and future maintenance) would be required to prevent the channel from undercutting any of the several bridges in the project reach, or from undercutting adjacent properties and causing property damage. Under this alternative, the converted-to-mud river bottom would also now support increased populations of amphibians, insects and other aquatic species that inhabit benthic environments.

Some minor grading would occur along the riverbanks to support bioengineered streambank stabilization work. Approximately 450,000 cubic yards of excavated soil and fill material and about 200,000 cubic yards of concrete would be removed for recycling or other disposal under this alternative.

Comparative Hydraulic Modeling of the Alternatives

The Corps produced a hydrologic and hydraulic analysis (U.S. Army Corps of Engineers. 2006b) to determine the hydraulic viability of the six alternatives. The viable Alternatives remaining after this analysis were 1, 3, and 4. Alternative 3, removal of concrete and excavation of the banks, would result in the least impact to the 100-year flood water surface and energy grade elevations. The addition of sidestream wetlands under Alternative 4 caused a slight increase in backwater effect over alternative 3. Although there were some 100-year floodplain elevation increases experienced in the project area for this alternative, all increases dissipated to less than 0.01 feet from Michigan Avenue upstream. It should be noted that 100-year flood water elevation increases in the area of the Henry Ford oxbow outside of the applicant's property would need a Michigan Department of Environmental Quality affected property owner statement signed by the property owner in order to obtain a floodplain permit. This statement is required from impacted property owners when an increase of 0.01 foot or greater in the 100-year flood water surface/energy grade elevation is a result of a proposed project. If Alternative 5 is to be further analyzed, a mitigation plan would be required for the increases of greater than 0.01 foot upstream of the project reach. This could be accomplished by reducing the Manning's coefficient of roughness values through reduction in proposed vegetation (U.S. Army Corps of Engineers. 2006b).

Description of the Selected Plan and Other Plans Evaluated by FWS

The selected plan is Alternative 4 as described above. The sidestream wetlands are proposed to be placed on a single side of the river; the opposite side would provide public access by a bike/jogging trail. It is expected to also become popular with fishermen eventually if functions and values of wetlands are sufficiently restored. It is expected that the newly-created habitat will provide resting areas for such evaluation species as bluegills, which DNR sampling shows do occur in selected reaches of the river system

(Beam and Braunscheidel 1998). As a popular and prolific fish species, bluegills will likely provide attraction to the riverbanks and wetlands for a variety of anglers and nature viewers that desire this recreation.

Alternative 5 would have the same benefits as Alternative 4, and added benefits as well. Under Alternative 5, conditions would be much more conducive to fish passage. Not only would the ten in-stream structures facilitate fish passage, but they would also increase the habitat quality of the stream channel. The most benefit from structures will be from the sidestream wetlands, but the instream structures should be seriously considered as later enhancements.

Description of Impacts of Selected Plan and Other Alternatives

Table 1 shows an Impacts matrix for the Corps' Recommended Plan, Alternative 4. The addition of In-stream Structures to this Plan to produce Alternative 5 would not increase the cost of the project significantly and could be added under an adaptive management approach later as more information is gathered from monitoring the initial project construction.

Table 1. Impacts Matrix for Upper/Lower Rouge Project Using Sidestream Wetlands (Alternative 4). Addition of *in-stream structures as in Alternative 5 shown for comparison but is not part of Alternative 4.

<i>Impact</i>	<u>Features of Proposed Plan (Alternative 4) and Alternative 5</u>			
	<i>Remove concrete</i>	<i>Excavate floodplain</i>	<i>Sidestream wetlands</i>	<i>*In-stream structures</i>
Removal of natural substrate		X	X	
Reduction in habitat diversity				
Reduction of river miles				
Elimination of riparian vegetation		X	X	
Loss of upland hardwoods				
Reduction in frequency and/or duration of overbank flooding				
Lowering of water table		X		
Reduction in water quality				
Increase in water velocities				
Elimination of shallow water spawning and nursery habitat				
Reduction in invertebrate biomass and diversity				
Reduction in fish biomass and diversity				
Loss/degradation of adjacent floodplain wetlands				

*NOTE THAT BY ADDING THE IN-STREAM STRUCTURES OF ALTERNATIVE 5 NO PERCEPTIBLE NEGATIVE IMPACTS WOULD HAVE RESULTED

Evaluation and Comparison of the Selected Plan and Other Evaluated Alternatives

Preliminarily, the Corps' Draft EA indicates Alternative 5 provides more habitat units than Alternative 4. As proposed, Alternative 5 provides the most Habitat Units in their analysis, except for Alternative 6 which is infeasible because it would defeat flood control, the original project purpose (Draft EA dated August, 2006). The Corps selected alternative should be the one which gives the most Habitat Units per dollar and still maintains the function of the original flood control project. This likely would be Alternative 4 since hydraulic analysis had shown that Alternative 5 would cause substantial backwater effects that cannot be practically mitigated. The in-stream structures of Alternative 5 remain a future option, depending on actual performance (hydrological and biological) of the constructed project under Alternative 4.

Discussion and Justification of Fish and Wildlife Measures

1. Modifications that would mitigate adverse effects of the selected plan and/or other evaluated alternatives.

Excavation of the floodplain and construction of the sidestream wetlands in the selected plan (Alternative 4) would result in negative impacts due to removal of natural substrate/soil material, elimination of riparian vegetation and lowering of the water table. Nonetheless, these two features of the plan are desirable due to their opening up access for riverine aquatic life to habitats from which they are currently isolated by the concrete channel. Although substrates will be moved and removed, the water made available to a wider band of vegetation and soils, as well as the refugia provided by the series of sidestream wetlands, will improve the overall habitat availability in the area to a broader suite of species. Such evaluation species as bluegill will likely benefit from this plan in its creation of more suitable habitat as described in Terrell et al. (1982) in terms of improvement in the categories of the number of pools and eddies, wider stream size, more suitable aquatic vegetation cover and spawning substrate, and moderation of turbidity. Overall, this plan will convert one set of habitats—concrete or low-value urban weedfields of invasive plants—to wetter habitats supporting native plants and providing improved fish spawning/passage and urban recreation.

2. Unavoidable losses of the selected plan and/or other alternatives evaluated

The lost concrete river lining and excavation of streamside soils would be avoided in Alternative 1. This would mean that the concrete banks would remain in place and no riparian restoration would be initiated. Under this Alternative, the non-federal sponsor (Wayne County) or any of the other stakeholders would not have the authority to alter the current flood control project. Thus, unless a stakeholder were to obtain specific authorization to modify the project, none of the functions and values of the river system would be restored in the channelized reach. The harsh and intense negative impacts to the river system caused by the current flood control project would continue unmitigated. Impacts could be minimized if best management practices are applied to minimize erosion, sedimentation, pollutant inflow and ground disturbance while still accomplishing

the objectives of the Alternative. Replacing or providing substitute resources or environments would more than compensate for those lost. Under Alternative 4, the streamside wetland would have a largely increased habitat value, and the restoration and rehabilitation of these previously-altered habitats will compensate for the negative impact of the removal of concrete and fill areas.

3. The plan in which the trade-offs between fish and wildlife conservation and other project purposes are most consistent with the “equal consideration” provision of the FWCA.

The abundant medium to low value habitat that will be impacted by concrete and fill removal will be traded-off for gains in more acres and stream miles held in a higher resource mitigation category. This selected plan (Alternative 4) is the most consistent with the 1958 amendments to the FWCA which added provisions to require equal consideration of wildlife conservation with other water resources development programs.

This Alternative partially reverses the losses to Fish and Wildlife Resources from the building of the Flood Control project and improves the habitat for both resident and migrating species as well as recreational opportunities for humans. It also provides for the adaptive management and potential addition of the in-stream structures included in Alternative 5 as a no cost to the environment feature to be added later if hydrologic stability is proven to occur through future hydraulic modeling.

Recommendations

The Service recommends concrete removal as part of Alternative 4 (our basic position), with an adaptive management approach to adjust to changing circumstances. Such circumstances include the hydraulic consequences of Alternative 4's other features (floodplain construction and sidestream wetlands); if later hydraulic studies show that the backwater effect, if any, to be generated by the in-stream structures of Alternative 5 are compatible with the flood control project, then the Service would prefer to support that Alternative. Current understanding suggests Alternative 4 is likely to be the selected plan of the Corps.

Alternative 5 provided superior numbers of habitat units compared to Alternative 4. This alternative would also increase the habitat quality of the stream channel, the only alternative other than total concrete removal that improves stream channel bottom habitat.

The Service does not support Alternative 1 (No Federal Action) as it would provide no habitat improvement over the existing situation, which is sorely in need of correction in this stretch of the River Rouge.

This recommendation fits with many other habitat studies, such as the International Lake Ontario St. Lawrence River Study whose goals were to ensure that all types of native habitats (floodplain, forested and shrubby swamps, wet meadows, shallow and deep marshes, submerged vegetation, mud flats, open water and fast flowing water) and

shoreline features (barrier beaches, sand bars/dunes, gravel/cobble shores and islands) are represented in an abundance that allows for the maintenance of ecosystem resilience and integrity over all seasons; and to maintain hydraulic and spatial connectivity of habitats to ensure that fauna have temporal and spatial access to a sufficient surface of all the types of habitats they need to complete their life cycles (ILOSLSRB 2005).

The Corps and the non-federal sponsor (Wayne County, Michigan) are expected to accomplish necessary construction, and to initially share implementation and operation of the project, including any proposed conservation measures that may be included in the final project design. Once the project operates satisfactorily, the Corps will revert all responsibility for operation and maintenance to the non-federal sponsor. The Corps will remain at-hand for consultation to the non-federal sponsor regarding questions toward the function or performance of any aspect of the project, as designed and constructed. Maintenance of the constructed project, including the addition of any in-stream structures (if later determined to be hydrologically feasible) will become the non-federal sponsor's responsibility. For restoration and enhancement measures, cost-sharing provisions as established under the Federal Water Project Recreation Act, as amended (P.L. 89-72) and/or other authorities may also apply to this project.

Summary of Findings and FWS Position

The Service position supports concrete removal as part of Alternative 4 (our basic position), and management of the hydraulic consequences of Alternative 4's other features (floodplain construction and sidestream wetlands). If later hydraulic studies show that the backwater effect, if any, generated by the in-stream structures of Alternative 5 are compatible with the flood control project, then the Service would prefer to support that Alternative. This course of action is likely to be the selected plan of the Corps. The Service does not support Alternative 1 (No Federal Action) as it would provide no habitat improvement over the existing situation, which is sorely in need of correction in this stretch of the River Rouge.

If the Corps must change the set of Alternatives in the future, the Service asks to be included in developing revised recommendations and may change our report accordingly.

References:

- Beam, Jennifer D. and Jeffrey J. Braunscheidel. 1998. Rouge River Assessment. Michigan Dept. of Natural Resources, Fisheries Division, Special Report 22. Ann Arbor, Michigan.
- Flood Control Act of 1962. 1962. Public Law 87-874.
- Francis, J., Boase, J., Towns, G., and Hartig, J. 2006 Near-Shore Fish Community in Western Lake Erie. International Association of Great Lakes Research (Abstract) May 22, 2006 Windsor, ON.
http://www.iaglr.org/conference/2006/abstracts/pub_abstract_view.php?abstract_id=1136603457
- International Lake Ontario - St. Lawrence River Study Board. 2005. *International Lake Ontario - St. Lawrence River Study: Environmental Wetlands*
<http://www.losl.org/twg/environment-e.html>
- Knutilla, R. L. 1969. Technical Paper No. 1, Gazetteer of the river of River Rouge basin. United States Army Engineer District, Detroit, Corps of Engineers. Detroit, Michigan.
- Rouge River Bird Observatory, Environmental Interpretive Center, University of Michigan-Dearborn. 2006. Birds banded at Rouge River Bird Observatory: New birds banded since 1992. University of Michigan. 6/20/2006.
http://www.umd.umich.edu/dept/rouge_river/Specsumm.html.
- Scherega, J. 2007. Linking Science to Decision Making in the Great Lakes. Presentation at International Symposium: Climate Change in the Great Lakes Region: Decision Making Under Uncertainty March 15
- Terrell, J.W., T.E. McMahon, P. D. Inskip, R.F. Raleigh, and K.L. Williamson. 1982. Habitat suitability index models: Appendix A. Guidelines for riverine and acustrine applications of fish HSI models with the Habitat Evaluation Procedures. U.S. Dept., Int., Fish Wildl. Serv. FWS/OBS-82/10.A. 54 pp.
- USACE-LRE. 2003. Reconnaissance Level Study, Main Rouge River, Michigan Gateway Master Plan Evaluation.
- USACE-LRE. 2003. 1135 Preliminary Restoration Plan: Henry Ford Museum and Greenfield Village Oxbow - Dearborn, Michigan.
- USACE-LRE. 2004. 1135 Preliminary Restoration Plan: Rouge River Downstream of Rotunda Drive, to I-94, Wayne County, Michigan.

ATTACHMENT 3

USACE-LRE. 2004. 1135 Preliminary Restoration Plan: Rouge River Upstream of Rotunda Drive to Michigan Avenue, Wayne County, Michigan.

U.S. Army Corps of Engineers. 2006. Main Rouge River Upper/Lower Study-Section 1135 Wayne County, MI Hydrologic and Hydraulic Analysis. Prepared by the Detroit District .5 pp. + appendix.

U.S. Environmental Protection Agency. 2005. Rouge River Area of Concern. <http://www.epa.gov/grtlakes/aoc/rougriv.html>.