Nine-Element Nonpoint Source Implementation Strategic Plan (NPS-IS plan) Howard Run-Blanchard River HUC-12 (04100008 03 04)

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Cover Photo Credit: Blanchard River (Martin)

Acknowledgements

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Acronyms and Abbreviations

The acronyms and abbreviations below are commonly used by organizations working to restore Ohio's watersheds and are found throughout this NPS-IS document.

Numbers	
319	Section 319 of the Clean Water Act
A	
ALU	Aquatic Life Use
B	
BMP	Best Management Practice
C	
CSA	Critical Sewage Area
CTIC	Conservation Tillage Information Center
D	
DAP	Domestic Action Plan
E	
ECBP	Eastern Corn Belt Plains
EQIP	Environmental Quality Incentives Program
F	
FLS	Federally Listed Species
G	
GLC	Great Lakes Commission
GLRI	Great Lakes Restoration Initiative
GLWQA	Great Lakes Water Quality Agreement
H	
H2Ohio	H2Ohio Initiative (Ohio state funding mechanism for water quality improvement)
HAB	Harmful Algal Bloom
HELP	Huron-Erie Lake Plains Ecoregion

HSTS	Home Sewage Treatment System
HUC	Hydrologic Unit Code
I	
IBI	Index of Biotic Integrity
ICI	Invertebrate Community Index
IJC	International Joint Commission
M	
MIwb	Modified Index of Well Being
MWH	Modified Warmwater Habitat
N	
NPDES	National Pollutant Discharge Elimination System
NPS	Nonpoint Source
NPS-IS	Nonpoint Source-Implementation Strategy
NRCS-USDA	Natural Resources Conservation Service-United States Department of Agriculture
O	
ODA	Ohio Department of Agriculture
ODNR	Ohio Department of Natural Resources
OEPA	Ohio Environmental Protection Agency
OLEC	Ohio Lake Erie Commission
OSUE	Ohio State Extension
P	
PAD-US	Protected Areas Database of the United States
Q	
QHEI	Qualitative Habitat Evaluation Index
R	
RM	River Mile
S	
STEPL	Spreadsheet Tool for Estimating Pollutant Loads
SWCD	Soil and Water Conservation District

T

TMACOG	Toledo Metropolitan Area Council of Governments
TMDL	Total Maximum Daily Load
TSD	Technical Support Document

U

USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

W

WAP	Watershed Action Plan
WLEB	Western Lake Erie Basin
WQS	Water Quality Standards (Ohio Administrative Code 3745-1)
WWH	Warmwater Habitat

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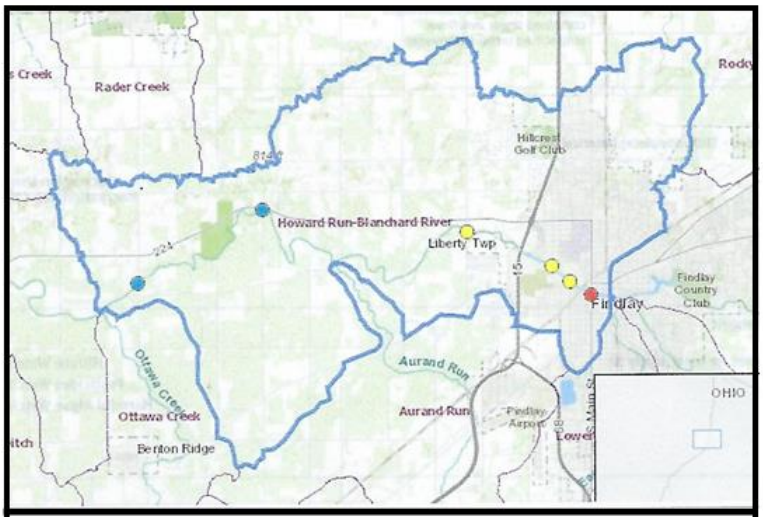
Chapter 1 Introduction

The **Howard Run-Blanchard River HUC-12** (04100008 03 04) watershed covers 23,094 acres or 36.08 square miles (Map 1.1). The primary land use in the watershed is for agriculture purposes. Agriculture land use involves roughly 14,345 acres or 62.12% of the watershed. Over 29% of the land use in the watershed involves land that has been developed. Picture 1.1 shows the mouth of Howard Run with the Blanchard River just east of the Broad Avenue Bridge.

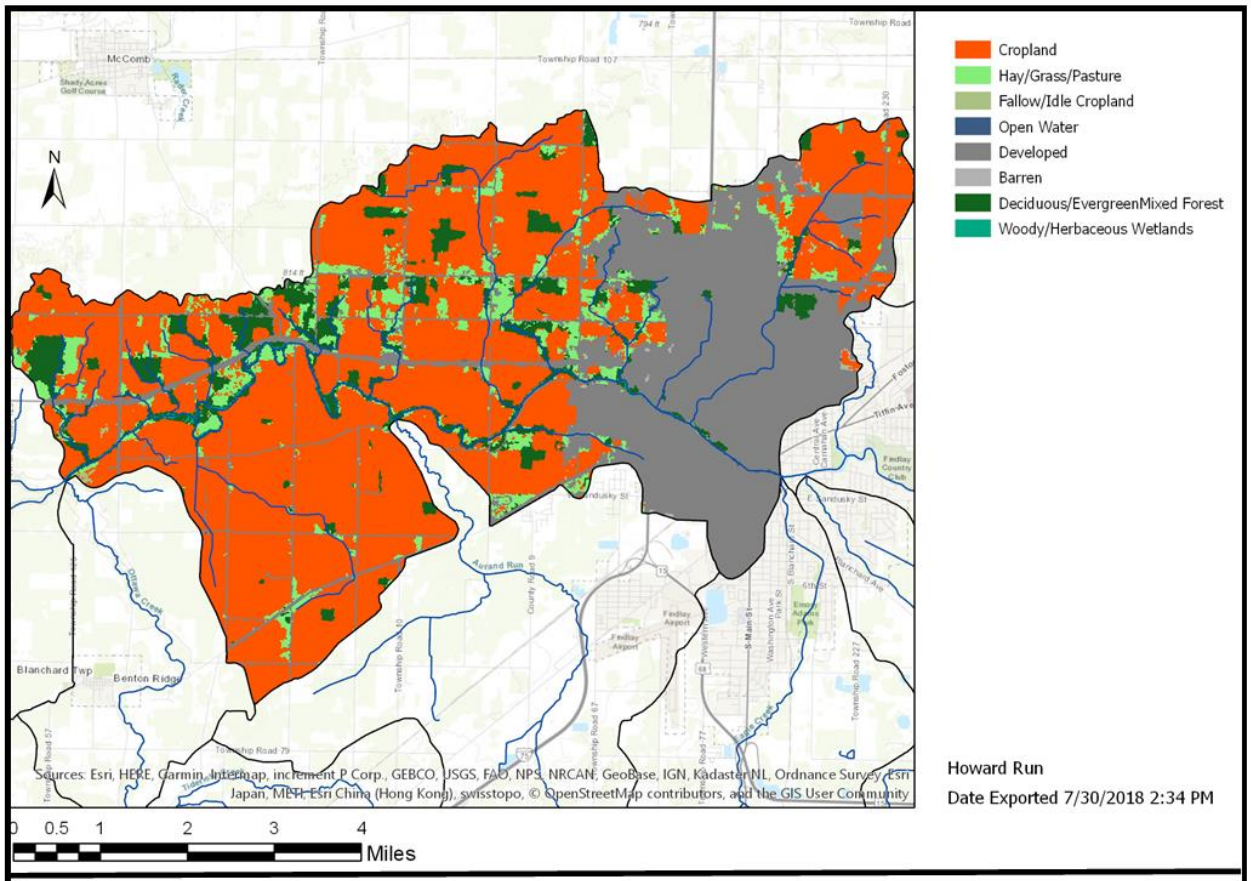


Map 1.1: Howard Run-Blanchard River Watershed (2018 OH Water Integrated Report)

The watershed starts (RM 58.10), where the Eagle Creek enters the Blanchard River. The Blanchard River flows west through the City of Findlay. The watershed ends at RM 45.6 west of Findlay near SR 235. Map 1.2, on the next page, shows the land use for the **Howard Run-Blanchard River HUC-12.** As shown on Map 1.2, most of the agriculture use is on the west side of the watershed. Most of the land use on the east side of the watershed involves developed land for the City of Findlay and surrounding urbanized area.

Picture 1.1: Mouth of Howard Run with the Blanchard River (Martin 2019)

Loadings from the Howard Run-Blanchard River HUC-12 not only have a near-field effect on the downstream portion of the Eagle Creek and Blanchard River, but also will have a far-field effect on Lake Erie, which is where the water finally flows.



Map 1.2: Land Use in the Howard Run-Blanchard River Watershed

There are several areas under the control of the Hancock Park District or the City of Findlay in the watershed that are used for recreation and conservation activities. (See Map 1.3 on page 4) Also there are two riffle dams located on the Blanchard River in this watershed these areas are:

A. ***Civitan Park*** - covers 3 acres on the north side of the river near downtown Findlay. The neighborhood park is a part of the Blanchard River Greenway Trail.
B. ***Anchor Park -*** covers about .05 acres on the south side of the river just west of the mouth of Eagle Creek.
C. ***Croy St. Riffle Dam*** - Removed during the summer of 2019.
D. ***Liberty St. Riffle Dam*** - Removed during the summer of 2019.
E. ***Great Karg Well Historic Site*** - The .5-acre park is the site of a historic monument honoring the Great Karg Well. The site is located on the south side of the Blanchard at the old Liberty Street dam. The park provides undeveloped access to the river for fishing.

Picture 1.2: The Great Karg Gas Well Historic Marker (Martin 2009)

F. ***Swale Park*** - Swale Park covers 65.6 acres and is located off Defiance Ave on the north side of the river. The park provides 4 ball diamonds and a wooded riparian area. The area along the river in Swale Park is being benched by the City of Findlay to help handle flooding. More details can be found on page 12.

G. ***Rawson Park*** - Two ball diamonds and a picnic area are in the park.

H. ***River Landings*** - River Landings is owned by the City of Findlay and managed by the Hancock Park District. The 10-acre park serves as the western terminus for the Blanchard River Greenway Trail. The mouth of Howard Run is in the park.

I. ***Findlay's Maple Grove Cemetery and St. Michael's Cemetery*** - The cemeteries are located off West Main Cross just east of I-75. The cemeteries cover approximately 86 acres.

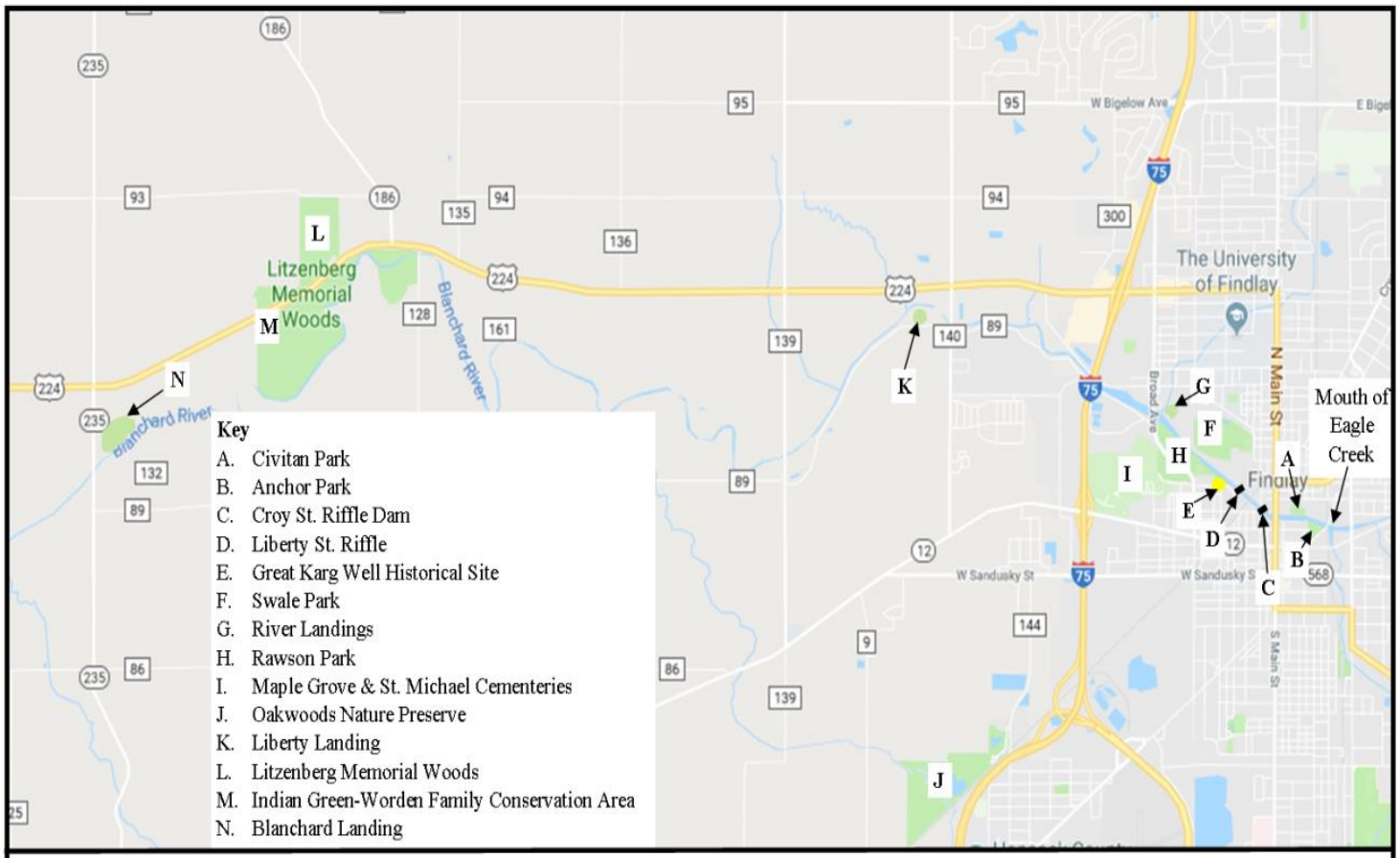
J. ***Oakwoods Nature Preserve*** - The 227.5 acres outdoor complex that contains diverse habitat, nature trails, and two lakes—all anchored by the Richard S. "Doc" Phillips Discovery Center. Wetlands, woodlands, and prairie create a place for discovery and form a natural attraction full of seasonal beauty that supports wildlife, environmental education, and nature-based outdoor recreation. The preserve is located on Oakwoods Lane off CR 144 west of Findlay.

K. ***Liberty Landing*** - This 2-acre park is located on TR 89 west of Findlay off CR 140 on the south side of the Blanchard River. This area provides a launch area for canoeists and kayakers and picnicking areas.

L. ***Litzenberg Memorial Woods –*** The park contains 227.7 acres on the north side and south side of U.S. Route 224 West. The land is characterized by rolling countryside, wooded ravines, and a grand expanse of wetlands, prairie, and sky. It blends the area's rich agricultural heritage with conservation and wildlife, education and history, hiking and exploration, picnicking and play, and social gatherings and special events to create a unique destination.

M. ***Indian Green - Worden Family Conservation Area*** - The 27.3 acres conservation area was created to afford access to a rare natural selection of the Heritage Trail, as well as to preserve the natural area along the Blanchard River.

N. ***Blanchard Landing -*** The landing marks the end of the 37.6-mile Blanchard River Water Trail. As a wayside destination, the 3-acre park offers relative isolation and solitude.



Map 1.3: Location of Parks and Conservation Areas, along with other key features in the Howard Run-Blanchard River Watershed

The federal and state nonpoint source funding opportunities require strategic watershed plans to be written at the HUC-12 watershed level using the nine essential elements in the *Guide to Developing Nonpoint Source Implementation Strategic Plans in Ohio* developed by the OEPA. The Blanchard River Watershed Partnership (BRWP), with collaboration from local agencies, has started to create Nine-Element Nonpoint Source Implementation Strategic Plans (NPS-IS plan) for the Blanchard River Watershed. The development of Nine Element Nonpoint Source Implementation Strategies (NPS-IS Plan) is vital to the efforts needed to meet the goal of Ohio's Domestic Action Plan (DAP) to reduce total spring loadings to Lake Erie by 40%, based on the 2008 loadings by 2025, The approved NPS-IS Plan will have both near-field (within stream/watershed) and far-field (Lake Erie) effects.

1.1 Report Background

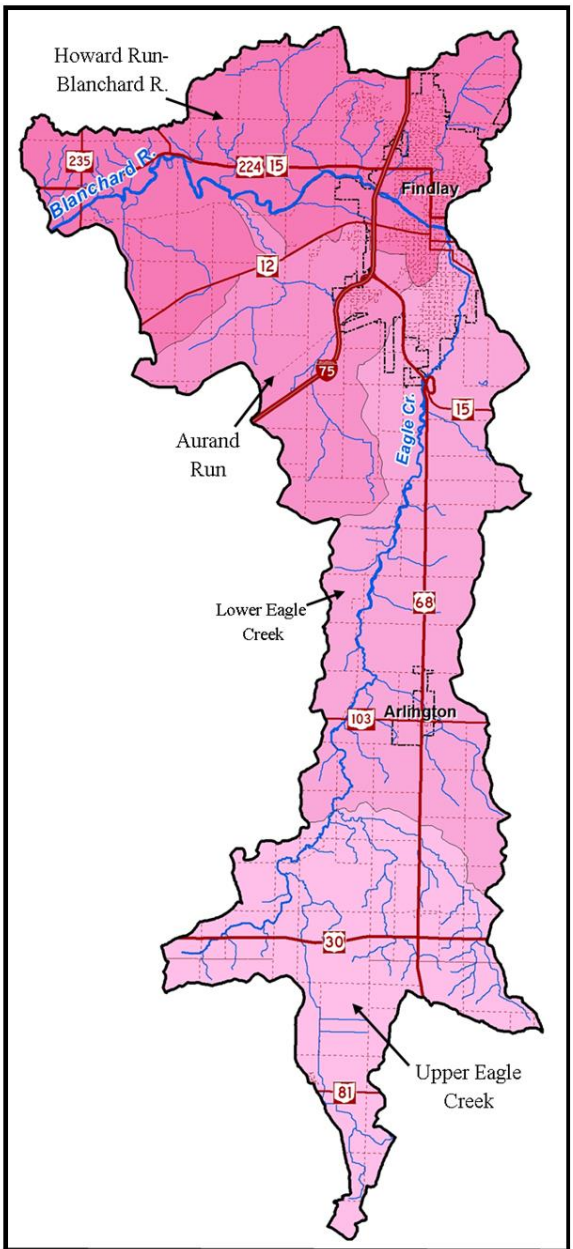
The Blanchard River Watershed Partnership is a community-based volunteer 501(c) (3) organization that seeks to address problems and concerns that affect the health of the Blanchard River Watershed and educate all citizens about the dynamics of the Blanchard River and its tributaries. The BRWP members and Board of Directors include interested citizens, local government agencies, educators, representatives of industry and other stakeholders who have come together with one goal in mind: to improve and maintain water quality within the watershed. One of the main ways to achieve improved water quality was through the development of watershed action plans (WAP). In June 2011, the BRWP received full approval of The Outlet/Lye Creek (HUC 04100008 02) WAP. In November 2012, the BRWP received full endorsement of another WAP for the Riley Creek Watershed (HUC 04100008 04). These two action plans were written at the HUC-10 level. Implementation activities in these two watersheds have been occurring since their endorsement. After the approval of these two WAPs, designed to outline the process for restoration activities, the BRWP was able to write or assist with grant writing that resulted in the award of over $11,000,000 in funding.

With the new requirement from the U.S. EPA to develop plans that align with the nine-element plans, the focus of the partnership is now on developing NPS-IS plans for individual HUC-12 based on their grade in the 2012 Report Card. This NPS-IS plan is being written for the **Howard Run-Blanchard River HUC-12 (04100008 02 05)** watershed to address nonpoint source causes and sources of impairments that have been specifically identified in the watershed.

Removal of nonpoint source impairments in the **Howard Run-Blanchard River HUC-12** will address nonpoint source impairment and allow for step wise improvement toward achieving attainment of water quality standards. In addition, nutrient load reductions achieved through implementation of projects in this watershed will address the goals to reduce far-field Western Lake Erie Basin load reduction goals as described in the Ohio Domestic Action Plan for Ohio in accordance with the Annex 4 agreement.

1.2 Watershed Profile & History

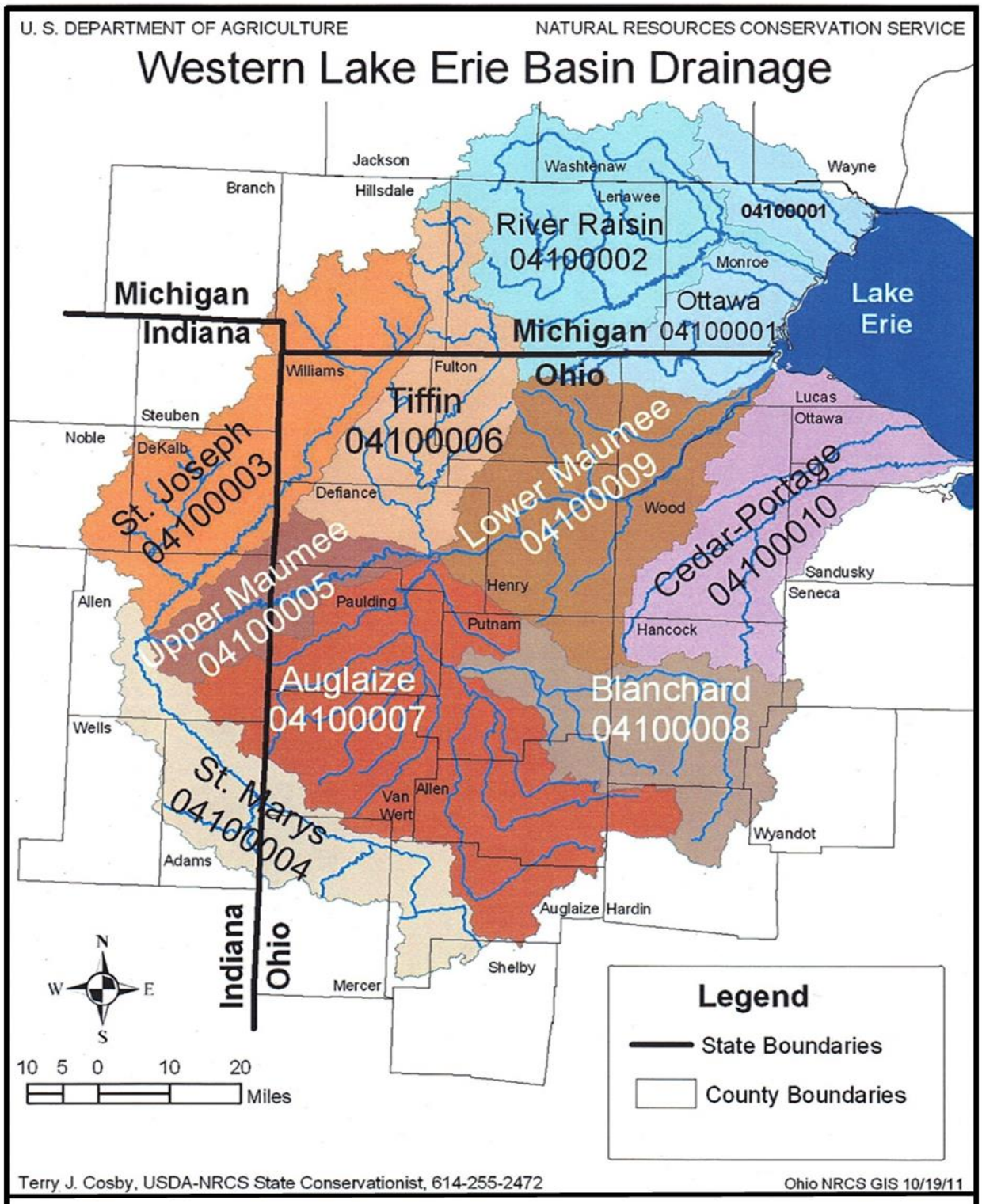
The Blanchard River Watershed is identified using an 8-digit Hydrological Unit Code (HUC), 04100008. There are six subwatersheds within the Blanchard River Watershed. Each of these subwatersheds is identified using a HUC-10. The Eagle Creek watershed HUC-10 is 04100008 03. There are four smaller HUC-12 watersheds located in the Eagle Creek watershed. Map 1.4 shows the HUC-10 subwatersheds in the Eagle Creek watershed. The Blanchard River Watershed covers 493,434-acres (771 square miles) and drains into the Auglaize River west of the Village of Dupont in Putnam County. From here, the water flows into the Maumee River at Defiance and eventually into Lake Erie at Toledo. Map 1.5 the next page shows the location of the Blanchard River Watershed in the Western Lake Erie Basin. Map 1.6 on page 8 shows the location of the **Howard Run-Blanchard River HUC-12 w**atershed in the Blanchard River Watershed.



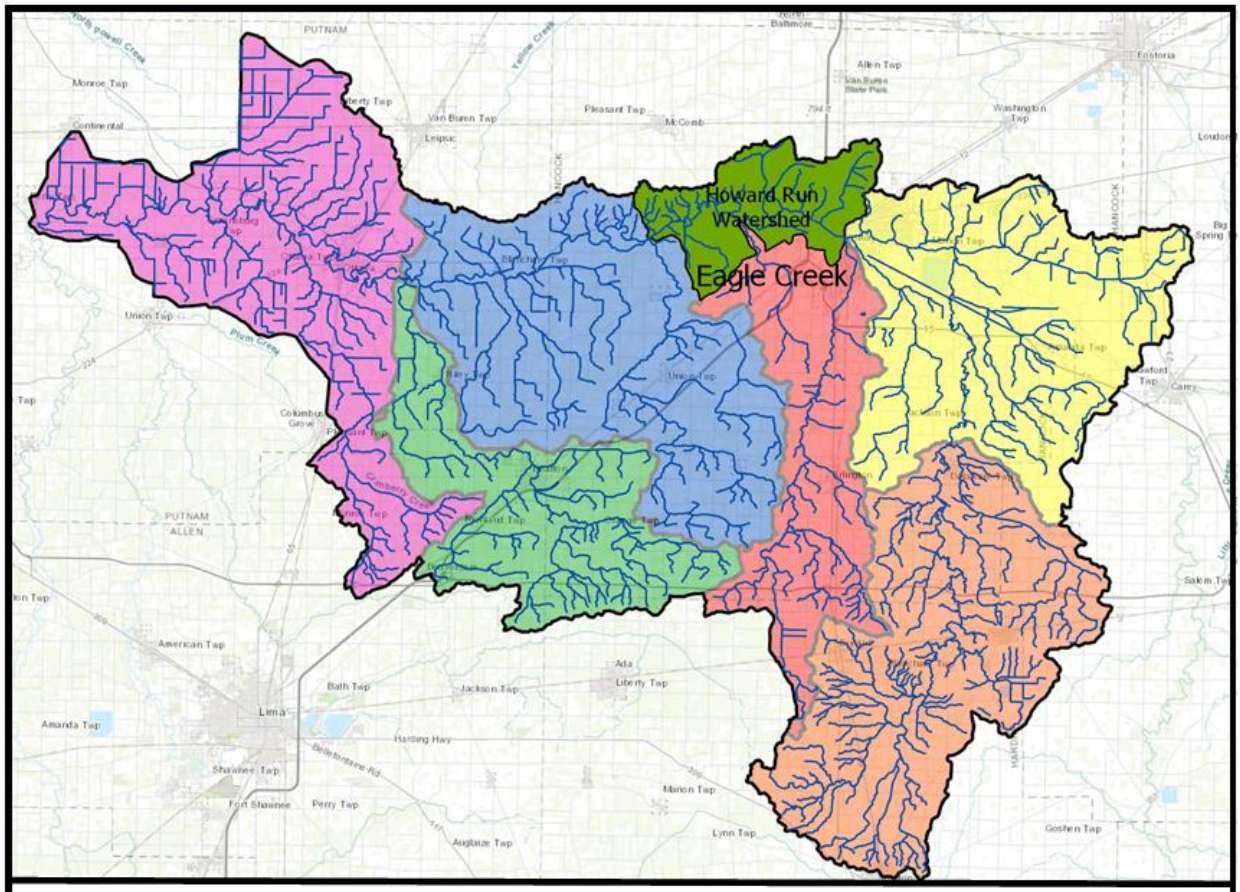
Map 1.4: Eagle Creek Watershed (HUC 04100008 03) with the HUC-12 subwatersheds

Before European immigrant settlement in the 1800s, wetlands were common and, based on soil survey information, made up about 42 percent of the watershed. Due to the clearing of swamp forest and the subsequent drainage of the land, most of the wetlands have been artificially drained. Wetlands, occurring in cropland, currently constitute less than 1 percent of the watershed and wooded wetlands constitute about 3.2 percent of the watershed.

In addition to addressing the impairments in the **Howard Run-Blanchard River HUC-12,** this NPS-IS plan will have a cross benefit to meet phosphorus load reduction goals in the Western Lake Erie Basin described in the Ohio Domestic Action Plan for Ohio.



Map 1.5: Location of the Blanchard River Watershed in the Western Lake Erie Basin



Map 1.6: Location of the Howard Run-Blanchard River Watershed in the Blanchard River Watershed (Reynolds)

1.3 Public Participation and Involvement

The initial planning process for developing a Nine-Element Nonpoint Source Implementation Strategic Plan (NPS-IS) was conducted by the Blanchard River Watershed Partnership (BRWP). Partners were contacted to inform them of the plan. The City of Findlay and Hancock County Commissioners provided input on what was being done by the Flood Mitigation Projects and what BMPs they might be willing to implement. The City of Findlay also provided an update on the CSOs that were mentioned in the TMDL. A meeting was held with HSWCD technicians to approve the BMPs used on the agricultural cropland. These recommendations for BMPs were based on what they felt farmers would be willing to use. Meetings were held with the University of Findlay and the Findlay City Schools to discuss and identify areas where the suggested BMPs would be useful.

The watershed was scouted by doing a road-by-road observation and inspection of the conditions of the waterways, agricultural fields, and other features that would be useful in developing the **Howard Run-Blanchard River HUC-12 NPS-IS** plan.

A meeting was held with the University of Findlay concerning issues with Howard Run flowing through the university's property, and potential surface pollution from run-off from the many parking lots. A similar meeting was held with the Findlay City Schools concerning the potential surface pollution from the five schools located in the watershed.

The City of Findlay experienced a 100-year flood in August 2007. The river corridor of the **Howard Run-Blanchard River HUC-12** Watershed runs through the downtown area of Findlay. The City of Findlay and the Hancock County Commissioners, along with several business leaders formed the Blanchard River Flood Mitigation, Inc. to gather data and work with the U.S. Army Corp of Engineers to develop a plan on how to handle the floods. The Army Corp of Engineers will only be involved in future projects, dealing with flood mitigation, if there is a need for a 404 and/or 401 permit. In 2016 the City of Findlay and the Hancock County Commissioners parted ways with the Army Corp of Engineers and asked the Maumee Watershed Conservancy District to take over the flood mitigation efforts. Mr. Steve Wilson, the former Hancock County Engineer, has been the project manager since the flood mitigation efforts started. Meetings were held with Mr. Wilson, and he provided his input based on what he had discussed with the Hancock County Commissioners, City of Findlay, and Maumee Watershed Conservancy.

Once the goals, objectives and project sheets for each Critical Area were completed, Chapters 3 and 4 were sent to the City of Findlay, Hancock County Commissioners, and the HSWCD. They were asked to review each part which applied to them and make any changes they thought were needed. A meeting was held with the University of Findlay and the Findlay City Schools to review the suggested BMPs that applied to them. The final modifications and suggestions comprised were included in the plan.

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Chapter 2: Howard Run-Blanchard River Watershed

Characterization and Assessment Summary

2.1 Summary of Watershed Characterization for the Howard Run-Blanchard River Watershed HUC-12

2.1.1 Physical and Natural Features

Picture 2.1: Dalzell Ditch - The mouth of Dalzell Ditch is located on the east side of I-75 on the north side of the Blanchard River (Martin 2019)

The **Howard Run-Blanchard River HUC-12** watershed starts at RM 58.10, where Eagle Creek empties into the Blanchard River. The river flows in a westerly direction to RM 45.6, where it enters the Village of Gilboa-Blanchard River watershed HUC-12 watershed. There are three main tributaries that flow into the Blanchard River in the watershed. The mouth of Howard Run starts at RM 57.11. Howard Run runs in a northeast direction for approximately 3.3 miles and drains urban and residential areas. Dalzell Ditch enters the river at RM 56.42. The ditch runs in a northeast direction and drains mainly commercial area. Dalzell Ditch is covered for the most part, except where it flows through Findlay High School. Oil Ditch enters the Blanchard River at RM 54.00 and runs in a southeast direction. The ditch gets its name from the fact that its head starts in the old refinery area of Findlay. There are three other tributaries that enter the river on the north side between RM 55.76 - RM 54.30. All three tributaries drain urban and farmland. The entire watershed covers about 36.08 square miles and drains 23,094 acres. Land use within the watershed includes development comprised of low to high-intensity development (29.2%) and land for agricultural purposes (62.2%). Table 2.1, on the next page, summarizes the land use in the watershed.

The Aurand Run HUC-12 watershed flows into the Blanchard River at RM 52.17. As a result, water from the Aurand Run HUC-12 watershed flows into the final 6.5 miles of the Blanchard River in the **Howard Run-Blanchard River HUC-12 Watershed.**

Most of the watershed lies within the Eastern Corn Belt Plains (ECBP), ecoregion. In an ECBP ecoregion there is a clay-enriched B horizon and the predominant land use is cropland. Additionally, the dominant forest type is the beech/maple forest and the primary land use is agriculture (Knowlton, OSU). Near RM 49.8 the watershed transitions from ECBP ecoregion to the Huron-Erie Lake Plains (HELP) ecoregion. A HELP ecoregion is characterized by a broad, fertile, nearly flat ***plain*** punctuated by relic sand dunes, beach ridges, and end moraines (USGS). Dalzell Ditch and Oil Ditch in the **Howard Run-Blanchard River HUC-12** are under

maintenance by the Hancock SWCD based on the Ohio Drainage Law petition and maintenance procedures.

Table 2.1: Land Use for the Howard Run-Blanchard River Watershed (04100008 03 04)			
Land Use Classification	**Area (ac.)**	**Area (mi^2)**	**% Watershed Area**
Crop Land	12,556	19.62	54.43
Hay/Pasture	1,789	2.80	7.75
Deciduous Forest	1,723	2.69	7.45
Fallow/Idle Cropland	49	0.08	0.21
Barren	46	0.08	0.21
Herbaceous Wetlands	119	0.18	0.52
Developed, High Intensity	689	1.08	2.96
Developed, Medium Intensity	1,398	2.18	6.03
Developed, Low Intensity	2,644	4.13	11.43
Developed, Open Space	2,019	3.15	8.74
Water	62	0.09	0.27
Total	**23,094**	**36.08**	**100.00**

2.1.2 Land Use and Protection

As shown in Table 2-1 above, 54.43% of the **Howard Run-Blanchard River HUC-12** is used for agricultural purposes. As with most of the agricultural area in the Blanchard River Watershed, corn and soybeans are the two dominant crops being grown (USDA 2015). There are 6,750 acres, or 29.16% of the watershed, being used for residential, retail, and manufacturing. There are five Findlay City School buildings located in the watershed. They are:

- Findlay High School and Millstream Career Center - located at 1200 Broad Ave just east of I-75 at the intersection with SR 224. The high school covers 63.3 acres. Dalzell Ditch flows through the property.
- Bigelow Intermediate School - located at 300 Hillcrest Ave., the school covers 7.8 acres in a residential area.
- Northview Primary School - located at 133 Lexington Ave., the school covers 3.5 acres in a residential area.
- Glenwood Middle School - located at 1715 N. Main St., the school covers 23.5 acres. Howard Run runs along the east side of the property.
- Jacobs Primary School - located on Jacobs Ave., east of Blanchard Street near the Trenton Ave. intersection. The school covers 10.6 acres in a residential acre.

The EPA's National Pollutant Discharge Elimination System (*NPDES*) requires a permit for all facilities discharging pollutants from a point source to a water of the state. There are two Individual Permits. In addition, there are eleven Industrial Storm Water Construction, Construction Storm Water, and MS4 General Permits listed on the Ohio EPA website. A table showing these permits can be found in the Appendix section at the end of this plan.

The main transportation corridor in the watershed includes I-75, which runs in a north-south direction on the west side of the City of Findlay. State Route 224 runs in an east-west direction leading from Findlay west towards Ottawa. State Route 12 runs from an east-west direction leading from Findlay to Pandora. The only railroad track runs in a north-side direction just west of the mouth of Eagle Creek in the watershed. These transportation corridors present areas of potential stormwater pollution from normal spills and droppings.

At one time, there was a low-head dam located at RM 57.41 on the Blanchard River in the watershed. According to the 2009 TMDL Report, the Liberty Street Dam created an impoundment above the dam that significantly impacted the fish and macroinvertebrate assemblages in the river. The impoundment also acted like a sink, collecting silt and pollutants from the area's CSOs and from storm water. The Liberty Street Dam was modified to a riffle dam after the 2007 flood. The Liberty Street dam was removed by the City of Findlay as part of a flood mitigation project in the fall of 2018 (See picture 2.2). The Ohio EPA in the TMDL Report stated, "The combined effect of removing both the Liberty Street and Riverside Park dams will very likely allow the river to attain WWH use designation."

Picture 2.2: Liberty Street Dam - The top picture shows the riffle dam that was installed in 2008. The bottom picture shows the area after the dam was removed during the summer of 2019. (Martin 2019)

2.2 Summary of Biological Trends for the Howard Run-Blanchard River HUC-12

The **Howard Run-Blanchard River HUC-12** was sampled starting in 2005 and reported in 2009 as a part of the Ohio EPA's the Total Maximum Daily Load Report (TMDL). The 2009 TMDL report was used extensively in preparation of the **Howard Run-Blanchard River HUC-12** NPS-IS Plan, in addition to the OEPA 2018 Ohio Integrated report. The OEPA Water Quality on Hydrological Units interactive map was also a great source of data and information for this report. The habitat and biological data presented in this plan are from these reports collectively. Table 2.2 shows the Biological Indices scores from the TMDL Study.

Site-specific evaluations of the Primary Contact Recreation use were conducted in the **Upper Eagle Creek HUC-12** in 2005. Evaluation of the Recreational Use Assessment reported a score of 0 due to impairment from bacteria (2018 WQR).

Table 2.2: Biological Indices Scores for Selected Sites in the Howard Run-Blanchard River HUC-12

Location	River Mile	Drainage Area (mi)	IBI	IBI Narr.	MIwb	Mlwb Narr,	ICI[b]	ICI Narr.	QHEI	Attainment Status
Blanchard River WWH										
Blanchard River at Findlay @Main St.	57.73	335.00	36	MG*	9.65	EX	12	Poor	46	NON
TR 66	1.0	6.6	---		a		F*		---	Non
Flat Branch west TR 66	0.05	10.9	26*		a		MG[ns]		54.0	Non

(Source: 2018 Integrated Water Quality Report)

NOTES
IBI Index of Biotic Integrity
a The Modified Index of Well Being (MIwb) is not applicable to headwater sites (drainage ≤20 mi2).
ICI Invertebrate Community Index
b Narrative evaluation used in lieu of ICI (G=Good; MG=Marginally Good; H Fair =High Fair; F=Fair; L Fair=Low Fair; P=Poor; VP=Very Poor). QHEI Qualitative Habitat Evaluation Index
** Significant departure from applicable biocriteria (>4 IBI or ICI units, or >0.5 MIwb units). Underlined scores are in the poor to very poor range.*
ns Nonsignificant departure from biocriteria (<4 IBI or ICI units, or <0.5 MIwb units).
--- No data available.

2.2.1 Sediment and Stream habitat

The 2005 TMDL Study reported sedimentation and siltation as one of the impairments. There were six sites in the watershed studied during the 2005 TMDL Study. Only the site at RM 57.8 had a characterization of the sediment done. Table 2.3 below shows the data from this study. The site was located on the Blanchard River below Eagle Creek to above Aurand Run.

Table 2.3: Characterization of the Sediment in the Howard Run-Blanchard River HUC-12

Stream or River	River Mile	QHEI Categories			Total Sediment Score	Deviation from target (percent)	Main Impairment category
		Substrate	Channel	Riparian			
Blanchard River (below Eagle Creek to above Aurand Run							
Blanchard River	**57.8**	**6.5**	**8.5**	**4**	**19**	**40.6**	**substrate**

2.2.2 Macroinvertebrates (Invertebrate Community Index [ICI])

According to the 2009 TMDL report, the macroinvertebrate community in the **Howard Run-Blanchard River HUC-12 watershed** reflects an impaired aquatic resource. Table 2.4 below summarizes the data collected during the 2005 TMDL study.

Table 2.4: Macroinvertebrate Results from the 2009 TMDL Report for the Howard Run-Blanchard River HUC-12

RM (Drain Area mi^2)	No. Qualitative Taxa	Total Taxa	ICI[b]	Quality EPT
RM 57.82 Blanchard River at Main St. (335)	28	39	12	3
RM 57.30 Blanchard River upstream Findlay WWTP, downstream Liberty St. dam (336)	41	51	24	9
RM 56.90 Blanchard River upstream Findlay WWTP (336)	28	46	16	5
RM 55.20 Blanchard River at CR 140 (346)	46	60	42	14
RM 49.80 Blanchard River at CR 128 (378)	38	63	46	14
RM 46.50 Blanchard River at State Route 235 (387)	35	60	44	11

b - A narrative evaluation of the qualitative sample-based attributes such as community composition, EPT, taxa richness, and number of sensitive taxa were used when quantitative data were not available or considered unreliable due to current velocities less than 0.3 fps flowing over artificial substrates.

Map 2.1: Map of Attainment Status for Aquatic Life Use

There were six sites studied during the 2005 TMDL Study. All sites were located on the Blanchard River. The two sites located the furthest upstream of Findlay were in full attainment for aquatic life use and were in the HELP ecoregion. Three of the remaining sites were in partial attainment and one site was in non-attainment for aquatic life use. Map 2.1 above shows the location and attainment status for the six sites.

2.2.3 Habitat (via Qualitative Habitat Evaluation Index [QHEI])

Table 2.5 on the next page summarizes the Aquatic Assessment score from the 2009 TMDL Report for the **Howard Run-Blanchard River HUC-12** watershed.

The Ohio EPA sampling teams collected data related to water quality and habitat characteristics during the 2005 study. As shown in Table 2.4 on page 15, none of the sites had a Quality EPT score that exceeded the threshold metric.

Table 2.5: Summary of Aquatic Assessment Score for the Howard Run-Blanchard River HUC-12 Watershed (04100008 03 04)							
RM (Drain Area mi²)	**IBI**	**Mlwb[a]**	**ICI[b]**	**Status[c]**	**QHEI**	**Causes**	**Sources**
WWH - ECBP Ecoregion							
RM 57.80 Blanchard River at Main St. (335)	36*	9.7	12*	NON	46	Thermal modification, organic enrichment/DO, development related to direct habitat alteration, siltation	Dam construction, urban runoff, CSOs
RM 57.30 Blanchard River upstream Findlay WWTP downstream Liberty St. dam (336)	42	10.1	24*	Partial	63.0	Thermal modification, organic enrichment/DO, nutrients	Upstream impoundment, urban runoff, CSO
RM 56.90 Blanchard River upstream Findlay WWTP (336)	38[ns]	9.3	16*	Partial	56.5	Thermal modification, nutrients, development related direct habitat alteration	Upstream impoundment, urban runoff, channelization, CSO
RM 55.20 Blanchard River at CR 140 (346)	36*	7.6*	16*	Partial	54.5	Thermal modification, nutrients, organic enrichment/DO	Upstream impoundment, major municipal source (Findlay)
WWH - HELP Ecoregion							
RM 49.80 Blanchard River at CR 128 (378)	38	9.7	46	Full	61.5		
RM 46.50 Blanchard River at State Route 235 (387)	39	9.7	44	Full	65.5		

a - Mlwb is applicable to headwater streams with drainage areas ≤20 mi²
b - A narrative evaluation of the qualitative sample based on attributes such as community composition, EPT taxa richness and number of sensitive taxa were used when quantitative data were not available or considered unreliable due to current velocities less than 0.3fps flowing over artificial substrates.
c - Attainment status based on a single organism group is parenthetically expressed.
ns - Nonsignificant departure from biocriteria (≤4 IBI or ICI units, or ≤0.5 Mlwb units). Underlined scores are in Poor or Very Poor Range

2.2.4 Fishes (Modified Index of Well-Being [Mlwb] & Index of Biotic Integrity [IBI])

Table 2.6: Summary of Fish Population for the Howard Run-Blanchard River HUC-12 Watershed (04100008 03 04)

RM (Drain Area mi^2)	RM	Number Species	Tolerance to Pollution by Species*				
			T	MT	M	MI	I
Blanchard River at Main St. (335)	57.8	21	7	11	2	3	0
Blanchard River upstream Findlay WWTP downstream Liberty St. dam (336)	57.30	29	8	8	7	6	0
Blanchard River downstream Findlay WWTP (336)	56.80	19	6	5	4	4	0
Blanchard River west of CR 140 (346)	54.70	24	6	5	7	5	1
Blanchard River at CR 128 (378)	49.80	24	6	6	7	5	1
Blanchard River at State Route 235 (387)	46.50	31	8	8	10	4	1

*T - Tolerant; MT - Moderately Tolerant; M - Moderate; MI - Moderately Intolerant; I - Intolerant

The fish population study was conducted at six sites on the Blanchard River in the **Howard Run-Blanchard River HUC-12** watershed during July and October of 2005 as a part of the TMDL Study. Table 2.6 above summarizes the results of the study based on their tolerance to pollution. The data shows that at each site, the largest percent of species were either tolerant or moderately tolerant to pollution.

The TMDL noted that the impoundment formed behind the Liberty Street Dam had a significant impact on fish assemblages in the Blanchard River. The river experiences fluctuations in water temperature and dissolved oxygen. The report noted that pollutants from area CSOs and stormwater runoff affects the water quality of the river. As a result, the fish community conditions were rated as fair. Overall, the fish sampling results met ecoregional expectation. The 2018 Ohio EPA Integrated Water Quality Report reported that the fish tissue showed evidence of PCBs in the tissue.

NOTE: As discussed earlier, the Liberty Street Dam was removed in 2018-19, but no study of the fish population has been conducted since the dam was removed.

2.3 Summary of NPS Pollution Causes and Associate Sources for the Howard Run-Blanchard River HUC-12

Table 2.2 on page 14 provides a summary of the IBI, ICI, Mlwb, status of the site, QHEI, causes, and sources of Impairments at each site during the 2005 TMDL study. The 2018 Integrated Water Quality Monitoring and Assessment Report published by the Ohio EPA reported that the aquatic life use impairments in the **Howard Run-Blanchard River HUC-12** were temperature (water), nutrient/eutrophication biological indicators, nitrate/nitrite, sedimentation/siltation, direct habitat alteration and organic enrichment (sewage) biological indicators. The listed sources for the impairments were upstream impoundments, dams or impoundments, municipal point source discharge, combined sewer overflows, and unspecified urban stormwater. The watershed was designated as WWH. The two sites furthest downstream were in full attainment while the other four sites were in partial or non-attainment status.

The OEPA has estimated spring phosphorus loadings from individual subwatersheds throughout the greater WLEB watershed. These estimates also include a breakdown of estimated loads from contributing sources of NPS pollutants, such as agricultural lands/activities, developed/urban lands, natural sources, and failing HSTS (Table 2.7). Efforts to reduce nutrients from each of these contributing sources will focus on reaching the 40% reduction goal outlined by Annex 4 of the GLWQA and the Ohio DAP.

Table 2.7: Estimated Spring Nutrient Loadings from Contributing NPS Sources in the Howard Run-Blanchard River HUC-12

	Agricultural Load (lbs)	Developed/Urban Load (lbs)	Natural Load (lbs)	HSTS Load (lbs)	NPS Total (lbs)
Current Estimates*	12,000	2,800	160	450	15,000
Target Estimates*	7,200	1,650	96	270	9,000
(Source: OEPA) **Estimated using two significant figures*					

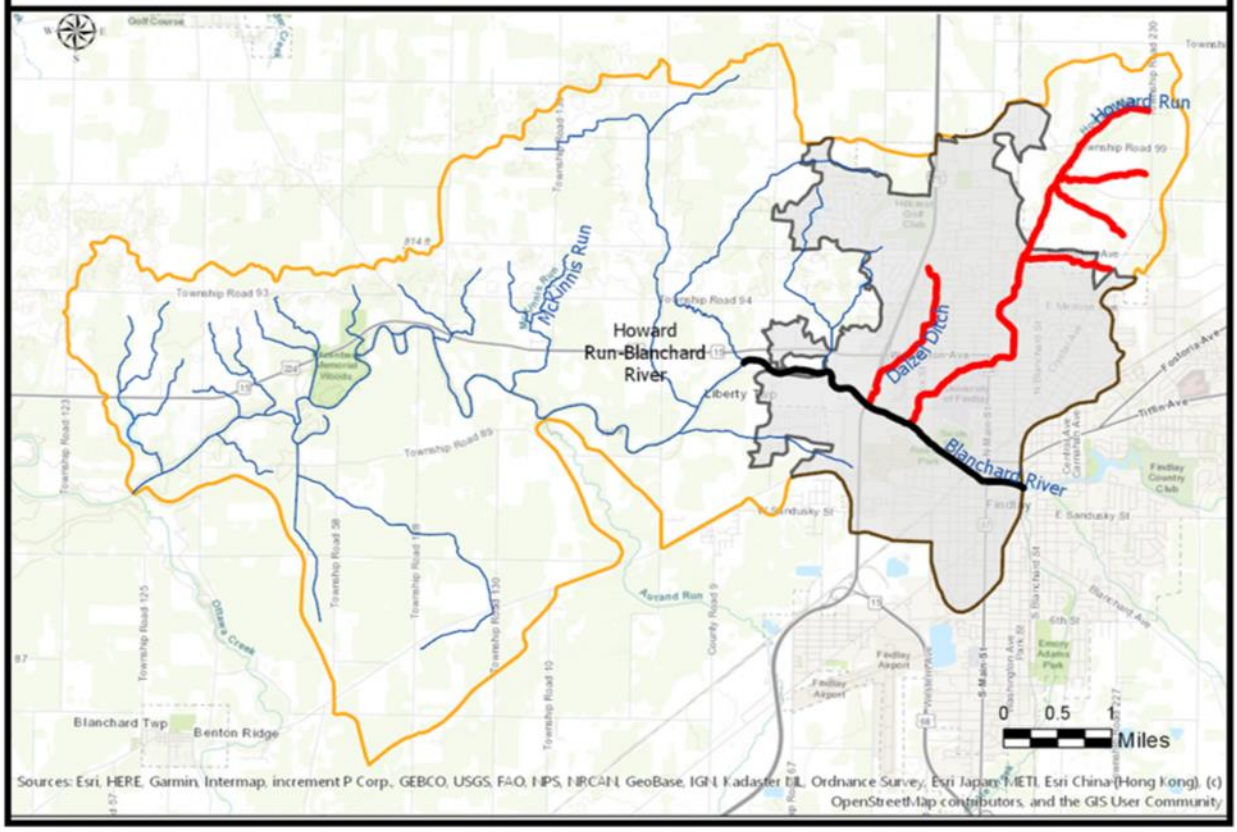
The TMDL report indicates that Recreational Use Attainment in the watershed is impaired due to bacteria. There is no water being used as a water supply in the watershed.

Chapter 3: Conditions & Restoration Strategies for the Howard Run-Blanchard River HUC-12 Critical Areas

3.1 Overview of Critical Areas

According to the 2019 TMDL Report, the impairments in the **Howard Run-Blanchard River HUC-12** ***are related to urban activities and crop production with subsurface drainage.*** Section 10.3.4 of the U.S EPA' s 2008, *Handbook for Developing Watershed Plans to Restore and Protect Our Water,* states that, "In general, management practices are implemented immediately adjacent to the waterbody or upland to address the source pollutant loads." Using this rationale, Critical Area 1 will include the area of the floodplain along the main stem of the Blanchard River in the City of Findlay, Howard Run and Dalzell Ditch. Map 3.1 below shows the location of Critical Area 1 with the priority areas. Howard Run and Dalzell Ditch both have a well-established canopy, and both flow mainly through residential areas. The canopy over Dalzell Ditch disappears when the ditch runs through the Findlay High School property on the north side. For the most part, the Blanchard River has tree-lined banks along the main stem.

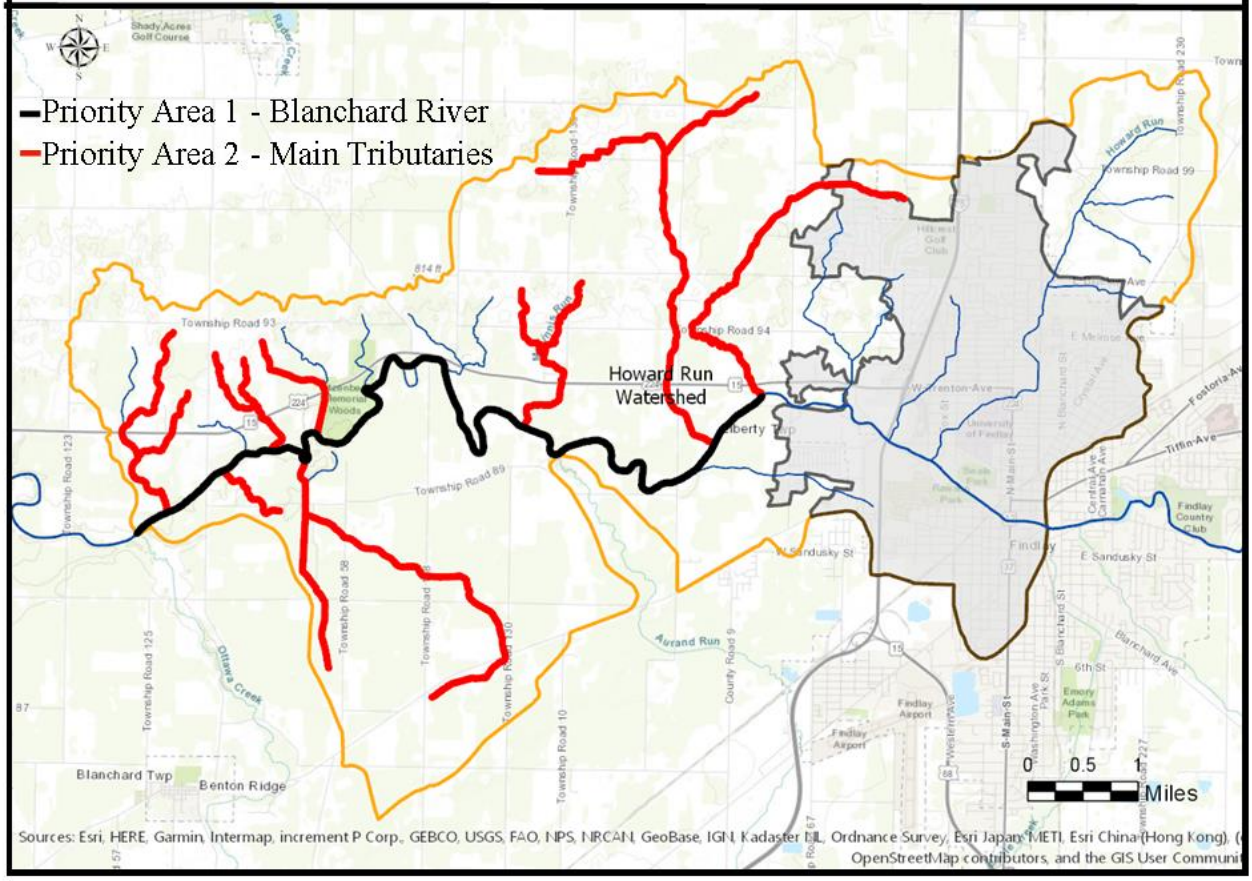
Map 3.1: Critical Area 1—Urban Area in the City of Findlay
Critical Area 1 includes the flood plain on the Blanchard River, Howard Run, and Dalzell Ditch



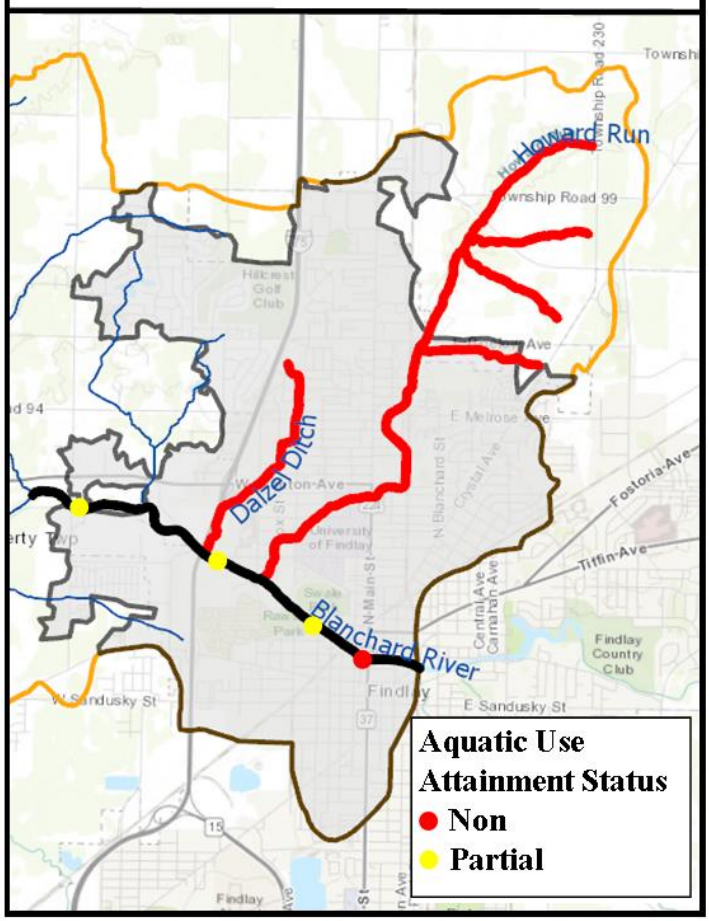
Critical Area 2 will include the agriculture (cropland) area located mainly west of Findlay. Priority Area 1 will include cropland located adjacent to the Blanchard River or flow directly into the river. Priority Area 2 will include the cropland adjacent to any tributary that flows directly into the Blanchard River. Map 3.2 shows Critical Area 2 with priority areas.

According to the 2009 TMDL Report, "excessive phosphorus and nitrates were observed in Eagle Creek and the Blanchard River, especially during high flow. Load reductions are needed from both agriculture and urban runoff during the spring and fall." Table 2.7 on page 19 shows the estimated phosphorus loading during the spring for the **Howard Run-Blanchard River HUC-12.** The table also shows the 40% reduction goal based on the Domestic Action Plan Report.

Map 3.2: Priority Areas in Critical Area 2



Map 3.3: TMDL Sites in Critical Area 1 - Urban Area in the City of Findlay.



3.2 Critical Area 1: Conditions, goals and objectives for the Howard Run-Blanchard River HUC-12 Watershed

3.2.1 Detailed Characterization

Critical Area 1 will focus on addressing impairments identified in the 2009 TMDL Report along the main stem of the Blanchard River in Findlay, Howard Run, and Dalzell Ditch. Map 3.1 on page 20 shows this area. The priority area will include the riparian buffer and flood plain areas. This area in the Blanchard River starts at the mouth of Eagle Creek (RM 58.10) and ends at RM 55.76.

Using the rationale described in the U.S EPA, 2008, *Handbook for Developing Watershed Plans to Restore and Protect Our Waters,* (Section 10.3.4): "In general, management practices are implemented immediately adjacent to the waterbody or upland to address the sources of pollutant loads."

3.2.2 Detailed Biological Conditions

There were four sites studied during the 2005 TMDL Study in Critical Area 1. Map 3.3 on page 22 shows the location of these sites.

Fish Community data is summarized in Table 3.2 below for Critical Area 1. The data shows the abundance, diversity, and pollution tolerance of existing fish species found by the Ohio EPA at these four sites in relationship to QHEI scores. Overall, Critical Area 1 is partially achieving attainment status at three of the four sites, and non-attainment at the fourth site. The Index of Biotic Integrity (IBI) has a goal of 40 in Warmwater Habitats. Three of the sites studied in Critical Area 1 had a range of 36 - 38. The other site at RM 57.30 had a score of 42, which is above the goal of 40.

Table 3.2: Fish Community Summarized for Critical Area 1

Stream/RM	D. A. (mi^2)	Total Species	QHEI	Mlwb	IBI	Predominant Species (percent of catch)	Narrative Evaluation
Blanchard River at Main St. (57.80)	335	21	46.0	9.6	36*	Gizzard Shad (22.5%) and Bluegill Sunfish (17.7%)	Good
Blanchard River upstream Findlay WWTP downstream Liberty St. dam (57.30)	336	336	63	10.1	42	Bluegill Sunfish (23.5%) Golden Redhorse (2.3%) Spotted Sucker (7.4%)	Good
Blanchard River downstream Findlay WWTP (54.80)	336	19	56.5	9.3	38^{ns}	Golden Redhorse (24.5%) Bluegill Sunfish (13.4%)	Good
Blanchard River west of CR 140 (54.70)	346	24	54.5	7.6*	36*	Spotfin Shiner (25.3%) Bluntnose Minnow (22.7%) Rock Bass (16.9%)	Good

* - Significant departure from ecoregion biocriterion; poor and very poor results are underlined.
ns - Nonsignificant departure from biocriterion (≤ 4 IBI or ICI units; ≤ 0.5 Mlwb units).

Characteristics of the aquatic macroinvertebrate community at the four sites in Critical Area 1 are summarized below in Table 3.3. Analysis of the abundance, diversity, and pollution tolerance of existing aquatic macroinvertebrates found by the Ohio EPA at the four sampling sites related to QHEI scores can help in the identification of causes and sources of impairment. Only one of the four sites w very good. The other three sites were fair - poor.

Table 3.3: Macroinvertebrate Community Data for Critical Area 1

Stream/RM	ICI Score - Narrative	Quality EPT	Predominant Species
Blanchard River at Main St. (57.80)	12 - Poor 2 sensitive taxa	3	Midges (T, F)
Blanchard River upstream Findlay WWTP downstream Liberty St. dam (57.30)	24 - Fair 2 sensitive taxa	9	Midges (T, F)
Blanchard River upstream Findlay WWTP (56.90)	16 - Low Fair	5	Midges (T, F)
Blanchard River west of CR 140 (55.20)	42 - very good 13 sensitive taxa	14	Caddisflies (VT, T)

Tolerance categories: VT=Very Tolerant, T=Tolerant, MT=Moderately Tolerant, F=Facultative, Mi-Moderately Intolerant, I=Intolerant

3.2.3 Detailed Causes and Associated Sources

The sampling sites in Critical Area 1 are in Non or Partial Attainment of the Warmwater Habitat aquatic life use designation. Table 3.4 below summarizes the causes and the associated sources of impairments presented in the 2009 TMDL Report for Critical Area 1.

Table 3.4: Causes and Sources of Impairments in Critical Area 1

Causes of Impairments	Sources of Impairment
Nutrient loadings [P (far-field) & N (near-field] Water temperature Nutrient / eutrophication Biological indicators Sedimentation / siltation Direct habitat alteration Organic enrichment (sewage) Biological indicators	Urban runoff, CSOs and agriculture Dam or impoundment Dams, impoundments and flow alteration Municipal point source discharge Urban runoff and agriculture Unspecified urban stormwater CSOs

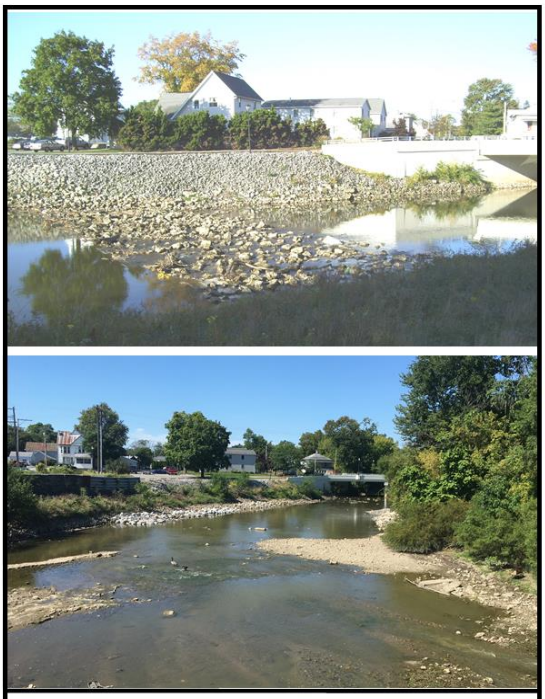
Before any Best Management Practices to achieve full attainment can be discussed, an update of the activities that have occurred in Critical Area 1 since the 2009 TMDL Report is needed. The watershed experienced a 100-year flood event in August 2007. As a result of the flood, the Hancock County Commissioners and the City of Findlay formed a task force to address the flooding issue, which in turn, resulted in changes to the main stem of the Blanchard River. Presently, the flood mitigation projects are being completed under the control of the Maumee Watershed Conservancy District.

The major projects that have been completed or are in progress are:

A. **Brandman Tire Dump** - The 2009TMDL Report noted that this location was directly polluting the Blanchard River. Clean-up efforts resulted in 300 tons of buried tires being removed and recycled. In addition, about 2,000 cubic yards of sediment containing lead have been removed and properly disposed at the Hancock County Landfill. Finally, 75,000 cubic yards of material was removed as a part of the "benching" project being done to restore the natural flow of the river channel.
B. **Low head dams/impoundments** - The 2009 TMDL Report called for the removal of the impoundments in the river that were causing most of the aquatic use problems. The low-head dam and riffle dams have been removed or modified at Liberty Street and Cory Street. Picture 3.1 and 3.2 on the next page show the Liberty Street and Cory Street riffle dam after removal/modification.
C. **Streambank Restoration -** Earlier work done on the Blanchard River between Cory St. and Broad Ave. resulted in a "pinch point" being created. This "pinch point" has resulted in increased sedimentation/siltation and flow alterations that have affected the aquatic life use in the area. The Maumee Conservancy Watershed District, City of Findlay and Hancock County Commissioners agreed to the recommendation from the Stantec Flood Study to remove the "pinch point" by widening the river, adding benches to help the aquatic habitat in the main channel, and provide an area for absorption of nutrients. The project was completed by the end of 2019.

In addition to the flood mitigation projects, nearly 1,000 acres of mainly farm ground has been developed into industrial sites since the TMDL Report. All of this land has been developed under the guidelines of the Ohio EPA Stormwater Phase II program. This program requires that all sites meet the requirements of their NPDES permit to prevent pollutants from reaching the river.

Picture 3.1: Site where Liberty Street Riffle Dam (RM 54.71) was located. Removal occurred during the summer of 2019. (Martin 2019)



Picture 3.2: Site where the Cory St. Riffle Dam (RM 54.96), looking downstream, was located. Removal occurred in the summer of 2019.

3.2.4 Outline Goals and Objectives for Critical Area 1

After reviewing Table 3.4 on page 24, and the update on activities conducted since the 2009 TMDL Report which are presented on page 25, the only source of impairment left that needs to be addressed in Critical Area 1 in this NPS-IS Plan is from stormwater runoff. Restoration efforts in this critical area will focus on stormwater management that will improve aquatic habitat. The focus in Critical Area 1 will be in addressing stormwater runoff along the main stem of the Blanchard River in Findlay, Howard Run, and Dalzell Ditch, as shown in Map 3.1 on page 20.

Goals

The overall goal for any nine element NPS-IS Plan is to improve IBI, Mlwb, ICI, and QHEI scores so full attainment status of the designated aquatic life use for that waterway can be achieved. **The Howard Run-Blanchard River HUC-12** is in *Non-Attainment* of its designated Warmwater Habitat aquatic life use in Critical Area 1. This attainment status is due to fish and macroinvertebrate communities not reaching the targeted values at all four sites. The habitat score needs to be improved at three of the four sites. The goals for Critical Area 1 will be to improve the IBI, ICI, and Mlwb scores while improving the QHEI score, so all four sites will reach full attainment status of the designated WWH aquatic life use. With the restoration activities that have already completed, and by addressing stormwater, the goals should be achieved. These goals are to specifically:

Goal 1. Achieve an IBI score of 40 at all four sampling sites (RM 54.70, 54.80, 57.30, 57.80)

- NOT ACHIEVED: Sites RM 54.70, 54.80, & 57.80 currently have scores of 36, 38 & 36 respectfully). ACHIEVED: The site at RM 57.30 score is 42, which is in attainment

Goal 2. Achieve an ICI score of 42 at all four sampling sites (RM 55.20, 56.90, 57.30, 57.80)

- NOT ACHIEVED: Sites RM 56.90, 57.30 & 57.80 currently have scores of 16, 24 & 12 respectfully, which ranges from poor to fair). ACHIEVED: The site at RM 57.30 score is 42, which is in attainment.

Goal 3. Achieve an QHEI score of 60 at all four sampling sites (RM 55.20, 56.90, 57.30, 57.80)

- NOT ACHIEVED: Sites RM 54.70, 54.80 & 57.80 currently have scores of 54.5, 56.5 & 46 respectfully. ACHIEVED: The site at RM 57.30 score is 63, which is in attainment.

Objectives for Critical Area 1

In order to achieve the overall nonpoint source restoration goal of reaching *Full Attainment* in the **Howard Run-Blanchard River HUC-12**, the following objectives need to be completed within Critical Area 1. *(These objectives are in addition to the work that has already been done.)*

Objective 1. Control and reduce sediment and nutrient loading from stormwater inputs in riparian areas to improve the QHEI score to the attainment level of at least 60.

- **1a**. Construct at least 0.5 acres of vegetated bioswales along the Blanchard River, Howard Run, and Dalzell Ditch.
- **1b.** Create at least 4.0 acres of retention basins for passive stormwater treatment.
- **1c.** Install at least 0.5 acres of rain gardens.
- **1d.** Establish 2 acres of native grass buffers along the waterways
- **1e.** Create 2 acres of wooded riparian buffers
- Implement green infrastructure projects that will detain, retain and/or treat stormwater runoff from at least 80 acres of urbanized impermeable surfaces.

NOTE: The objective will involve areas that are in the flood plain and are a part of flood mitigation. The potential projects that are still being planned are not short term. Thus, there will not be any project proposals for these projects in this plan. They will be added at a future time. There are additional areas where the above BMPs will be installed as the Blanchard River Flood Mitigation Plan is completed and implemented. At this time, only the short-term projects are included in Table 3.5.

Table 3.5: Estimated Phosphorus Loading Reduction from each Objective Critical Area 1

Objective Number	Best Management Practice	Total Acreage Of BMP	Estimated Annual Phosphorus Load Reduction (lbs)	Estimated Spring Phosphorus Load Reduction (lbs)
1	Bioswales	0.5	10.0	4.1
2	Retention Basins	4.0	200.0	42.0
3	Rain Gardens	0.5	3.0	1.7
4	Native Grass Buffers	2.0	150.0	80.2
5	Wooded Riparian Buffers	2.0	300.0	123.0
Total		**9.0**	**663.0**	**251.0**

Water quality monitoring plays an integral part of any implementation process. Both routinely scheduled and project-specific monitoring should be conducted to determine progress towards meeting the water quality standards set by the Ohio EPA. The above objective will be reevaluated and modified as necessary. New objectives will be added as needed to further the progress towards attainment goals, or altered if better best management practices are found. The Ohio EPA Nonpoint Source Management Plan Update (Ohio EPA, 2013) will be used to help as a reevaluation tool for its listing of all eligible NPS management strategies to consider including:

- Altered Stream and Habitat Restoration Strategies,
- Nonpoint Source Reduction Strategies; and
- Urban Sediment and Nutrient Reduction Strategies.

3.3 Critical Area 2: Conditions, goals, and objectives for the Howard Run-Blanchard River HUC-12 Watershed

3.3.1 Detailed Characterization

The area defined in the **Howard Run-Blanchard River HUC-12 Watershed** as Critical Area 2 will include all the cropland (12,556 acres). Map 3.4 on the next page shows the two priority areas on which the BMPs will be focused. According to the 2009 TMDL report, the cropland acres of the Eagle Creek watershed, which includes the **Howard Run-Blanchard River HUC-12,** are contributing to the significant load of phosphorus and sediment that is causing both near-field (Blanchard River) and far-field (Lake Erie) impairments. Table 3.6 on the next page shows

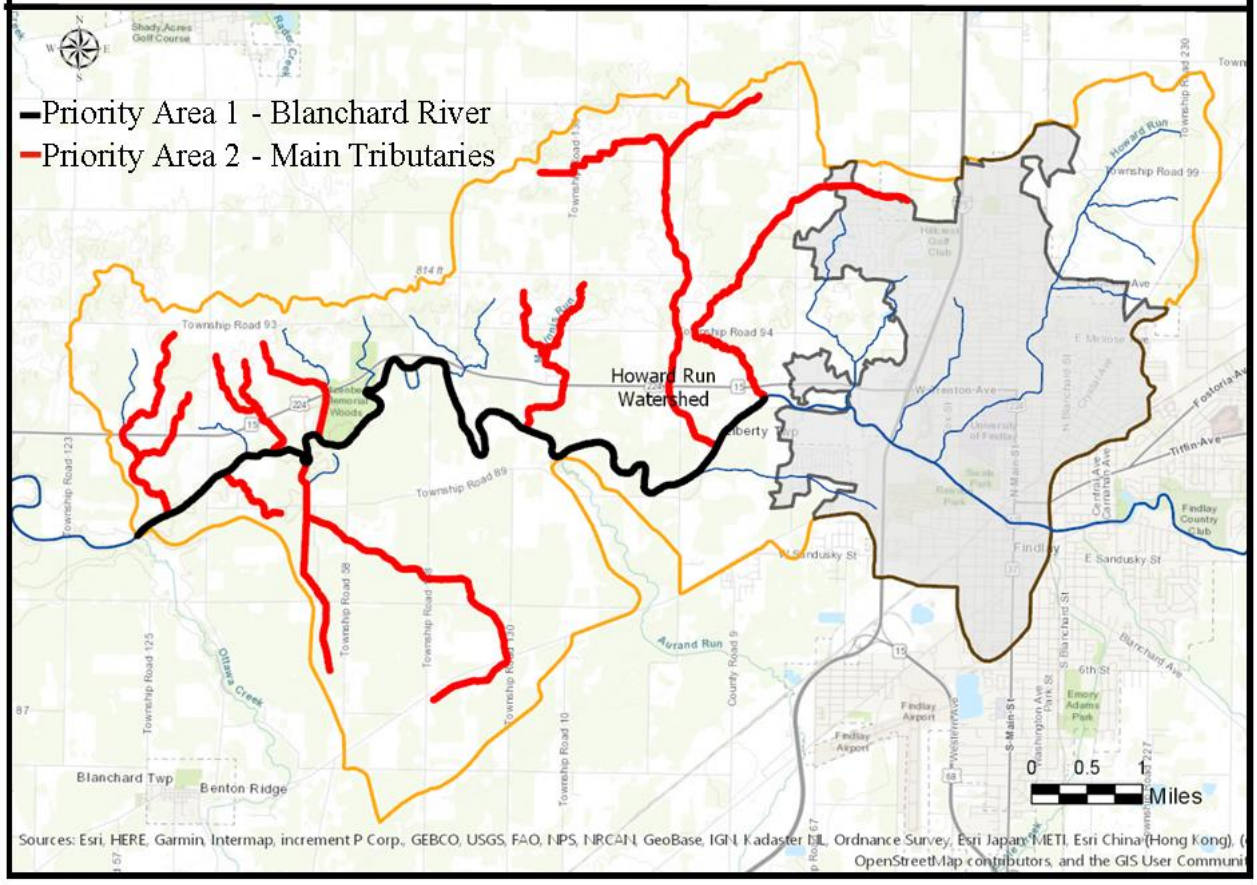
the estimated spring phosphorus loading for the watershed. Since the phosphorus loading will not be equal throughout the watershed, Critical Area 2 will be prioritized as follows:

- **Priority 1:** Crop parcels (fields) adjacent to the main stem of tributaries that empty into the Blanchard River (approximately 2,300 acres).
- **Priority 2:** All remaining crop parcels (fields) in the watershed not found in priorities 2 & 3 (approximately 900 acres).

Table 3.6: Estimated Spring Phosphorus Loadings from Contributing NPS Sources in the Howard Run-Blanchard River HUC-12

	Agricultural Load (lbs)	Developed/Urban Load (lbs)	Natural Load (lbs)	HSTS Load (lbs)	NPS Total (lbs)
Current Estimates*	12,000	2,800	160	450	15,000
Target Estimates*	7,200	1,650	96	270	9,000
(Source: OEPA) **Estimated using two significant figures*					

Map 3.4: Agriculture Cropland with Priority Areas



In addition to the performance-based incentive for the incorporation of nutrients, other NPS pollution leaving the cropland from surface run-off and/or subsurface drainage will also be addressed using appropriate Best Management Practices (BMPs).

These BMPs will focus on:

- Reducing the rate and amount of surface runoff,
- Reducing phosphorus loading from tile drainage, via treatment, volume reduction, and discharge controls,
- Drainage management systems, and
- Soil test for phosphorus reduction.

3.3.2 Detailed Cause(s) and Associated Sources

The 2009 TMDL Report reports that there are impairments in Eagle Creek related to Agriculture uses. The TMDL report noted that "*excessive phosphorus and nitrates have been observed in the Eagle Creek and the Blanchard River, especially during high flows. Load reductions are needed from both agricultural and urban runoff during spring and fall.*" ***The focus will be on the springtime phosphorus loading*** that is having a far-field effect in Lake Erie. The other causes listed in Table 3.7 below, will also be addressed. Even though the two TMDL sites located on the Blanchard River (RM 49.8 and 46.5) and within the agricultural land use for the **Howard Run-Blanchard River HUC-12** watershed were in full attainment, addressing loading from agriculture land is needed to help meet the load reduction for the entire Eagle Creek and Blanchard River watershed. ***NOTE: No TMDL sites were in the several tributaries that empty into the Blanchard River in Critical Area 2.*** The contributing causes and sources associated with crop production in Critical Area 2 are shown below in Table 3.7.

Table 3.7: Causes and Sources of Impairments in Critical Area 2

Causes	Sources
Phosphorus	Channelization - agriculture Crop production
Nitrates	Channelization - agriculture Crop production
Sedimentation	Removal of riparian vegetation - agriculture Destabilization of streambank -agriculture
Direct Habitat Alteration	Crop Production

3.3.3 Outline Goals and Objectives for Critical Area 2

As noted above, Critical Area 2 is mainly impaired by nutrient loading (P & N), sedimentation, and direct habitat alteration due to agriculture uses. Therefore, the focus in developing goals to address these impairments in Critical Area 2 will be to meet the 40% reduction in springtime phosphorus loading. By meeting this goal, the other impairments will also be addressed.

1. Soil test fields that have not been tested within the last two years and are directly adjacent to a waterway.
2. Once the results of the soil tests are known, those fields with the highest phosphorus levels will be addressed first using acceptable Best Management Practices (BMPs).
3. The remaining fields in Critical Area 2 will be soil tested, and acceptable BMPs will be used to reduce phosphorus loads.
    a. ***NOTE: Soil testing is not eligible for funding under the EPA 319 program. Funding will be sought from other sources.***
4. Edge of field conservation practices, such as cover crops, conservation tillage, filter strips, and buffers, will be used to reduce sediment and nutrient loading during runoff and drainage events.
5. Soluble phosphorus loading that occurs through drainage tile will be addressed using Controlled Drainage Structures and Phosphorus Filters.

Goals for Critical Area 2 – Springtime Phosphorus Load Reduction from Cropland

- Goal 1: To reduce springtime phosphorus loading from cropland in the watershed by 4,800 pounds annually to meet the reduction goal consistent with Ohio's Domestic Action Plan.

NOTE: Although there was no goal for the reduction of sediment in the TMDL Report, efforts will be made to prevent sediment loading.

Objectives for Critical Area 2

In order to achieve the goals listed above for nonpoint source load reduction for phosphorus in the **Howard Run-Blanchard River HUC-12** watershed, the following objectives that address nutrient loading need to be achieved in Critical Area 2. These objectives are prioritized to achieve the greatest results in Critical Area 2.

- Objective 1: To establish Control Drainage Water Management Systems to manage water draining 100 acres. (5 structures averaging 20 acres per structure. (NCRS 554))

- Objective 2: To install a phosphorus filter on two main drain outlets tile leading from fields that are more than 1000 feet from the main stem or a tributary to capture dissolved reactive phosphorus (DRP) (NRCS 782). **NOTE: the filter could be installed in the tributary if approved by the Hancock County Engineer and HSWCD.**

- Objective 3: Enroll 1,400 acres of cropland in a precision nutrient management plan that includes cover crops, conservation tillage, soil test for phosphorus and soil organic material (SOM), and proper placement of fertilizer. (590)

- Objective 4: Soil test 8,000 of the acres in Critical Area 2.

- Objective 5: Enroll 4,400 acres per year of cropland in cover crops (NRCS 340).

- Objective 6: Enroll 4,400 acres per year of cropland in conservation tillage (NRCS 329).

As these objectives are implemented, chemical testing should be conducted near the mouth of the tributaries flowing into the Blanchard River during rain events and/or at least once a month to measure the phosphorus and nitrogen levels. The data will provide an idea of the progress made towards meeting the listed goals. All objectives will be reevaluated yearly to see if any modifications are needed.

When reevaluating the restoration efforts, the participating agencies and individuals will look at the BMPs being used, the interest of the farmers, and the data that has been collected to see if there should be a modification to the goals and/or objectives. The appropriate agencies will use the Ohio EPA Nonpoint Source Management Plan Update (Ohio EPA 2014) as a reference for possible modifications.

Table 3.8: Estimated Nutrient Loading Reduction from Each Objective Critical Area 2

Objective Number	Best Management Practice	Total Acreage Treated	Estimated Annual Phosphorus Load Reduction (lbs)	Estimated Spring Phosphorus Load Reduction (lbs)
1	Water Controlled Structure	100	66	66
2	Phosphorus Filters	400	152	64
3	Nutrient Management Plans	1,400	1,540	635
5	Cover Crops	4,400	2,200	902
6	Conservation Tillage	4,400	1,320	545
	Total	**10,205***	**5,278**	**2,212**

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Chapter 4: Projects and Implementation Strategy for the City of Findlay Riverside Park-Blanchard River HUC-12

4.1 Overview Tables and Project Sheets for Critical Areas

As noted in Chapter 2, the **Howard Run-Blanchard River HUC-12** watershed impairments are mainly due to the urbanization and agriculture activities in the watershed. This chapter will discuss the projects and evaluations needed to restore the watershed as much as possible.

On the following pages are the projects and guidelines believed to be needed to improve the conditions in the **Howard Run -Blanchard River HUC-12** watershed to meet the goals of the TMDL Study for nutrient reduction, and for removing the impairment status for the watershed. It will be necessary to periodically reevaluate the status of the critical areas to determine if the projects are adequate enough to reach the goals outlined by the TMDL Report. There may be a need to use BMPs other than those listed in the projects. When the need for a specific BMP is found, a new project sheet with be created and submitted to the EPA for approval.

For the **Howard Run -Blanchard River HUC-12** watershed, there are two Critical Areas identified. Project and Implementation Strategy Overview Tables have been created for each area (subsections 4.2 and 4.3).

Project Summary Sheets (PSS) provide the nine elements adopted by the OEPA for the projects that have been developed and are in need of funding. If during implementation additional problems are identified, additional tables/projects will be developed. Any new PSS will be submitted to the OEPA for verification and funding eligibility.

4.2 Critical Area 1: Overview Table and Project Sheets for the Howard Run-Blanchard River HUC-12

Table 4.1 on the next page summarizes the Project and Implementation Strategy Overview Table for Critical Area 1. The table summarizes the projects needed for restoration of the nonpoint source impairments identified in the TMDL Report for the **Howard Run-Blanchard River HUC-12** watershed. Only the projects listed in the Project Summary Sheets will be eligible for state and federal funding. ***NOTE: Work that has been done by the City of Findlay and Hancock County Commissioners along the Blanchard Rive, (see page3-6), to reduce the impact of flooding in Critical Area 1 will also improve the water quality and Aquatic Use scores. The estimated benefit of the project should raise the QHEI score by three points, or 37.5%. The result is only 62.5% of the goal needs to be accomplishment by the projects recommended in the projects sheets.***

Table 4.1: Critical Area 1: Project Overview Table for the Howard Run-Blanchard River HUC-12 (04100008 03 04)							
Goal	**Objective**	**Project #**	**Project Title** (EPA Criteria g)	**Lead Organization** (EPA Criteria d)	**Time Frame** (EPA Criteria f)	**Estimated Cost** (EPA Criteria d)	**Potential/Actual Funding Source** (EPA Criteria d)
Urban Sediment and Nutrient Reduction Strategies							
1, 2, 3	1a	1	Bioswales along the Blanchard River, Howard Run, and Dalzell Ditch	City of Findlay	Short Term (1-3 years)	$150,000	H2Ohio, Section 319 grant, WRRSP, GLRI, and USFS
1, 2, 3	1b	2	Retention basins along the Blanchard River, Howard Run, and Dalzell Ditch	City of Findlay	Short Term (1-3 years)	$350,000	H2Ohio, Section 319 grant, WRRSP, GLRI, and USFS
1, 2, 3	1c	3	Rain Gardens along the Blanchard River, Howard Run, and Dalzell Ditch	City of Findlay	Short Term (1-3 years)	$150,000	H2Ohio, Section 319 grant, WRRSP, GLRI, and USFS
1, 2, 3	1d	4	Native Grass Buffers along the Blanchard River, Howard Run, and Dalzell Ditch	City of Findlay	Short Term (1-3 years)	$200,000	H2Ohio, Section 319 grant, WRRSP, GLRI, and USFS
1, 2, 3	1e	5	Wooded Riparian Buffers along the Blanchard River, Howard Run, and Dalzell Ditch	City of Findlay	Short Term (1-3 years)	$350,000	H2Ohio, Section 319 grant, WRRSP, GLRI, and USFS
Altered Stream and Habitat Restoration Strategies							
Agricultural Nonpoint Source Reduction Strategies							
High Quality Water Production Strategies							
Other NPS Causes and Associated Sources of Impairment							

4.2.1 Critical Area 1 Project Summary Sheets

The section presents the Project Summary Sheets that were developed based on the actions needed to minimize the nutrient and sediment loadings from stormwater runoff in the **Howard Run-Blanchard River HUC-12** watershed. These projects are the logical next steps or priority/short term projects needed to be accomplished in order to begin the restoration activities needed to address the impairments and to prevent the transport of the sediment and nutrients further down the watershed and eventually to Lake Erie. Medium- and long-term projects will not have a project summary sheet, as these projects are not ready for implementation. As a project comes to an end, an evaluation of the progress will be done to see if the project needs be continued.

Table 4.2: Project Summary Sheet Critical Area 1 Project 1: Bioswales in the Howard Run-Blanchard River HUC-12

Nine Element Criteria	Information	Explanation
n/a	Title	Bioswales along the Blanchard River, Howard Run, and Dalzell Ditch
criteria d	Project Lead Organization & Partners	City of Findlay, Hancock County Engineer, Hancock SWCD, and BRWP
criteria c	HUC-12 and Critical Area	Howard Run-Blanchard River HUC-12 (04100008 03 04)
criteria c	Location of Project	Howard Run-Blanchard River HUC-12, Blanchard River, Howard Run, Dalzell Ditch
n/a	Which strategy is being addressed by this project?	Urban Sediment and Nutrient Reduction Strategies
criteria f	Time Frame	Short Term (1-3 years)
criteria g	Short Description	Establish a minimum of 0.5 acres of bioswales
criteria g	Project Narrative	The City of Findlay, Hancock County Commissioners, and Flood Mitigation Study have identified areas of high stormwater input in the Howard Run watershed. Establishing 0.5 acres bioswales will be used to control erosion and reduce sediment and nutrient loading, which is caused by these areas of stormwater inputs. At least 0.25 acres of bioswales will be installed per year in the selected areas over the course of three years.
criteria g	Estimated Cost	$150,000
criteria g	Possible Funding Source	WRRSP Grant, Section 319 Grant, GLRI, and USFWS

Table 4.2: Project Summary Sheet Critical Area 1 Project 1: Bioswales in the Howard Run-Blanchard River HUC-12 cont.		
criteria a	Identified Causes & Sources	Causes of impairments • Nutrient loading • Sedimentation / siltation Sources of impairments • Urban runoff/storm water • Land development /suburbanization
criteria b & h	Part 1: How much improvement is needed to remove the NPS impairment for the whole Critical Area?	The goal is to achieve a QHEI score of 60, an IBI score of 42 and an ICI score of 42, which will allow the area to attainment the status of a WWH habitat in Critical Area 1.
criteria b & h	Part 2: How much of the needed improvement for the whole Critical Area is estimated to be accomplished by this project?	The main driver for determining whether the goals are reached in Critical Area 1 is QHEI. The goal is to reach a QHEI score of 60. The average QHEI score at three sites not in attainment is 52.3. Establishing 0.5 acres of bioswales in critical areas is estimated to result in an incremental increase in the QHEI score of 1 point at each site (or 12.5% of the progress needed toward the goal) over time. There should also be a similar increase in IBI, Mlwb. and ICI scores
criteria b & h	Part 3: Load Reduction?	Estimated: 10 lbs. P/year; 200 lbs. N/year; 10 tons sediment/year. ***Load reduction will vary depending on from what surface the stormwater runoff is originating. Impervious surfaces will not have much loading of P, N, or sediment.***
criteria i	How will the effectiveness of this project in addressing the NPS impairment be measured?	OEPA watershed-wide monitoring is expected to be conducted again in the summer of 2020 with the TMDL being scheduled for 2023. The BRWP will also conduct macroinvertebrate sampling and water quality monitoring at sampling sites throughout Howard Run HUC-12. These sampling sites will be selected in June of 2020.
criteria e	Information and Education	This project will be promoted to stakeholders and officials, using news releases articles, social media and personal contacts from the City of Findlay and the BRWP to stakeholders well.

Table 4.3: Project Summary Sheet Critical Area 1 Project 2: Retention Basins in the Howard Run-Blanchard River HUC-12		
Nine Element Criteria	**Information**	**Explanation**
n/a	Title	Retention Basins along the Blanchard River, Howard Run, and Dalzell Ditch
criteria d	Project Lead Organization & Partners	City of Findlay, Hancock County Engineer, Hancock SWCD, and BRWP
criteria c	HUC-12 and Critical Area	Howard Run-Blanchard River HUC-12 (04100008 03 04)
criteria c	Location of Project	Howard Run-Blanchard River HUC-12, Blanchard River, Howard Run, Dalzell Ditch
n/a	Which strategy is being addressed by this project?	Urban Sediment and Nutrient Reduction Strategies
criteria f	Time Frame	Short Term (1-3 years)
criteria g	Short Description	Establish 4 acres of retention basins. At least one acre of retention basins will be established per year over the course of three years.
criteria g	Project Narrative	There are areas along the Blanchard River, Howard Run, and Dalzell Ditch, where retention basins could be easily, and cost effectively established to catch and retain runoff and provide some treatment before the water enters the waterway. These areas have been identified by the City of Findlay, Hancock County Commissioners, and the Flood Mitigation Study. Establishing 4.0 acres of retention basins will be used to control erosion and reduce sediment and nutrient loading caused by stormwater inputs.
criteria g	Estimated Cost	$350,000
criteria g	Possible Funding Source	WRRSP Grant, Section 319 Grant, GLRI, and USFWS
criteria a	Identified Causes & Sources	Causes of impairments • Nutrient loading • Sedimentation / siltation Sources of impairments • Urban runoff/storm water • Land development/suburbanization
criteria b & h	Part 1: How much improvement is needed to remove the NPS impairment for the whole Critical Area?	The goal is to achieve a QHEI score of 60, an IBI score of 42 and an ICI score of 42, which will allow the area to attainment the status of a WWH habitat in Critical Area 1.

Table 4.3: Project Summary Sheet Critical Area 1 Project 2: Retention Basins in the Howard Run-Blanchard River HUC-12 cont.		
criteria b & h	Part 2: How much of the needed improvement for the whole Critical Area is estimated to be accomplished by this project?	The main driver for determining whether the goals are reached in Critical Area 1 is QHEI. The goal is to reach a QHEI score of 60. The average QHEI score at three sites not in attainment is 52.3. Establishing 4.0 acres of retention basins in critical areas is estimated to result in an incremental increase in the QHEI score 3 point at each site (or 37.5% of the progress needed toward the goal) over time. There should also be a similar increase in IBI, Mlwb. and ICI scores.
criteria b & h	Part 3: Load Reduction?	Estimated: 200 lbs. P/year; 800 lbs. N/year; 100 tons sediment/year
criteria i	How will the effectiveness of this project in addressing the NPS impairment be measured?	OEPA watershed-wide monitoring is expected to be conducted again in the summer of 2020 with the TMDL being scheduled for 2023. The BRWP will also conduct macroinvertebrate sampling and water quality monitoring at sampling sites throughout Howard Run HUC-12. These sampling sites will be selected in June of 2020.
criteria e	Information & Education	This project will be promoted to stakeholders and officials, using news releases articles, social media and personal contacts from the City of Findlay and the BRWP to stakeholders well.

Table 4.4: Project Summary Sheet Critical Area 1 Project 3: Rain Gardens in the Howard Run-Blanchard River HUC-12		
Nine Element Criteria	**Information needed**	**Explanation**
n/a	Title	Rain Gardens along the Blanchard River, Howard Run, and Dalzell Ditch
criteria d	Project Lead Organization &Partners	City of Findlay, Hancock County Engineer, Hancock SWCD, and BRWP
criteria c	HUC-12 and Critical Area	Howard Run-Blanchard River HUC-12 (04100008 03 04)
criteria c	Location of Project	Howard Run-Blanchard River HUC-12, Blanchard River, Howard Run, Dalzell Ditch
n/a	Which strategy is being addressed by this project?	Urban Sediment and Nutrient Reduction Strategies
criteria f	Time Frame	Short Term (1-3 years)
criteria g	Short Description	Install 5 rain gardens which in total comprise 0.5 acres.
criteria g	Project Narrative	Three areas were identified on the University of Findlay campus where three separate rain gardens could be installed along the perimeter of two main parking lots on campus property. These parking lots are adjacent to the Howard Run waterway. Findlay City Schools identified two areas for the installation of two separate rain gardens at Findlay High School, which would treat runoff from two main parking lots which are adjacent to the Howard Run waterway. The installation of these five rain gardens will total 0.5 acres in size, and will be used to control erosion and reduce sediment and nutrient loading caused by stormwater inputs.

Table 4.4: Project Summary Sheet Critical Area 1 Project 3: Rain Gardens in the Howard Run-Blanchard River HUC-12 cont.		
criteria d	Estimated Total Cost	$150,000
criteria d	Possible Funding Source	WRRSP Grant, Section 319 Grant, GLRI, and USFWS
criteria d	Identified Causes & Sources	Causes of impairments • Nutrient loading • Sedimentation / siltation Sources of impairments • Urban runoff/storm water • Land development/suburbanization
criteria b & h	Part 1: How much improvement is needed to remove the NPS impairment for the whole Critical Area?	The goal is to achieve a QHEI score of 60, an IBI score of 42 and an ICI score of 42, which will allow the area to attainment the status of a WWH habitat in Critical Area 1.
criteria b & h	Part 2: How much of the needed improvement for the whole Critical Area is estimated to be accomplished by this project?	The main driver for determining whether the goals are reached in Critical Area 1 is QHEI. The goal is to reach a QHEI score of 60. The average QHEI score at three sites not in attainment is 52.3. Establishing 0.5 acres of rain gardens in critical areas is estimated to result in an incremental increase in the QHEI score of 1 point at each site, (or 12.5% of the progress needed toward the goal), over time. There should also be a similar increase in IBI, Mlwb. and ICI scores.
criteria b & h	Part 3: Load Reduced?	Estimated: 10 lbs. P/year; 200 lbs. N/year; 10 tons sediment/year ***Load reduction will vary depending on from what surface the stormwater runoff is originating. Impervious surfaces will not have much loading of P, N, or sediment.***
criteria i	How will the effectiveness of this project in addressing the NPS impairment be measured?	OEPA watershed-wide monitoring is expected to be conducted again in the summer of 2020 with the TMDL being scheduled for 2023. Additionally, the BRWP will monitor the portion of Howard Run which flows through the University of Findlay campus, and the Findlay High School property. The BRWP will work with the University of Findlay to engage college students in water quality research projects to assess the effectiveness of the installed rain gardens.
criteria e	Information and Education	This project will be promoted to stakeholders and officials, using news releases articles, social media and personal contacts from the City of Findlay and the BRWP to stakeholders well.

Table 4.5: Project Summary Sheet Critical Area 1 Project 4: Native Grass Buffers in the Howard Run-Blanchard River HUC-12		
Nine Element Criteria	**Information needed**	**Explanation**
n/a	Title	Establishing native grass buffers along the riparian area Blanchard River, Howard Run, and Dalzell Ditch
criteria d	Project Lead Organization & Partners	City of Findlay, Hancock County Engineer, Hancock SWCD, and BRWP
criteria c	HUC-12 and Critical Area	Howard Run-Blanchard River HUC-12 (04100008 03 04)
criteria c	Location of Project	Howard Run-Blanchard River HUC-12, Blanchard River, Howard Run, Dalzell Ditch
n/a	Which strategy is being addressed by this project?	Urban Sediment and Nutrient Reduction Strategies
criteria f	Time Frame	Short Term (1-3 years)
criteria g	Short Description	Urban runoff has been identified as a source of impairment. Establishing 2 acres of native grass buffers will be useful in the treatment of stormwater runoff.
criteria g	Project Narrative	The City of Findlay, Hancock County Commissioners, and the University of Findlay has identified priority areas along the main stretch of Howard Run where native grasses could be easily and cost effectively established to catch and retain runoff, and provide some treatment before the water enters the waterway. Installation of 2 acres of native grass buffers will be used to control erosion and reduce sediment and nutrient loading caused by stormwater inputs.
criteria d	Estimated Total Cost	$50,000
criteria d	Possible Funding Source	WRRSP Grant, Section 319 Grant, GLRI, and USFWS
criteria a	Identified Causes & Sources	Causes of impairments • Nutrient loading • Sedimentation / siltation Sources of impairments • Urban runoff/storm water • Land development/suburbanization
criteria b&h	Part 1: How much improvement is needed to remove the NPS impairment for the whole Critical Area?	The goal is to achieve a QHEI score of 60, an IBI score of 42 and an ICI score of 42, which will allow the area to attainment the status of a WWH habitat in Critical Area 1.

Table 4.5: Project Summary Sheet Critical Area 1 Project 4: Native Grass Buffers in the Howard Run-Blanchard River HUC-12 cont.		
criteria b & h	Part 2: How much of the needed improvement for the whole Critical Area is estimated to be accomplished by this project?	The main driver for determining whether the goals are reached in Critical Area 1 is QHEI. The goal is to reach a QHEI score of 60. The average QHEI score at three sites not in attainment is 52.3. Establishing 2.0 acres of native grass buffers in critical areas is estimated to result in an incremental increase in the QHEI score of 2 point at each site (or 25.0% of the progress needed toward the goal) over time. There should also be a similar increase in IBI, Mlwb, and ICI scores.
criteria b & h	Part 3 Load Reduced?	Estimated: 150 lbs. P/year; 300 lbs. N/year; 40 tons sediment/year ***Load reduction will vary depending on from what surface the stormwater runoff is originating. Impervious surfaces will not have much loading of P, N , or sediment.***
criteria i	How will the effectiveness of this project in addressing the NPS impairment be measured?	OEPA watershed-wide monitoring is expected to be conducted again in the summer of 2020 with the TMDL being scheduled for 2023. The BRWP will also conduct macroinvertebrate sampling and water quality monitoring at sampling sites throughout Howard Run HUC-12. These sampling sites will be selected in June of 2020.
criteria e	Information and Education	This project will be promoted to stakeholders and officials, using news releases articles, social media and personal contacts from the City of Findlay and the BRWP to stakeholders well.

Table 4.6: Project Summary Sheet Critical Area 1 Project 5: Wooded Riparian Buffers in the Howard Run-Blanchard River HUC-12		
Nine Element Plan	**Information needed**	**Explanation**
n/a	Title	Establishing wooded riparian buffers along the riparian area Blanchard River, Howard Run, and Dalzell Ditch
criteria d	Project Lead Organization & Partners	Establishing wooded riparian buffers along the riparian area Blanchard River, Howard Run, and Dalzell Ditch
criteria c	HUC-12 and Critical Area	Howard Run-Blanchard River HUC-12 (04100008 03 04)
criteria c	Location of Project	Howard Run-Blanchard River HUC-12, Blanchard River, Howard Run, Dalzell Ditch
n/a	Which strategy is being addressed by this project?	Urban Sediment and Nutrient Reduction Strategies
criteria f	Time Frame	Short Term (1-3 years)
criteria g	Short Description	Establish 2 acres of wooded riparian buffers to capture and treat stormwater runoff in high-flow portions of Howard Run

Table 4.6: Project Summary Sheet Critical Area 1 Project 5: Wooded Riparian Buffers in the Howard Run-Blanchard River HUC-12 cont.		
criteria g	Project Narrative	Howard Run receives high levels of stormwater runoff. The combined stormwater discharge point in the Howard Run watershed experiences up to an estimated 85,000 gallons/hour during rain events. Establishing 2 acres of wooded riparian buffers within 100 yards of the Howard Run combined sewer discharge point will be used to control erosion and reduce sediment and nutrient loading caused by stormwater inputs.
criteria d	Estimated Total Cost	$350,000
criteria d	Possible Funding Source	WRRSP Grant, Section 319 Grant, GLRI, and USFWS
criteria a	Identified Causes & Sources	Causes of impairments • Nutrient loading • Sedimentation / siltation Sources of impairments • Urban runoff/storm water • Land development/suburbanization
criteria b & h	Part 1: How much improvement is needed to remove the NPS impairment for the whole Critical Area?	The goal is to achieve a QHEI score of 60, an IBI score of 42 and an ICI score of 42, which will allow the area to attainment the status of a WWH habitat in Critical Area 1.
criteria b & h	Part 2: How much of the needed improvement for the whole Critical Area is estimated to be accomplished by this project?	The main driver for determining whether the goals are reached in Critical Area 1 is QHEI. The goal is to reach a QHEI score of 60. The average QHEI score at three sites not in attainment is 52.3. Establishing 2.0 acres of wooded riparian buffers in Critical Areas 1 is estimated to result in an incremental increase in the QHEI score of 2 point at each site, (or 25.0% of the progress needed toward the goal), over time. There should also be a similar increase in IBI, Mlwb, and ICI scores.
criteria b & h	Part 3: Load Reduced?	Estimated: 300 lbs. P/year; 700 lbs. N/year; 100 tons sediment/year ***Load reduction will vary depending on from what surface the stormwater runoff is originating. Impervious surfaces will not have much loading of P, N, or sediment***
criteria i	How will the effectiveness of this project in addressing the NPS impairment be measured?	The BRWP will conduct macroinvertebrate sampling and water quality monitoring at sampling sites throughout Howard Run HUC-12. These sampling sites will be selected in June of 2020.
criteria e	Information and Education	This project will be promoted to stakeholders and officials, using news releases articles, social media and personal

		contacts from the City of Findlay and the BRWP to stakeholders well.

4.3 Critical Area 2: Overview Table and Project Sheets for the Howard Run-Blanchard River HUC-12

Table 4.7 on the next page summarizes the Project and Implementation Strategy Overview Table for Critical Area 2. The table summarizes the projects needed for restoration of the nonpoint source impairments identified in the TMDL Report for the **Howard Run-Blanchard River HUC-12** watershed. Only the projects listed in the Project Summary Sheets will be eligible for state and federal funding.

4.3.1 Critical Area 2 Project Summary Sheets

The section presents the Project Summary Sheets that were developed based on the actions needed to minimize the nutrient and sediment loadings from cropland in the **Howard Run--Blanchard River HUC-12** watershed. These projects are the logical next steps or priority/short term projects needed to be accomplished in order to begin the restoration activities needed to address the impairments and to prevent the transport of the sediment and nutrients further down the watershed and eventually to Lake Erie. Medium- and long-term projects will not have a project summary sheet, as these projects are not ready for implementation. As a project comes to an end, an evaluation of the progress will be done to see if the project needs to be continued.

Table 4.7: Critical Area 2: Project Overview Table for the Howard Run-Blanchard River HUC-12 (04100008 03 04)						
Goal	**Objective**	**Project Title** (EPA Criteria g)	**Lead Organization** (EPA Criteria d)	**Time Frame** (EPA Criteria f)	**Estimated Cost** (EPA Criteria d)	**Potential/Actual Funding Source** (EPA Criteria d)
Urban Sediment and Nutrient Reduction Strategies						
Altered Stream and Habitat Restoration Strategies						
Agricultural Nonpoint Source Reduction Strategies						
1, 1a	1	Implementing Controlled Drainage Management systems to reduce DRP and N	Hancock SWCD	Short Term (1-3 years)	$24,000	EQIP, USDA, Section 319 grant, GLB, H2Ohio
1, 1a	2	Installing phosphorus filters on a main tile leading to the river or creek from upland fields	Hancock SWCD	Short Term (1-3 years)	$40,000	EQIP, USDA, Section 319 grant, GLB, H2Ohio
1, 1a	3	Precision Nutrient Management Plan	Hancock SWCD	Short Term (1-3 years)	$5,000	EQIP, USDA, Section 319 grant, GLB, H2Ohio
	4	Soil Testing for Phosphorus, Nitrogen, and SOM	Hancock SWCD	Short Term (1-3 years)	$56,000	EQIP, USDA, GLB, H2Ohio
1, 1a	5	Establishing Cover Crops to reduce P, N, and sediment loading	Hancock SWCD	Short Term (1-3 years)	$176,000	EQIP, USDA, Section 319 grant, GLB, H2Ohio
1, 1a	6	Establishing Conservation Tillage to reduce P, N, and sediment loading	Hancock SWCD	Short Term (1-3 years)	$66,00	EQIP, USDA, Section 319 grant, GLB, H2Ohio
High Quality Water Production Strategies						
Other NPS Causes and Associated Sources of Impairment						

Table 4.8: Project Summary Sheet Critical Area 2 Project 1: Controlled Drainage Water Management in the Howard Run-Blanchard River HUC-12		
Nine Element Criteria	**Information needed**	**Explanation**
n/a	Title	Controlled Drainage Water Management
criteria d	Project Lead Organization & Partners	Hancock SWCD, NRCS, USDA, and BRWP
criteria c	HUC-12 and Critical Area	Howard Run-Blanchard River HUC-12 (04100008 03 04)
criteria c	Location of Project	Howard Run-Blanchard River HUC-12 west of Findlay Cropland Areas
n/a	Which strategy is being addressed by this project?	Agricultural Nonpoint Source Reduction Strategy
criteria f	Time Frame	Short Term (1-3 years)
criteria g	Short Description	Control Drainage Water Management Systems will be used reduce the P loading from tile drainage.
criteria g	Project Narrative	The Hancock SWCD will work with landowners to install controlled drainage water management structures in tiles to drain at least 20 acres. The goal is to 5 install water control structures to control 100 acres of cropland.
criteria d	Estimated Total Cost	$24,000
criteria d	Possible Funding Source	Ohio EPA 319, Great Lakes Sediment and Nutrient Reduction Program, NRCS EQIP, USDA-CIG
criteria a	Identified Causes & Sources	Cause(s): Nutrient & Sediment loading Source(s): Crop Production
criteria b&h	Part 1: How much improvement is needed to remove the NPS impairment for the whole Critical Area?	The springtime phosphorus loading needs to be reduced 4,800 pounds annually from the watershed.
criteria b&h	Part 2: How much of the needed improvement for the whole Critical Area is estimated to be accomplished by this project?	Controlled drainage water management will be established on 100 acres. The estimated reduction of dissolved reactive phosphorus (DRP) will be 66 lbs./yr., or 1.4% of the goal. In addition, there will be an estimated 50 lbs./yr. of nitrogen.

Table 4.8: Project Summary Sheet Critical Area 2 Project 1: Controlled Drainage Water Management in the Howard Run-Blanchard River HUC-12 cont.		
criteria b & h	Part 3: Load Reduced	Estimated: 66 lbs. P/year and 50 lbs./year nitrogen
criteria i	How will the effectiveness of this project in addressing the NPS impairment be measured?	OEPA watershed-wide monitoring is expected to be conducted again in the summer of 2020 with the TMDL being scheduled for 2023.
criteria e	Information and Education	This project will be promoted to the producers and other stakeholders with public meetings, news releases articles, social media and personal contacts from the Hancock SWCD, NRCS and the BRWP to eligible producers. The overall reduction and improvements will be shared with the public as well.

Table 4.9: Project Summary Sheet Critical Area 2 Project 2: Phosphorus Filters in the Howard Run-Blanchard River HUC-12		
criteria a	Identified Causes & Sources	Cause(s): Nutrient & Sediment loading Source(s): Crop Production
criteria b & h	Part 1: How much improvement is needed to remove the NPS impairment for the whole Critical Area?	The springtime phosphorus loading needs to be reduced 4,800 pounds annually from the watershed.
criteria b & h	Part 2: How much of the needed improvement for the whole Critical Area is estimated to be accomplished by this project?	The use of two Phosphorus Filters will reduce the DRP by an estimated 400 pounds per year. This would be 8.3% of the goal.
criteria b & h	Part 3: Load Reduced?	Estimated: 400 lbs. of P/year
criteria i	How will the effectiveness of this project in addressing the NPS impairment be measured?	OEPA watershed-wide monitoring is expected to be conducted again in the summer of 2020 with the TMDL being scheduled for 2023.
criteria e	Information and Education	This project will be promoted to the producers and other stakeholders with public meetings, news releases articles, social media and personal contacts from the Hancock SWCD, NRCS and the BRWP to eligible producers. The overall reduction and improvements will be shared with the public as well.

Table 4.9: Project Summary Sheet Critical Area 2 Project 2: Phosphorus Filters in the Howard Run-Blanchard River HUC-12 cont.		
Nine Element Criteria	**Information needed**	**Explanation**
n/a	Title	Phosphorus Filter
criteria d	Project Lead Organization & Partners	Hancock SWCD, NRCS, USDA, and BRWP
criteria c	HUC-12 and Critical Area	Howard Run-Blanchard River HUC-12 (04100008 03 04)
criteria c	Location of Project	Howard Run-Blanchard River HUC-12 west of Findlay Cropland Areas
n/a	Which strategy is being addressed by this project?	Agricultural Nonpoint Source Reduction Strategy
criteria f	Time Frame	Short Term (1-3 years)
criteria g	Short Description	Phosphorus filter(s) will be installed on tile from fields that are more than 1000 feet from a tributary or in the tributary.
criteria g	Project Narrative	Hancock SWCD will work with local landowners to install 2 phosphorus filters on field tile lead from fields that are more than 1000 feet from the Blanchard River. The P filters will remove DRP has been identified as the main source of P flowing into Lake Erie. The filters will control at least 80 acres of cropland.
criteria d	Estimated Total Cost	$40,000
criteria d	Possible Funding Source	Ohio EPA 319, Great Lakes Sediment and Nutrient Reduction Program, NRCS EQIP, USDA-CIG

Table 4.10: Project Summary Sheet Critical Area 2 Project 3: Nutrient Management Plan in the Howard Run-Blanchard River HUC-12		
Nine Element Criteria	**Information needed**	**Explanation**
n/a	Title	Nutrient Management Planning
criteria d	Project Lead Organization & Partners	Hancock SWCD, NRCS, USDA, and BRWP
criteria c	HUC-12 and Critical Area	Howard Run-Blanchard River HUC-12 (04100008 03 04)
criteria c	Location of Project	Howard Run-Blanchard River HUC-12 west of Findlay Cropland Areas
n/a	Which strategy is being addressed by this project?	Agricultural Nonpoint Source Reduction Strategy
criteria f	Time Frame	Short Term (1-3 years)
criteria g	Short Description	Create Nutrient Management Plans
criteria g	Project Narrative	Hancock SWCD will work with local landowners in the prioritized cropland to create nutrient management plans to cover at least 1,400 acres.
criteria d	Estimated Total Cost	$5,000
criteria d	Possible Funding Sources	Ohio EPA 319, Great Lakes Sediment and Nutrient Reduction Program, NRCS EQIP, USDA-CIG, H2Ohio
criteria a	Identified Causes & Sources	Cause(s): Nutrient loadings, leading to far-field impacts Sources(s): Cropland
criteria b & h	Part 1: How much improvement is needed to remove the NPS impairment for the whole Critical Area?	The goal is to reduce the springtime phosphorus loading by 4,800 pounds per year from the watershed.
criteria b & h	Part 2: How much of the needed improvement for the whole Critical Area is estimated to be accomplished by this project?	The overall goal in Critical Area 2 is to reduce the springtime phosphorus load. The needed reduction from the cropland area is 4,800 pounds per year. It is expected that nutrient management planning will result in a springtime phosphorus load reduction of 1,120 pounds per year, or 23.3%
criteria b & h	Part 3: Load Reduced?	Estimated: Phosphorus – 1,120 lbs./yr.; 420 tons/year of sediment and Nitrogen – 50,820 lbs./yr.
criteria a	Identified Causes & Sources	Cause(s): Nutrient loading, leading to far-field impacts Sources(s): Crop production

Table 4.10: Summary Sheet Critical Area 2 Project 3: Precision Nutrient Management Plan in the Howard Run-Blanchard River HUC-12 cont.		
criteria i	How will the effectiveness of this project in addressing the NPS impairment to be measured?	OEPA watershed-wide monitoring is expected to be conducted again in the summer of 2020 with the TMDL being scheduled for 2023.
criteria e	Information and Education	This project will be promoted to the producers and other stakeholders with public meetings, news releases articles, social media and personal contacts from the Hancock SWCD, NRCS and the BRWP to eligible producers. The overall reduction and improvements with be shared with the public as well.

Table 4.11: Summary Sheet Critical Area 2 Project 4 Soil Testing in the Howard Run-Blanchard River HUC-12		
n/a	Title	Soil Testing
criteria d	Project Lead Organization & Partners	Hancock SWCD, NRCS, USDA, and BRWP
criteria c	HUC-12 and Critical Area	Howard Run-Blanchard River HUC-12 (04100008 03 04)
criteria c	Location of Project	Howard Run-Blanchard River HUC-12 west of Findlay Cropland Areas
n/a	Which strategy is being addressed by this project?	Agricultural Nonpoint Source Reduction Strategy
criteria f	Time Frame	Short Term (1-3 years)
criteria g	Short Description	By soil testing the fields, the producer will be able to apply nutrients at the right rate and create a baseline for the SOM.
criteria g	Project Narrative	The goal of this project is to soil test 8,000 acres of cropland The soil testing will be conducted using a 2.5-acre grid method. The sampling data will be collected and shared with the producer and the agencies involved. Based on the soil test results the farmer will able to apply the proper amount of fertilizer. The cost will be $14.00/acre with $7.00/acres being paid by the farmer as match.
criteria d	Estimated Total Cost	$56,000
criteria d	Possible Funding Source	Great Lakes Sediment and Nutrient Reduction Program, NRCS EQIP, USDA-CIG
criteria a	Identified Causes & Sources	Cause(s): Nutrient loading, leading to far-field impacts Sources(s): Crop production

Table 4.11: Summary Sheet Critical Area 2 Project 4 Soil Testing in the Howard Run-Blanchard River HUC-12 cont.		
criteria b & h	Part 1: How much improvement is needed to remove the NPS impairment for the whole Critical Area?	The goal is to reduce the phosphorus loading by 4,800 pounds annually
criteria b & h	Part 2: How much of the needed improvement for the whole Critical Area is estimated to be accomplished by this project?	The phosphorus associated with sediment in the watershed based on the Nutrient Tracking tool 0.5 lbs./acre/year. If the SOM is raised by 1%, there would be 16,500 more gallons per acre of water held by the soil, instead of running off. This would result in an estimated load reduction of 8,750 lbs. phosphorus/year and would exceed the goal. In addition, there will be an estimated sediment reduction of tons/year and a reduction of 11,288 lbs. per yr. of Nitrogen.
criteria b & h	Part 3: Load Reduced?	None
criteria i	How will the effectiveness of this project in addressing the NPS impairment be measured?	OEPA watershed-wide monitoring is expected to be conducted again in the summer of 2020 with the TMDL being scheduled for 2023.
criteria e	Information and Education	This project will be promoted to the producers and other stakeholders with public meetings, news releases articles, social media and personal contacts from the Hancock SWCD, NRCS and the BRWP to eligible producers. The overall reduction and improvements will be shared with the public as well.

Table 4.12: Summary Sheet Critical Area 2 Project 5: Cover Crops in the Howard Run-Blanchard River HUC-12		
Nine Element Criteria	**Information needed**	**Explanation**
n/a	Title	Cover Crops
criteria d	Project Lead Organization & Partners	Hancock SWCD, NRCS, USDA, and BRWP
criteria c	HUC-12 and Critical Area	Howard Run-Blanchard River HUC-12 (04100008 03 04)
criteria c	Location of Project	Howard Run-Blanchard River HUC-12 west of Findlay Cropland Areas
n/a	Which strategy is being addressed by this project?	Agricultural Nonpoint Source Reduction Strategy
criteria f	Time Frame	Short Term (1-3 years)
criteria g	Short Description	Establish Cover Crops on Cropland
criteria g	Project Narrative	The Hancock SWCD will work with landowners to establish cover crops on 4,400 acres per year. Cover crops keep growing vegetation on the cropland during the no-growing season, Cover crops also help to prevent erosion and increase nutrient assimilation. Cover crops also help to increase the SOM in the soil which will further prevent water
criteria d	Estimated Total Cost	$176,000
criteria d	Possible Funding Source	H2Ohio, Ohio EPA 319, Great Lakes Sediment and Nutrient Reduction Program, NRCS EQIP, USDA-CIG
criteria b & h	Part 1: How much improvement is needed to remove the NPS impairment for the whole Critical Area?	The goal is to reduce the phosphorus loading by 4,800 pounds per year from the watershed
criteria b & h	Part 2: How much of the needed improvement for the whole Critical Area is estimated to be accomplished by this project?	Cover Crops will reduce spring phosphorus loading by an estimated 2,200 lbs./yr., or 45.8% of the goal.
criteria b & h	Part 3: Load Reduced?	Estimated: 2,200 lbs. P/year, 440 tons/year sediment and 99,000 lbs./year nitrogen
criteria a	Identified Causes & Sources	Cause(s): Nutrient loading, leading to far-field impacts Sources(s): Crop production

Table 4.12: Summary Sheet Critical Area 2 Project 5: Cover Crops in the Howard Run-Blanchard River HUC-12 cont.		
Nine Element Criteria	**Information needed**	**Explanation**
criteria i	How will the effectiveness of this project in addressing the NPS impairment to be measured?	OEPA watershed-wide monitoring is expected to be conducted again in the summer of 2020 with the TMDL being scheduled for 2023.
criteria e	Information and Education	This project will be promoted to the producers and other stakeholders with public meetings, news releases articles, social media and personal contacts from the Hancock SWCD, NRCS and the BRWP to eligible producers. The overall reduction and improvements with be shared with the public as well.

Table 4.13: Summary Sheet Critical Area 2 Project 6: Conservation Tillage in the Howard Run-Blanchard River HUC-12		
Nine Element Criteria	**Information needed**	**Explanation**
n/a	Title	Conservation Tillage
criteria d	Project Lead Organization & Partners	Hancock SWCD, NRCS, USDA, and BRWP
criteria c	HUC-12 and Critical Area	Howard Run-Blanchard River HUC-12 (04100008 03 04)
criteria c	Location of Project	Howard Run-Blanchard River HUC-12 west of Findlay Cropland Areas
n/a	Which strategy is being addressed by this project?	Agricultural Nonpoint Source Reduction Strategy
criteria f	Time Frame	Short Term (1-3 years)
criteria g	Short Description	Conservation Tillage is a BMP that a producer can use to reduce nutrient and sediment loadings by minimizing tillage.
criteria g	Project Narrative	The Hancock SWCD will work with landowners to establish conservation Tillage on 4,400 acres per year. Conservation Tillage is useful in reducing phosphorus loading.
criteria d	Estimated Total Cost	$66,000
criteria d	Possible Funding Source	H2Ohio, Ohio EPA 319, Great Lakes Sediment and Nutrient Reduction Program, NRCS EQIP, USDA-CIG
criteria b & h	Part 1: How much improvement is needed to remove the NPS impairment for the whole Critical Area?	The goal is to reduce the phosphorus loading by 4,800 pounds per year from the watershed

Table 4.13: Summary Sheet Critical Area 2 Project 6: Conservation Tillage in the Howard Run-Blanchard River HUC-12 cont.		
Nine Element Criteria	**Information needed**	**Explanation**
criteria b & h	Part 2: How much of the needed improvement for the whole Critical Area is estimated to be accomplished by this project?	Conservation Tillage will reduce spring phosphorus loading by an estimated 1,320 lbs./yr., or 27.5% of the goal.
criteria b & h	Part 3: Load Reduced?	Estimated: 1,320 lbs. P/year, 880 tons/year sediment and 60,720 lbs./year nitrogen
criteria a	Identified Causes & Sources	Cause(s): Nutrient loading, leading to far-field impacts Sources(s): Crop production
criteria i	How will the effectiveness of this project in addressing the NPS impairment to be measured?	OEPA watershed-wide monitoring is expected to be conducted again in the summer of 2020 with the TMDL being scheduled for 2023.
criteria e	Information and Education	This project will be promoted to the producers and other stakeholders with public meetings, news releases articles, social media and personal contacts from the Hancock SWCD, NRCS and the BRWP to eligible producers. The overall reduction and improvements with be shared with the public as well as on social media and personal contacts from the Hancock SWCD, NRCS and the BRWP to eligible producers. The overall reduction and improvements with be shared with the public as well.

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Appendix Table A-1 Summary of the NPDES Permits – Howard Run-Blanchard River HUC-12 (04100008 03 04)					
Applicant Name	**Facility Name**	**Permit Number**	**Issue Date**	**Average Design Flow (MGD)**	**Compliance History**
Individual Permits					
City of Findlay	Findlay WPCC	2PD00008*TD	6/19/2018	15.0	The only noted problem noted has been some overflow from upstream CSOs
National Lime and Stone Company	Tarbox Quarry	2IJ00064	2/16/2016	1.3	None reported
Industrial Storm Water General Permit List					
Graham Packaging Co	Graham Packaging Plant #55	2GR01923*EG	6/27/2018	None reported	None reported
McClane Company Inc	McClane Ohio	2GR02033*BG	3/26/2018	None reported	None reported
Toledo Shredding	Flag City Recycling LLC	2GR01539*EG	3/5/2012	None reported	None reported
Valfilm LLC	Valfilm Findlay Facility	2GR000261*FG	1/31/2018	None reported	None reported
Construction Storm Water General Permit List					
AEP Ohio Transmission Co,	Laydown Yard Phase 2	2GC05077*BG	10/12/2018	None reported	None reported
L. W. Associates	Crawford Station	2GC05186*BG	6/13/2018	None reported	None reported
Maumee Conservancy District	HCFRRP Blanchard River Hydraulic Improvements P1	2GC05394*AG	9/24/2018	None reported	None reported
Judson Palmer House	Judson Palmer House	2GC05574*AG	5/1/2019	None reported	None reported
Casey’s General Store	Casey’s General Store	2GC05582*AG	4/5/2019	None reported	None reported
City of Findlay	City of Findlay	2GQ0037*BG	11/20/2014	None reported	None reported