

Appendix E

Monitoring Strategy

This Appendix describes the existing monitoring locations and proposes monitoring goals to help track the progress of the Domestic Action Plan (DAP) directives. Also, a general outline of existing funding sources will be identified to assist long term planning and strategies to ensure long term success of the monitoring program. Table E1 and Figure E1 detail these efforts which are further discussed below.

There were 16 sites within the WLEB and Sandusky River watershed that had sufficient water quality and flow data for load calculations. These sites are maintained by both the NCWQR at Heidelberg University and the USGS. Funds for the load monitoring stations are from federal, state and local governments as well as private enterprises. These stations were chosen to better understand the impact of loading from different regions within the WLEB and provide data for nutrient loading trends. However, many of these stations have been added since 2007. Ensuring funding for these stations for the long term is critical to measuring the success of nutrient reduction efforts.

Most of the stations in the WLEB and Sandusky River watershed that were operational in 2014 were at sites representing large watershed areas. While these are useful in understanding nutrient loadings of these areas, at this scale it is difficult to understand the impact that management practices have on stream loading. Therefore, in late 2014 Ohio EPA received a grant to conduct enhanced water quality monitoring at smaller watersheds throughout the WLEB and Sandusky River watershed. Two of these stations are included in the group of 16 sites where loading calculations could be completed because the sampling was done at sufficient frequency by USGS.

As part of the Collaborative Framework development, Ohio EPA proposed eliminating six of the 2014 GLRI grant funded stations to consolidate resources that would result in better quality data at fewer sites. Two of the remaining stations were proposed to move to new locations based mostly on the watershed prioritization (Appendix C). Ohio EPA received additional funding at the end of 2016 to move/install monitoring sites and provide funding for sampling approximately two more years. In addition, Ohio EPA collaborated with the Ohio State University Sea Grant College Program to provide funding to increase monitoring at five sites (West Creek, S. Turkeyfoot Creek, Wolf Creek, Rock Creek, and the Huron River) where USGS will operate flow gages and NCWQR will begin conducting water quality sampling in late 2017.

The resulting network is presented in Table E1 and Figure E1. Two new large watershed water quality sites have been installed, one on each the St. Joseph and St. Marys Rivers. These two stations are critical for the State of Ohio to monitor progress toward the goals of the DAP in cooperation with Michigan and Indiana, who share jurisdiction in these watersheds. In addition, new gages and water quality sampling sites have been installed by USGS near the mouth of Platter Creek, and in the upper Auglaize River near Spencerville.

It is the goal of the over-all water quality monitoring strategy to eventually include monitoring data from edge of field, subwatershed, primary watersheds and Lake Erie to provide a total picture of nutrient sources and the nutrient delivery system.

Table E1: List of existing and proposed load monitoring stations in the Lake Erie basin within Ohio.

Geographic location	Monitoring Program Name	Sampling Agency	Timeframe
Data Sufficient for calculating loads in Western Basin			
Maumee River near Waterville, OH	Heidelberg Tributary Loading Program	NCWQR	1/10/1975-9/30/1978; 10/13/1981-current
Maumee River near Waterville, OH	GLRI	USGS	continuous data 2011 to current -- misc WQ to 1967
Sandusky River near Fremont	Heidelberg Tributary Loading Program	NCWQR	10/2/1974-current
Portage River at Woodville	Heidelberg Tributary Loading Program	NCWQR	8/30/2010-current
Blanchard River near Findlay	Heidelberg Tributary Loading Program	NCWQR	7/9/2007-current
Tiffin River at Stryker	Heidelberg Tributary Loading Program	NCWQR	7/9/2007-current
Unnamed Tributary to Lost Creek near Farmer	Heidelberg Tributary Loading Program	NCWQR	10/1/1981-9/30/1993; 10/1/2007-current
Honey Creek at Melmore	Heidelberg Tributary Loading Program	NCWQR	1/28/1976-current
Maumee River at Antwerp OH	WLEB OH DNR and WLEB OH EPA (continuous probes)	USGS	2013 to current -- misc WQ back to 1952
Tiffin River near Evansport OH	WLEB OH DNR	USGS	2013 to current
Blanchard River near Dupont OH	WLEB OH DNR	USGS	2013 to current -- Misc WQ back to 1966
Ottawa River near Kalida OH	WLEB OH DNR	USGS	2013 to current -- Misc WQ back to 1966
Auglaize River near Defiance OH	WLEB OH DNR	USGS	2013 to current -- Misc WQ back to 1952
Maumee River near Defiance OH	WLEB OH DNR	USGS	2013 to current -- Misc WQ back to 1952
Auglaize River near Fort Jennings OH	WLEB OH DNR	USGS	2013 to current -- Misc WQ back to 1965
Little Auglaize River at Melrose, OH	WLEB OH EPA	USGS	2015 to current
Platter Creek near Sherwood	WLEB OH EPA	USGS	March 2017 to current
St. Marys River near Willshire	WLEB OH EPA	USGS	March 2017 to current
St. Joseph River near Newville	WLEB OH EPA	USGS	March 2017 to current
Auglaize River near Spencerville	WLEB OH EPA	USGS	March 2017 to current
<u>Proposed to increase sampling frequency in Western Basin</u>			
Wolf Creek near Toledo @ Holland in Sylvania	Expanded Heidelberg Tributary Loading Program	NCWQR	Begin October 2017
S. Turkeyfoot Creek near Shunk @ Henry CR N	Expanded Heidelberg Tributary Loading Program	NCWQR	Begin October 2017

Rock Creek near Republic @Seneca CR 43	Expanded Heidelberg Tributary Loading Program	NCWQR	Begin October 2017
West Creek near Hamler @ SR 109	Expanded Heidelberg Tributary Loading Program	NCWQR	Begin October 2017
Data Sufficient for calculating load in the Central Basin			
Huron River at Milan	GLRI/Expanded Heidelberg Tributary Loading Program	USGS/ NCWQR	2014 to Current / Begin October 2017
Vermillion River near mouth	GLRI	USGS	2011 to current
Cuyahoga River at Independence	Expanded Heidelberg Tributary Loading Program	NCWQR	1981 to current
Grand River near Painesville	GLRI	USGS	Begin 2017

Lake Erie Western Basin Drainage in Ohio: USGS Flow Gages and Nutrient Monitoring Stations 2017

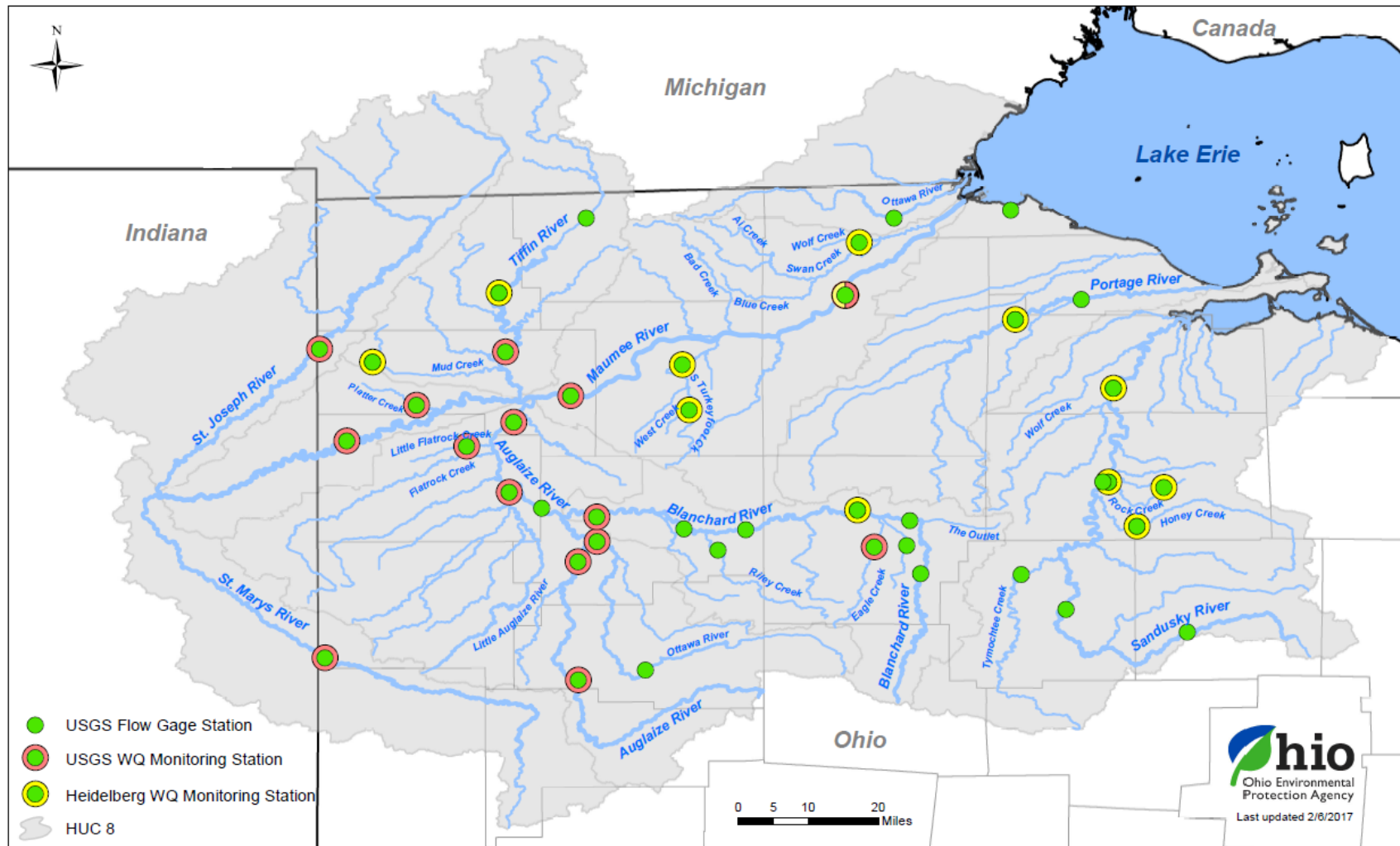


Figure E1: Existing and proposed load monitoring stations in the WLEB. All but four sites (West Creek, S. Turkeyfoot, Wolf Creek and Rock Creek) are operational as of August 2017.