

**Delisting Targets for Fish/Wildlife Habitat and
Population Beneficial Use Impairments for the Clinton
River Area of Concern Addendum**



**Office of the Great Lakes
Great Lakes Management Unit
Michigan Department of Environmental Quality**

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Compiled by:

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Degradation of Fish and Wildlife Habitat and Populations and Degradation of Benthos Beneficial Use Impairments

Significance in the Clinton River Area of Concern

In the 1990's, Oakland County led the state in new construction, followed by Macomb County. Very rapid urban expansion and insufficient land use planning within the Clinton River watershed has led to degradation of fish and wildlife habitat and populations and degradation of benthos. Wetlands and other wildlife habitat have been almost entirely eliminated from the downstream portion of the basin, and natural drainage has been drastically altered throughout the watershed.

The geology of the area and the increasing amount of impervious surfaces has resulted in a variable stream flow within the Clinton River watershed. Low flows during dry periods and high flows that scour stream channels and banks during rainstorms have resulted in loss of fish habitat. In addition, seawalls, dredging, and draining have reduced or eliminated hydrologic connections between wetlands and their source of water, which has made it difficult to manage the hydrology of the river.

Based on the inextricable connection between habitat and populations, the Clinton River PAC (CRPAC) established local targets in 2009 for restoring the fish and wildlife BUIs, to be addressed as: Delisting Targets for Fish/Wildlife Habitat and Population Beneficial Use Impairments for the Clinton River Area of Concern 2009 (Clinton River AOC F/W Plan).

Restoration Criteria

The restoration criteria for fish and wildlife populations and habitat included the following delisting targets:

Degradation of Fish and Wildlife Populations

1. A healthy fish population is determined by the relevant resource management agencies to exist within the AOC at selected sites (to be determined cooperatively by the CRPAC, the Michigan Department of Environmental Quality (MDEQ), and the Michigan Department of Natural Resources (MDNR).
2. Relevant inventories, sightings, and observations made at selected sites lead to the determination that a diverse wildlife population exists within the AOC and that species that should be at those sites actually are at those sites.

Loss of Fish and Wildlife Habitat

1. Degradation of Benthos BUI is removed (contingent upon the removal of the Restrictions on Dredging BUI).
2. No water bodies within the AOC are included on the list of non-attaining waters due to low dissolved oxygen on the most recent Clean Water Act Integrated Report.

3. Additional habitat restoration remedial actions as outlined in the Clinton River AOC F/W Plan.

It was the intention of the Clinton River AOC F/W Plan technical committee that the targets be challenging yet not unrealistically attainable. It was recommended that the overarching targets be periodically reviewed and modified if it was determined that any of them were deemed impossible to reach. Further, the Clinton River AOC F/W Plan identified a number of high priority habitat restoration projects that, due to a lack of resources, did not have any detailed feasibility studies associated with them. As of 2010, the Clinton River AOC F/W Plan had not been formally approved by the MDEQ.

In order to better define the extent of the fish and wildlife populations and habitat impairments and degradation of benthos impairment, the CRPAC completed a Fish and Wildlife Population BUI Pre-Assessment in 2010 and a Degradation of Benthos BUI Pre-Assessment in 2011. During this process, existing fish, wildlife, and benthic data was analyzed to provide a rating for all of the sampled reaches within the watershed. Each segment was given a rating of excellent, acceptable, or poor based on a statistical analysis of the sampling data. All analyses were reviewed by a technical committee comprised of fisheries and biological experts. In addition, a review was completed by the MDEQ AOC Coordinator of the most current MDEQ and MDNR biological assessments of the Clinton River watershed to provide additional technical information.

Based on this work over a three-year period, the following reaches were identified as the most impaired within the AOC:

Location	Source	Conditions
Galloway Creek	1988 and 1995 RAPs, CRWC F/W and Benthic BUI Pre-Assessments, MDNR Clinton River Assessment 2006, MDEQ Biological Assessment 2009	Erosion, sedimentation, flashiness, poor fish scores
East Pond Creek	1988 and 1995 RAPs, MDEQ Biological Assessment 2009, CRWC F/W and Benthic BUI Pre-Assessments	Low DO, excess nutrients, poor fish scores
Big Beaver Creek	1988 and 1995 RAPs, MDNR Clinton River Assessment 2006, CRWC F/W and Benthic BUI Pre-Assessments	Poor fish scores, lack of habitat, not meeting WQS
Plumbrook Drain	1988 and 1995 RAPs, MDNR Clinton River Assessment 2006, CRWC F/W and Benthic BUI Pre-Assessments	Poor fish scores, lack of habitat, not meeting WQS

Gibson Drain	1988 and 1995 RAPs, MDNR Clinton River Assessment 2006, CRWC F/W and Benthic BUI Pre-Assessments	Poor fish scores, lack of habitat, not meeting WQS
Spencer Drain	1988 and 1995 RAPs, MDNR Clinton River Assessment 2006, CRWC F/W and Benthic BUI Pre-Assessments	Poor fish scores, lack of habitat, not meeting WQS
Red Run/Bear Creek	1988 and 1995 RAPs, CRWC F/W and Benthic BUI Pre-Assessments, MDNR Clinton River Assessment 2006, MDEQ Biological Assessment 2009	Poor fish scores, lack of habitat, erosion, sedimentation, flashiness, not meeting WQS
McBride Drain	CRWC F/W and Benthic BUI Pre-Assessments, MDEQ Biological Assessment 2009, CRPAC F/W Plan 2009	Poor benthic scores, marginal habitat
Gloede Drain	CRWC F/W and Benthic BUI Pre-Assessments, MDEQ Biological Assessment 2009	Poor benthic scores, marginal habitat
Miller Drain/Hart Drain	CRWC F/W and Benthic BUI Pre-Assessments, MDEQ Biological Assessment 2009, CRPAC F/W Plan 2009	Poor benthic scores, marginal habitat
Clinton River Main - Mt. Clemens	CRWC F/W and Benthic BUI Pre-Assessments	Poor fish scores, lack of habitat (seawall)
Clinton River Middle Branch	1988 and 1995 RAPs, MDNR Clinton River Assessment 2006, MDEQ Biological Assessment 2009	Erosion, sedimentation, flashiness, marginal habitat
Clinton River Spillway	1988 RAP	Sedimentation, characterized as eutrophic, marginal habitat

Building from the list of most impaired segments within the Clinton River AOC, it was determined that a habitat subcommittee or workgroup be convened to begin the process of establishing a list of habitat projects that would best address these areas and eventually lead to the removal of the fish and wildlife, as well as benthos, BUIs. Following an informative habitat workshop by EPA-GLNPO staff in early 2014, a habitat workgroup was created on a voluntary basis which included the following:

Jeff Bednar, Anderson, Eckstein, and Westrick
 Jamie Burton, Hubbell, Roth and Clark

Jim Francis, MDNR Fisheries
Jeremy Geist, CRWC Ecologist
Kevin Goodwin, MDEQ Biologist
Cleyo Harris, MDNR Fisheries
Shawn Keenan, City of Auburn Hills
Rob Myllyoja, Stantec
Lynne Seymour, Macomb County Public Works Office
Jen Tewkesbury, MDEQ Office of the Great Lakes
Randy Young, Macomb Community College
Rob Zbiciak, MDEQ Wetlands
Anne Vaara, CRWC PAC Fiduciary
Amanda Oparka, CRWC PAC Fiduciary

One of the first charges of the committee was a solicitation of potential habitat projects from all PAC members especially those that would address the identified impaired areas. A total of 34 potential projects were submitted for consideration by the habitat subcommittee. The projects were reviewed for a number of factors including progress towards fish and wildlife BUI removal, benthos BUI removal, feasibility, viability, and landowner cooperation among others. After an initial evaluation of the potential projects, additional information was requested of the project sponsors to include specific quantitative measures such as reduction in sediment loads, miles of connectivity, feet of in-stream habitat, etc. After this additional information was received, a formal review of the candidate projects was completed to create the final Clinton River AOC Habitat Project List.

Clinton River Area of Concern Habitat Restoration Projects Necessary for Removal of the Loss of Fish/Wildlife Habitat and Populations Beneficial Use Impairments

Project Title	Project Description	Subwatershed	Location	Aquatic and terrestrial habitat restored (acres)	Linear feet of channel restoration	Acres of wetland or floodplain restoration	Feet of in-stream habitat	Tons of sediment loading reduction	Est. Cost	Project Partners
1 Partridge Creek Commons Habitat Restoration - Gibson Renshaw Drains	Natural channel restoration of over one mile of Gloede Drain, five acres of contiguous and pocket wetland restoration, multiple acres of upland oak openings restoration, and over 50 acres of invasive species removal.	Clinton River East	Clinton Township	52	5500	5	5500	30	\$2,300,000	Clinton Township, Gloede Drain Drainage District, Clinton River Watershed Council, Six Rivers Regional Land Conservancy, Oakland University
2 Sylvan Glen Golf Course Restoration - Gibson Renshaw Drains	Restoration of natural meanders and riffle-pool bed topography, removal of two stream crossings, restoration of connectivity to adjacent wetlands and floodplain, and native plant revegetation.	Red Run	Troy	10	3500	3	3500	40	\$850,000	City of Troy, Clinton River Watershed Council, Red Run Watershed Advisory Group, Stakeholders
3 Galloway Creek Fish Passage Restoration	Improvement to this cold water trout fishery through the removal of fish barriers and the reconnection of two miles of in-stream habitat. Also includes the restoration of riffles and pools, improved stream channel stability, and invasive species removal.	Clinton Main	Rochester	1.15	1000	3	1000	65	\$1,400,000	Clinton River Watershed Council, OCWRC, Cities of Auburn Hills and Rochester
4 Clinton River Corridor Restoration	Restoration of stream banks and in-stream habitat, reduction in sediment loads, removal of large woody debris to improve flow and fish passage, and removal of terrestrial invasive species while establishing native vegetation throughout this nine mile stretch within the Clinton River corridor.	Clinton River East	Sterling Heights/Utica/Shelby Township	55	47520	N/A	47520	100	\$4,500,000	Cities of Sterling Heights and Utica, Clinton River Watershed Council, Macomb County Planning and Economic Development, Shelby Township
5 Clinton River Spillway Habitat Enhancement Phase II and Phase III	Creation of approximately two miles of off-channel spawning habitat, gravel substrate improvements, in-channel wood and aquatic vegetation, and establishment of native vegetation. Completed project will provide diverse fish spawning, rearing, and refuge habitats within the spillway and the Lake St. Clair estuary.	Clinton River East	Clinton Township/Harrison Township	1.5	9240	8.5	9240	40	\$8,000,000	Clinton River Watershed Council, Intercounty Drain Drainage Board, Clinton Township, Harrison Township, Mt. Clemens,
6 Wolcott Mill Metropark Wetland Restoration Project	Restoration of terrestrial and aquatic habitat within approximately 50 acres of wetland along the North Branch Clinton River through the removal of manmade drainage features and the reestablishment of pre-settlement native vegetation.	North Branch	Ray Township	60	N/A	60	N/A	N/A	335,000	Huron-Clinton Metro Park Authority, Macomb County, and the Clinton River Watershed Council
7 Shelby Township Stream Bank Stabilization	Restoration of approximately one mile of the natural river channel along four critical bends in the Clinton River through soft shore engineering, where appropriate, placement of structures for in-stream fish habitat, and the establishment of native vegetation.	Clinton River East	Shelby Township	6	5280	N/A	5280	30	\$600,000	Charter Township of Shelby, ASTI Environmental and Fazal Khan & Associates.
8 Plumbrook Drain	Four mile restoration of this deeply incised stream channel through natural channel design to reduce riffle embeddedness, pool filling, and channel widening. Other expected outcomes include water temperature reductions, reductions in sediment and nutrient loads, reduction of debris dams caused by channel instability, native vegetation reestablishment and overall floodplain connectivity.	Red Run	Sterling Heights	32	21200	N/A	21200	70	\$2,250,000	Clinton River Watershed Council, Drainage Board, City of Sterling Heights
9 Spencer Drain	Removal of two low head dams and two miles of restoration of this deeply incised stream channel through natural channel design to reduce riffle embeddedness, pool filling, and channel widening. Other expected outcomes include water temperature reductions, reductions in sediment and nutrient loads, reduction of debris dams caused by channel instability, native vegetation reestablishment, and overall floodplain connectivity.	Red Run	Troy	10	11000	N/A	N/A	70	\$3,500,000	Clinton River Watershed Council, OCWRC, MCPWO, City of Sterling Heights
10 Bear Creek Habitat Restoration	Approximately 1.7 mile restoration of this deeply incised stream channel through natural channel design to significantly improve channel stability, water temperature, and sediment and nutrient loads. Also includes removal of debris dams, native vegetation reestablishment, and overall improved floodplain connectivity.	Red Run	Warren	8.2	9000	N/A	9000	15	\$2,750,000	Clinton River Watershed Council, GM, MCPWO

Project Title	Project Description	Subwatershed	Location	Aquatic and terrestrial habitat restored (acres)	Lineal feet of channel restoration	Acres of wetland or floodplain restoration	Feet of in-stream habitat	Tons of sediment loading reduction	Est. Cost	Project Partners
11 Galloway Wetland Restoration	Removal of 5200 cubic yards of historical fill to expose underlying organic soils for the reestablishment of two acres of submerged and emergent wetland vegetation allowing for additional infiltration and reduced pollutant loads to Galloway Creek.	Clinton Main	Auburn Hills	2	N/A	2	N/A	N/A	\$145,000	Clinton River Watershed Council (CRWC) City of Auburn Hills, Oakland County Water Resources Commissioner (CCWRRC)
12 McBride Drain Restoration	Restoration of approximately four miles of stream channel through the installation of in-stream structures to create riffles and pools, restoration of native riparian corridor vegetation and restored connectivity to approximately 30 acres of adjacent wetlands. Anticipated outcomes include reduction in pollutant and sediment loads, improved fish habitat and improved bank stabilization.	North Branch	Macomb Township	45	20000	45	20000	50	\$2,500,000	Macomb Township; Anderson, Eckstein & Westrick, Inc.; Macomb County Public Works; Clinton River Watershed Council
13 Red Run Habitat Enhancement Master Plan	Creation of a comprehensive master plan to guide future restoration efforts within the Red Run Drain to include, but not limited to, green infrastructure, best management practices, and in-stream diam and tributary improvements	Red Run	Warren	N/A	N/A	N/A	N/A	N/A	\$1,200,000	Clinton River Watershed Council, local communities, Oakland County, Drainage Board
14 Big Beaver Creek Habitat Restoration	Approximately 1 mile restoration of this severely degraded stream channel through natural channel design to significantly improve channel stability, water temperature, and sediment and nutrient loads. Also includes removal of debris dams, native vegetation reestablishment, and overall improved floodplain connectivity.	Red Run	Warren	6.5	5280	N/A	5000	25	\$3,800,000	Clinton River Watershed Council, MCPWO, Drainage Board, City of Sterling Heights
USACE Projects Underway through Sec. 206 WRDA Funding										
Project Title	Subwatershed	Location	Est. Cost	Project Partners						
15 Harley Ensign Clinton River Mouth Coastal Wetland Restoration	Clinton River East	Harrison Township	\$2,000,000	SEMCOG, MNPR, Macomb County Planning Office						
16 Mainland Drain Restoration	Upper Clinton	Pontiac	\$2,970,756	Water Resources Commissioners Office Oakland County Facilities Management Oakland County Parks and Recreation Oakland County Planning and Economic						
17 Roseville Clinton Harrison Reller Drain Habitat Enhancement	Clinton River East	Clinton Township/ Harrison Township	\$2,350,000	Clinton Township, Harrison Township, SEMCOG, CRWC, Clinton River East Subwatershed Advisory Group, Roseville Clinton Harrison Relief Drain Drainage District						
			\$4,350,000							

Technical Review and Ranking of Projects Based on Value to Clinton River AOC Fish and Wildlife BUI Removal

MDEQ - Kevin Goodwin

MDNR - Cleyo Harris

Top Tier

Partridge Creek

Clinton River Corridor

Galloway Fish Passage

Spencer Drain

Clinton River Corridor

Galloway Fish Passage

Wolcott Mill

Shelby Twp Streambank

Galloway Wetland

Sylvan Glen

McBride Drain

Red Run Plan

2nd Tier

Red Run Plan

Galloway Wetland

Shelby Twp Streambank

Wolcott Mill

Clinton River Spillway

Partridge Creek

Sylvan Glen

Plumbrook Drain

3rd Tier

Plumbrook Drain

McBride Drain

Spencer Drain

Clinton River Spillway

Bear Creek

Bear Creek

Big Beaver

Big Beaver Creek

Outcomes and Quantitative Measures

Completion of the 14 Projects Necessary for the Loss of Fish/Wildlife Habitat and Populations BUI Removal would result in the following:

- **290 acres** of restored aquatic and terrestrial habitat
- **140,000 lineal feet** of channel restoration
- **127 acres** of wetland and/or floodplain restoration
- **128,000 feet** of restored in-stream habitat
- **2 miles** of restored fish passage and connectivity
- **Over 500 tons** of sediment loading reductions

Although the Clinton River AOC encompasses 760 square miles and over 81.5 miles of river in the Clinton River Main Branch alone, the selected projects have been designed to address those areas within the watershed that are the most degraded based on current and historical data. Restoring habitat within these targeted areas will improve the overall health of the entire watershed as well as Lake St. Clair. The anticipated investment to implement the 14 habitat projects equates to approximately \$44,907 per square mile of watershed and approximately \$22.75 per watershed resident with the estimate of 1.5 million residents, the most populous river basin in Michigan.

Finally, the 2014 Great Lakes Restoration Initiative Action Plan II has identified the Clinton River AOC as a target for the completion of all management actions and eventual delisting by the year 2018. Implementation of the 14 projects identified within this document, success of previously completed projects, and continued progress on the remaining BUIs within the AOC, will bring the Clinton River watershed significantly closer to that realization.

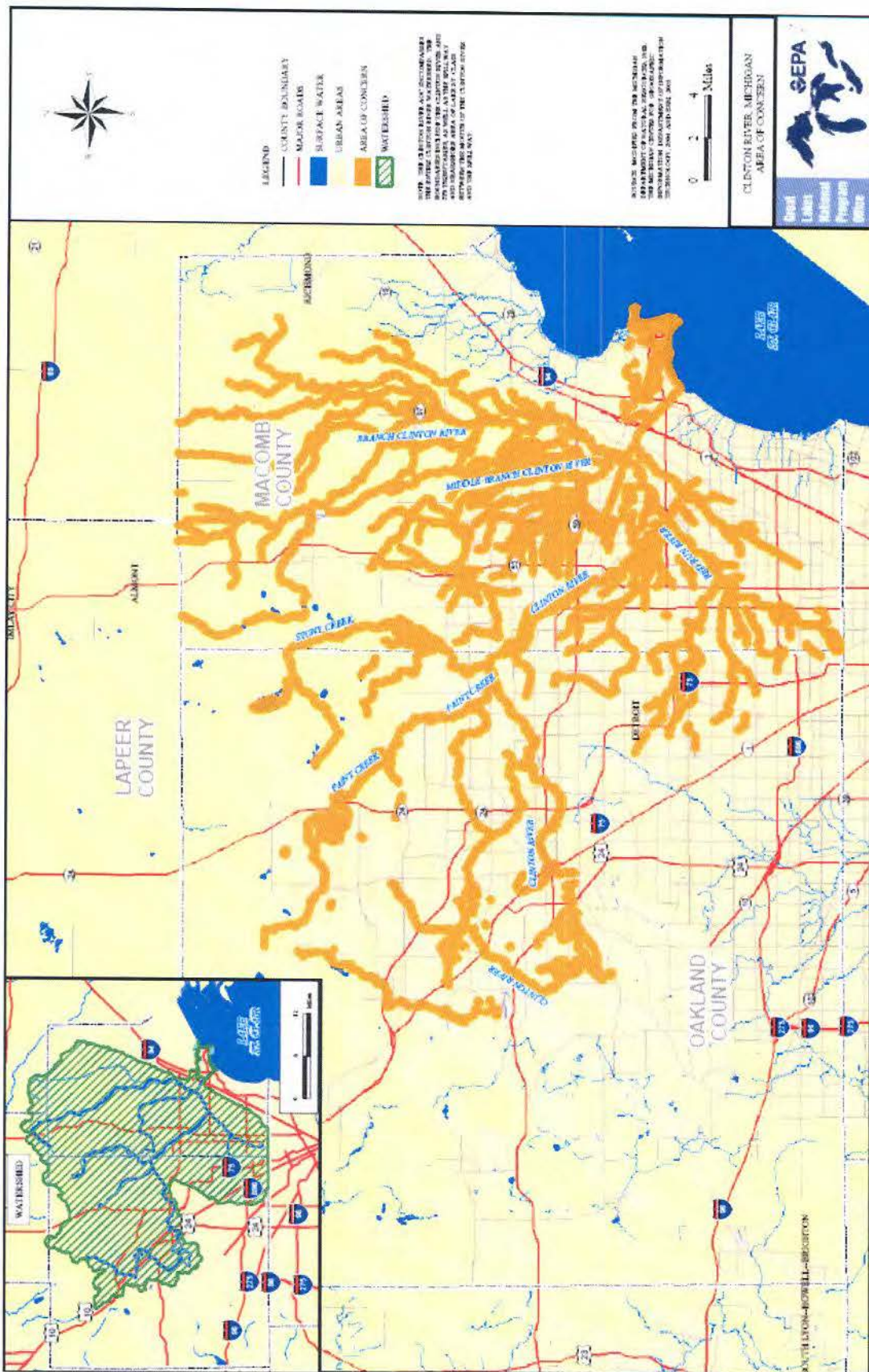
**Proposed EPA Funding of Clinton River AOC Habitat Projects Over 3 Years as
Approved by the Clinton River Public Advisory Council on January 27, 2015**

Partridge Creek Commons	\$	2,300,000	
Galloway Creek Fish Passage	\$	1,400,000	
Clinton River Corridor Restoration	\$	4,500,000	
Wolcott Mills Metropark Wetland	\$	335,000	
Galloway Wetland Restoration	\$	145,000	
Shelby Township Streambank Stabilization	\$	600,000	
Sylvan Glen Golf Course	\$	375,000	
Red Run Habitat Enhancement Master Plan	\$	2,000,000	
	\$	11,655,000	
Harley Ensign Clinton River Mouth Coastal Wetland Restoration (USACE Project)	\$	2,000,000	
	\$	13,655,000	
McBride Drain	\$	2,500,000	
Spencer Drain		*	
Clinton River Spillway Habitat Enhancement	\$	4,000,000	Includes current \$2.5 mil NOAA funding
Plumbrook Drain		*	
Bear Creek		*	
Big Beaver Creek		*	
Mainland Drain Restoration	\$	-	
Roseville Clinton Harrison Drain	\$	-	
	\$	20,155,000	

* - Project planning/design to be included in Red Run Habitat Enhancement Master Plan; no implementation funding

Completed Clinton River AOC Habitat Projects 2011-2014

Project	Project Lead	Location	Completion Date	Funding Source	Cost
Wolcott and Cascade Dam Removal	CRWC	North Branch	2011	USFWS and NFWF	\$ 226,570
Paint Creek Habitat Restoration Dam Removal	CRWC	Paint Creek	2012	EPA	\$ 732,806
Lake St. Clair Coastal Marsh Restoration	Macomb County Planning and Economic Development	Lake St. Clair	2013	EPA	\$ 1,492,500
Yates Park Streambank Stabilization	CRWC	Clinton River Main	2012	River Network	\$ 25,000
Avon Creek Restoration Phase I & II	City of Rochester Hills	Avon Creek	2012	USFWS GLBFHP NFWF SOGL and City of Rochester	\$ 373,500
Paint Creek Restoration Project	City of Rochester	Paint Creek	2014	City of Rochester	\$ 1,500,000
Restoring Fish Passage in the Red Run Headwaters	City of Troy	Red Run	2014	NOAA	\$ 1,600,000
North Branch Clinton River Cattle Bridge Removal Project	Macomb County Public Works Office	North Branch	2013	NFWF	\$ 57,500
North Branch Clinton River Wetland Restoration	Macomb County Public Works Office	North Branch	In progress	MDEQ	\$ 274,198
Clinton River Spillway and Fish Habitat Restoration Planning and Design	Macomb County Public Works Office	Clinton River Main	2011	NOAA	\$ 350,000
					\$ 6,632,074



Resources

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