Pennsylvania Fish & Boat Commission

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September 9, 2016

Department of Environmental Protection, Policy Office
Rachel Carson State Office Building
P.O. Box 2063
Harrisburg, PA 17105-2063

Re: PFBC Comments on the 2016 Draft Pennsylvania Integrated Water Quality Monitoring and Assessment Report

Dear Acting Secretary McDonnell:

Pennsylvania Fish and Boat Commission (PFBC) staff and I have carefully reviewed the subject 2016 draft report. PFBC recognizes the effort the Department of Environmental Protection has put forth in the compilation of the 2016 Draft Pennsylvania Integrated Water Quality Monitoring and Assessment Report. The Department has consistently met the Clean Water Act Section 305(b) reporting and the Section 303(d) listing requirements. The information contained within the Draft Integrated Report provides the status of the environmental conditions of the aquatic resources of the Commonwealth on a biennial basis. This comprehensive assessment has been instrumental in protecting the health of our Commonwealth's aquatic resources and people as well as meeting the fishable, swimmable goals of the Clean Water Act.

The Draft Integrated Report also provides information for those aquatic resources that are impacted by contaminants and other sources of pollution. The focus of our comments will be directed at Part C1.5. Susquehanna River Assessment. The PFBC has worked extensively with the Department to identify and assess impacts to the Smallmouth Bass population in the Susquehanna River. In 2005, there was a precipitous decline in the Smallmouth Bass population in the river from Sunbury to York Haven. Based on data collected by PFBC staff, the Smallmouth Bass population has not recovered to pre-2005 levels. These data have been fundamental to our agency's conclusion that the Susquehanna River is unhealthy and should be listed as impaired.

The PFBC has provided this information to the Department on numerous occasions including our staff input during the Causal Analysis Diagnosis Decision Information System (CADDIS) discussions in 2015. Data are detailed later in our commentary. The PFBC has been consistent in communicating our concerns to the Department. We recognize that the Department has

expended a great deal of effort to determine the stressors to the Smallmouth Bass population and overall fish community. The Department's increasing sampling efforts have been intensive and noteworthy. The PFBC suggests that perhaps no other river in the U.S. has received more attention from an environmental regulatory agency during that time period. Initially, there were numerous discussions with regard to sediment, nutrients, dissolved oxygen, and water temperature as potential stressors. The state and federal agencies involved in the CADDIS project exercised a great deal of professional objectivity to deliver results to the Department. The CADDIS conclusions pointed toward endocrine disrupting chemicals (EDCs) and herbicides along with pathogens and parasites as likely causes of the Smallmouth Bass decline. The effort to investigate and identify those parameters has been valuable. However, work remains to be done for the uncertain causes which include: Interspecific Competition, YOY Food Quality: thiaminase, Egg Quality, YOY Habitat, Temperature – Increased Disease, Dissolved Oxygen – Increased Disease, Algal & Bacterial Toxins.

Other agencies and universities including the United States Geological Survey, the Pennsylvania State University, and the Susquehanna River Heartland Coalition for Environmental Studies have been a part of the research effort and have contributed information during this period. In an effort to minimize stress from recreational fishing, the PFBC changed angling regulations as a mitigative measure to maintain and enhance the current Smallmouth Bass population. The PFBC also has support from the angling public and those Commonwealth residents and groups interested in the health of Susquehanna River through their monetary donations to our recent Save Our Susquehanna (S.O.S.) campaign. The PFBC has made and will continue to make every effort within our means to restore the Smallmouth Bass population and improve the health of the river.

Over this period, this issue has not been one of just local interest but also of national interest. In 2014, the Los Angeles Times printed a story describing the Susquehanna River and the ill health of the fishery. The article indicated that intersex fish were found in three rivers in Pennsylvania including the Susquehanna. The article referred to "the USGS research that indicated two fish species, Smallmouth Bass and White Sucker, were exhibiting intersex characteristics due to exposure to endocrine-disrupting chemicals — hormones and hormone-mimicking chemicals that caused the male fish to produce eggs". This was followed by a quote from Dr. Vicki Blazer who said, "the number of fish affected and the severity was surprising".

American Rivers in the America's Most Endangered Rivers® report has named the Susquehanna River the third most endangered river in the nation in 2016. The purpose of this designation is to "spotlight rivers facing urgent threats to call for change". American Rivers is a national organization with an extensive group of individuals with advanced academic degrees on its Science and Technical Board.

Our downriver neighbors are also interested in this decision. The Pennsylvania Director for the Chesapeake Bay Foundation (CBF) publicly supported an impairment designation for the Susquehanna River based on collective data. Each state in the Bay watershed has a responsibility to improve water quality within their individual jurisdiction. Collectively, for the six states and the District of Columbia in the Chesapeake Bay watershed, the first-ever analysis

just released by the CBF estimates that the economic benefits provided by implementation of the Clean Water Blueprint will total $130 billion annually.

We would like to point out some sections of the report deserving specific comment.

Page 33; paragraph 4 – Susquehanna River Recreational Use impairment

We note that the Department is beginning to assess waters for recreational impairment based on fecal coliform bacteria levels. Two small sections of the Susquehanna River from Conodoguinet Creek to Yellow Breeches Creek (4.0 miles) and a 1.2 mile section near the Route 462 Bridge in Columbia, Pennsylvania are listed as impaired. We appreciate that DEP is identifying such waters for the safety of recreational users and as noted in the final paragraph of this letter, believe it should be part of the 98 miles of Susquehanna River we propose to be impaired for aquatic life. The Department should re-examine the definition and the standards it uses to determine recreational use impairment since there should be no doubt that by public definition, the recreational fishing use of the river has been substantially harmed by the decline of the Smallmouth bass population. All one has to do is ask either Bob Clouser or Lefty Kreh, internationally recognized fishing guides and experts in freshwater recreational fishing.

Page 34; paragraph 4 – Large river assessment methodology and nuisance algae

We urge the Department to forge ahead with benthic macroinvertebrate and fish assessment methodologies for large rivers. PFBC would welcome the opportunity to participate with DEP in development of these methodologies and would like to see them included in the next triennial review process. Included in this should be development of methodology for assessing nuisance algae blooms as a means of determining recreational impairment. We are aware that West Virginia and Virginia are developing such methodology which would be extremely important to Pennsylvania anglers and boaters. This methodology could assess impairment based on recreational use using the frequency of nuisance algae blooms as previously recommended by PFBC staff (referenced on page 40, paragraph 5 of the report).

Additionally, the U.S. Environmental Protection Agency recognizes numeric nutrient criteria as a "critical tool for protecting and restoring a waterbody's designated uses related to nitrogen and phosphorus pollution". Twenty-seven other states throughout the country currently have at least partial nitrogen or phosphorous water quality criteria. Pennsylvania is one of the states with no nitrogen or phosphorus criteria. New Jersey, Florida, Wisconsin and Minnesota have been most progressive in development of statewide phosphorus criteria for rivers, streams, lakes, reservoirs and estuaries. New Maryland state regulations address manure application and use a Phosphorus Management Tool to identify areas where the soil is saturated with phosphorus and other factors that lead to high risk of phosphorus runoff. We believe nutrient criteria and management requirements go hand-in-hand with nuisance algae methodology development and much could be gained in following the example of other states to improve water quality. How can Pennsylvania expect to adequately protect a Great River like the Susquehanna and the Chesapeake Bay without an established criteria for nutrients? Perhaps that is one of the reasons why we lag behind our goals in reducing nutrients and sediments as required by the Bay TMDL.

Page 34; paragraph 4 – Susquehanna and large river aquatic life assessments

Lack of assessment of aquatic life for large rivers like the Susquehanna inhibits proper determination of condition and subsequent management. We disagree with statements here and on page 36, paragraph 1 that there were no exceedances of water quality criteria since 2012. There was documentation of several instances when criteria violated water quality criteria during that time frame; however, they did not meet DEP's 1% rule. When dissolved oxygen levels fall below the criteria to protect warm water fish (5.0 mg/l) during a critical time for a sensitive life stage of fish such as Young-of-Year Smallmouth Bass, an instantaneous response to these exceedances should be expected. Animals do not react to averages or exceedances 1% of the time, especially during critical times in isolated habitats such as the YOY microhabitats where DO levels have been measured below 3.0 mg/l. Therefore, we do not believe that the Department's generic 1% exceedance rule applies to the conditions we are evaluating in these specialized habitats in the Susquehanna River. To average an hour's, day's or week's exceedances with what occurs the rest of the day, week or year does not make ecological sense. Perhaps a redefinition of the 1% rule to look at local exceedances in these critical habitats would be more appropriate and used as the threshold measurement. I am certain that most humans could not hold our breath or struggle to breathe for 1% of the time without suffering health consequences or death.

In the absence of aquatic life assessments, we offer the same body of evidence we have presented to you and others that shows an unhealthy Smallmouth Bass population after 2005. I have presented this evidence in our agency's forums and we have gained significant public support for a conclusion that the Susquehanna River is impaired. Specifically, you can see that:

- Adult Smallmouth Bass are less abundant now than before 2005 (Figure 1)
- Young-of-year Smallmouth Bass index of abundance is much lower now than before 2002 (Figure 2)
- Incidence of diseased YOY Smallmouth Bass ranged from 10% to nearly 70% since 2005 (Figure 3)
- Illegal application of manure has been documented a number of times in tributaries affecting the middle and lower Susquehanna River during winter 2015-2016. (Figure 4)
- Diseased or dead fish have been commonly reported by anglers 2012-2015 (Figure 5) and in 2016 (Figure 6)
- Most frequent occurrence of diseased young-of-year Smallmouth Bass has been the middle and lower Susquehanna River (Figure 7)

We present this information as evidence that that the Susquehanna River is impaired for aquatic life from the confluence of the West Branch at Sunbury to Holtwood Dam.

Page 34; paragraph 5 – Tributary influences and impact to the Susquehanna River

The Department makes a concerted effort to describe influences of various source water as one progresses across the width of the Susquehanna River as detailed in Figure 3. Potential spatial impairment within these distinct water quality zones can uniquely affect aquatic life living there and should be assessed. We would consider areas directly influenced by impaired tributaries as the highest priority. DEP must focus on suspect tributaries and development of TMDLs and remediation activities in those watersheds. These tributaries are causing localized degradation of water quality much like point-source discharges and should be treated as such.

Identified tributaries in this reach should be designated as high-priority TMDLs, fast-tracking the remediation process. Adoption of phosphorus and nitrogen criteria and management requirements, as mentioned in the comment above, should be essential in assessment of tributary impacts to the Susquehanna and Juniata Rivers.

Page 36; second paragraph – Tributary emphasis

Since the Department has recognized the tributary impacts on localized water quality, we agree that there should be increased focus on assessing these tributaries so that a rapid response can be made and mitigation taken.

Page 36; third to fifth paragraphs – Action needed to address identified emerging contaminants

There is a continued emphasis on evaluating whether there is a link between certain compounds and Smallmouth Bass mortality. In our opinion the relationship between the two is less important than addressing an observed concern now that the presence of endocrine disrupting compounds and pesticides has been cited as the likely causes of the disease in YOY Smallmouth Bass. Documenting the presence of these compounds in and out of the Susquehanna Basin should raise a level of concern over the potential societal impacts they may cause. The Department should utilize all available data from across North America and Europe to begin development of aquatic life use criteria for the short list of herbicides and pesticides of concern. We would like to know the Department's time frame in which you believe this may be accomplished.

We strongly recommend that Pennsylvania DEP initiate an assessment of endocrine disrupting chemicals from the standpoint of management of known sources and determination of impacts. For example, Roundup^{TM} (active ingredient Glyphosate) and Atrazine are the two most widely applied herbicides in Pennsylvania. Glyphosate usage has increased more than 250 times in the United States over the last 40 years. Some of the carriers in this herbicide are potentially more harmful than the active ingredient. Atrazine is mobile in groundwater and has been found to cause reproductive disruption in amphibians. The PFBC has prohibited atrazine use for agriculture on leased fields our agency owns because of these reasons. Both herbicides are widely used in an area that has coincided with diseased bass (Figure 8). Coordination with the U.S. EPA in risk assessment of EDCs and research to document application rates, exposure and uptake by aquatic organisms in the Juniata and Susquehanna River is strongly recommended to further clarify impacts of this likely cause of Smallmouth Bass decline documented in the CADDIS report.

Page 37; fourth paragraph – remediation of impaired tributaries

We appreciate the Department's increased focus on developing new methodologies and moving assessments into the tributaries. Your emphasis on tributary evaluation and impairment listing is credible and we support those listings. We would like to see expedited remediation of the 30 tributaries identified as a high-priority moving forward. We would like to work with the Department in the remediation of high priority tributaries and believe the remediation work can be funded through available sources such as Growing Greener, PFBC's S.O.S. campaign, or new and expanded funding sources.

Page 38; second bullet – Disagreement with DEP's rationale on disease occurrence

DEP's statement that disease should be high in tributaries with higher concentrations of emerging contaminants is oversimplified. This statement fails to recognize the complex ecology of river systems and the multitude of factors that could potentially affect disease occurrence. Typically, Smallmouth Bass are less abundant and smaller in less productive tributaries. The suggested simple binomial relationship of higher concentration of contaminants leading to higher rates of disease statement overlooks the pathogen-environment-host relationship that must occur for a disease outbreak to occur. It is highly possible for one of those three elements to be missing from a system and as a result disease may not occur. This complexity is why solving this issue has been perplexing. Additionally, the PFBC has documented diseased Smallmouth Bass in a number of tributary systems over time; occasionally with similar disease prevalence as identified in the mainstem Susquehanna River.

Other report elements meriting comment include the following:

Pages 61-68 – Water quality trend analysis using two models

Water quality trends using the ESTIMATOR model and WRTDS model were presented. Description of inputs and assumptions was lacking. Table 12 shows outputs that varied widely from the ESTIMATOR model (improving, degrading and non-significant trends) to the WRTDS model (all but 1 parameter improving). After a discussion of how models and water quality parameters are adjusted to address discharge variation, the report states in the last paragraph of page 61 that the WRTDS model is superior**.** This conclusion was not explained or adequately justified. We request that this deficiency be addressed in the final report.

Page 67; Table 13 – Raystown Branch at Saxton zinc trends

Long and short term water quality trends modeled for the Raystown Branch Juniata River at Saxton, PA (Table 13, page 67) indicate a very large increasing trend for zinc. This metal can be toxic to aquatic life. The report lacks an explanation of this anomaly and the final report should correct this omission. We also request appropriate follow up action for this location by the Department.

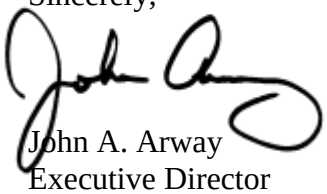
Appendix H- Streams, Cat. 5 Waterbodies, Pollutants Requiring a TMDL-303(d) Priority Waters

We noted with great interest that 153 stream segments in the Lower Susquehanna Basin and 40 stream segments in the Juniata River Basin are listed on the 303(d) list. This large number of impaired waters provides input to the Susquehanna River, which has been the water for which we have voiced concern.

Our position has not changed since I wrote a letter to DEP Secretary Michael Krancer on April 4 2012. Our agency continues to assert that the Susquehanna River is impaired for 98 miles from Sunbury to Holtwood Dam and should be included in Appendix H - Streams, Category 5 Waterbodies, Pollutants Requiring a TMDL-303(d) Priority Waters. There is no doubt that there is widespread support to improve and restore the health of this magnificent resource. But the fact remains that after 11 years of continuous work, there may not be a "smoking gun" or traditional departmental assessment data to determine impairment of aquatic life in the Susquehanna River. However, the PFBC believes that the body of evidence has been

presented to support such a decision. The PFBC strongly encourages the Department to reconsider its decision presented in the 2016 Draft Integrated Water Quality Monitoring and Assessment Report. An impairment decision will spur additional research, will provide a larger source of funding to solve this crisis, but most importantly, will start the clock on the preparation of a plan (TMDL) that will address the problems we continue to debate. We have tried to do our part by instituting catch-and-release regulations for bass on the middle and lower Susquehanna River plus the lower Juniata River from Port Royal to the mouth. We are starting to see some recovery in the bass fishery, but contend that the overall health of the Susquehanna River is still impaired based on bass abundance and disease occurrence. The Susquehanna River and its fish deserve the same attention and remedy. We continue to offer our full agency assistance, including staff and resources, to assist the Department in developing a final answer to the impairment question. Our bass, our anglers and boaters and the people of Pennsylvania not only deserve a final answer but our laws and Constitution require us to provide one before it is too late to solve the problems we all know exist.

Sincerely,



John A. Arway
Executive Director

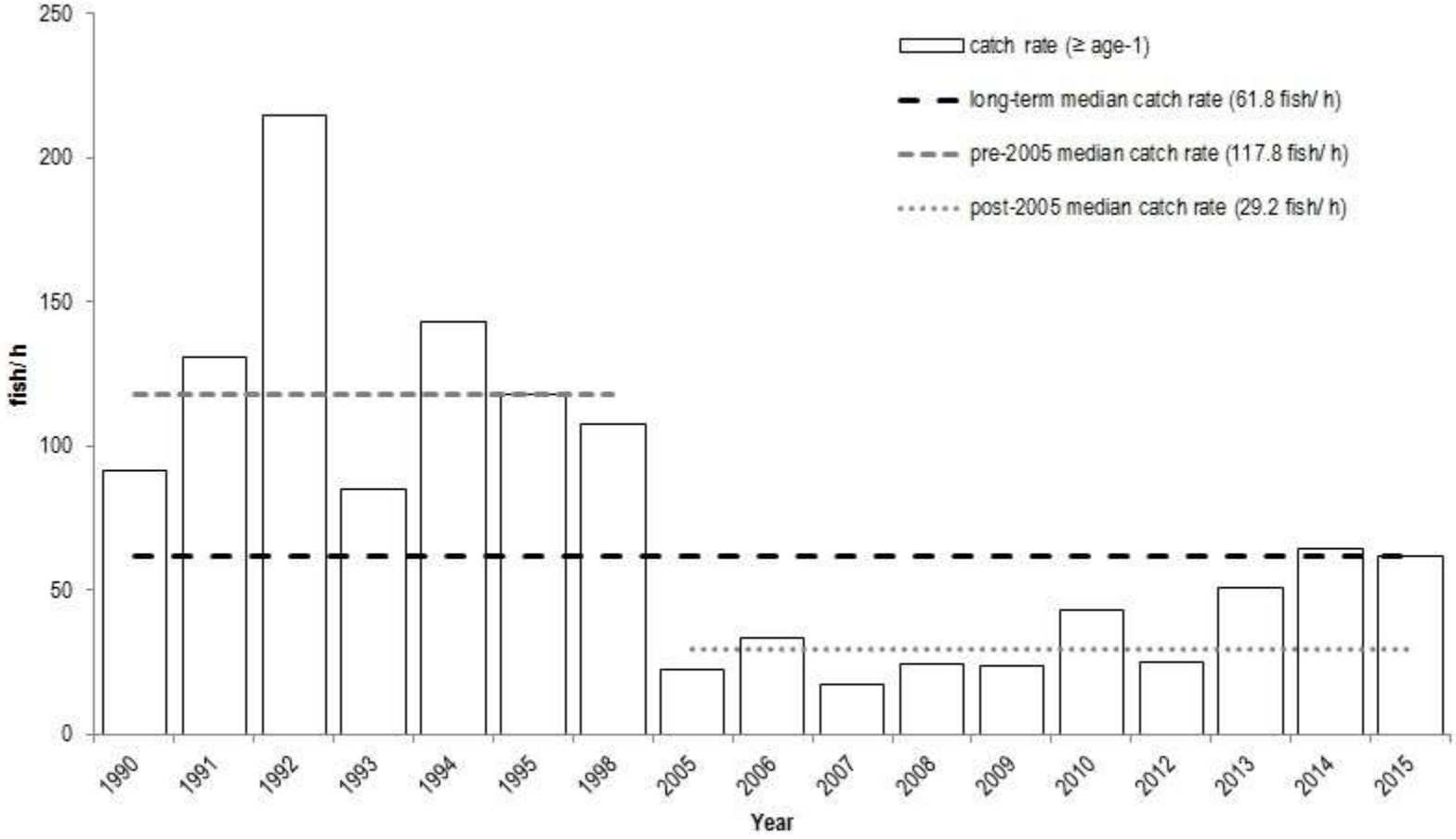


Figure 1: Boat electrofishing catch per unit effort (CPUE; fish/ h) of adult Smallmouth Bass (age-1 and older) at the Susquehanna River between Sunbury and York Haven, Pennsylvania.

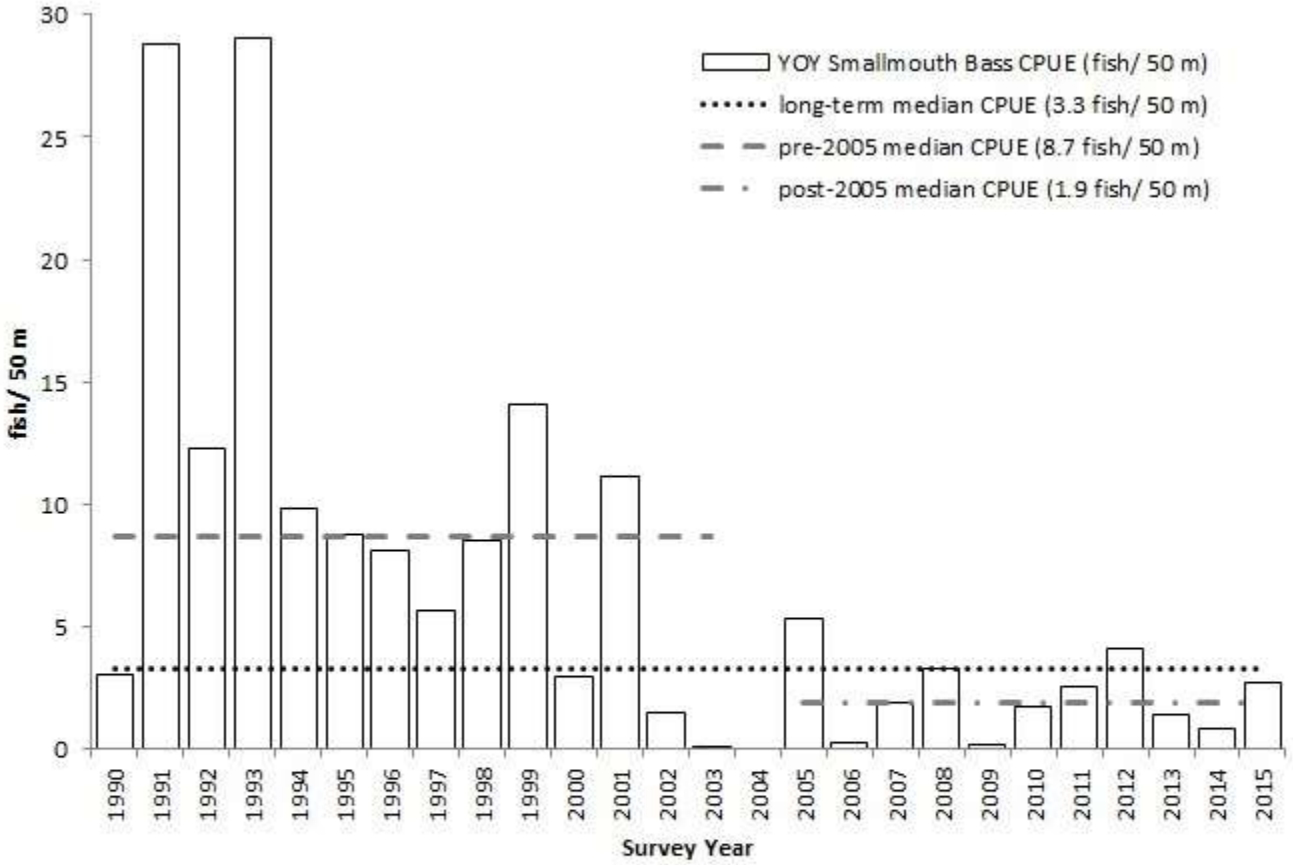


Figure 2: Backpack electrofishing catch per unit effort (CPUE; fish/ 50 m) of young-of-year Smallmouth Bass at the Susquehanna River between Sunbury and York Haven, Pennsylvania.

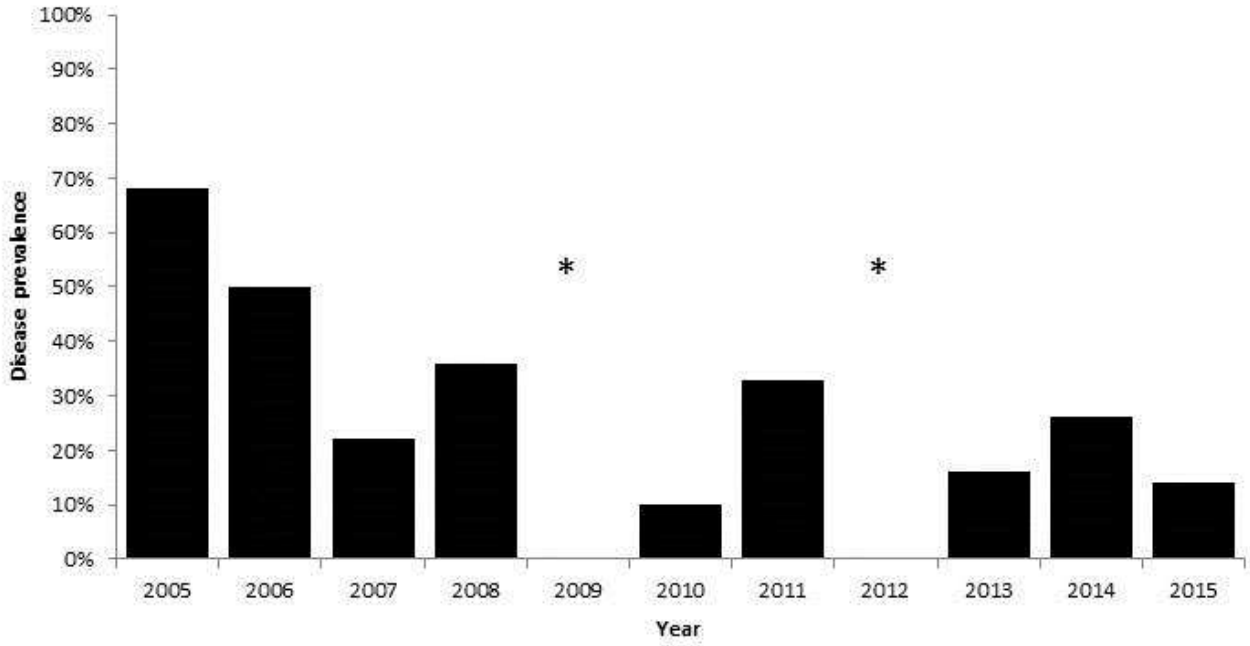


Figure 3: Proportion of young-of-year Smallmouth Bass with clinical sign of disease caught during backpack electrofishing surveys at the Susquehanna River between Sunbury and York Haven, Pennsylvania. Asterisks indicate years when onset of disease was outside of typical survey period and could not be quantified due to changes of capture efficiency of fish

Figure 4. Locations where Pennsylvania Fish and Boat Commission Waterways Conservation Officers or Biologists documenting illegal fertilizer spreading during winter 2015-2016.

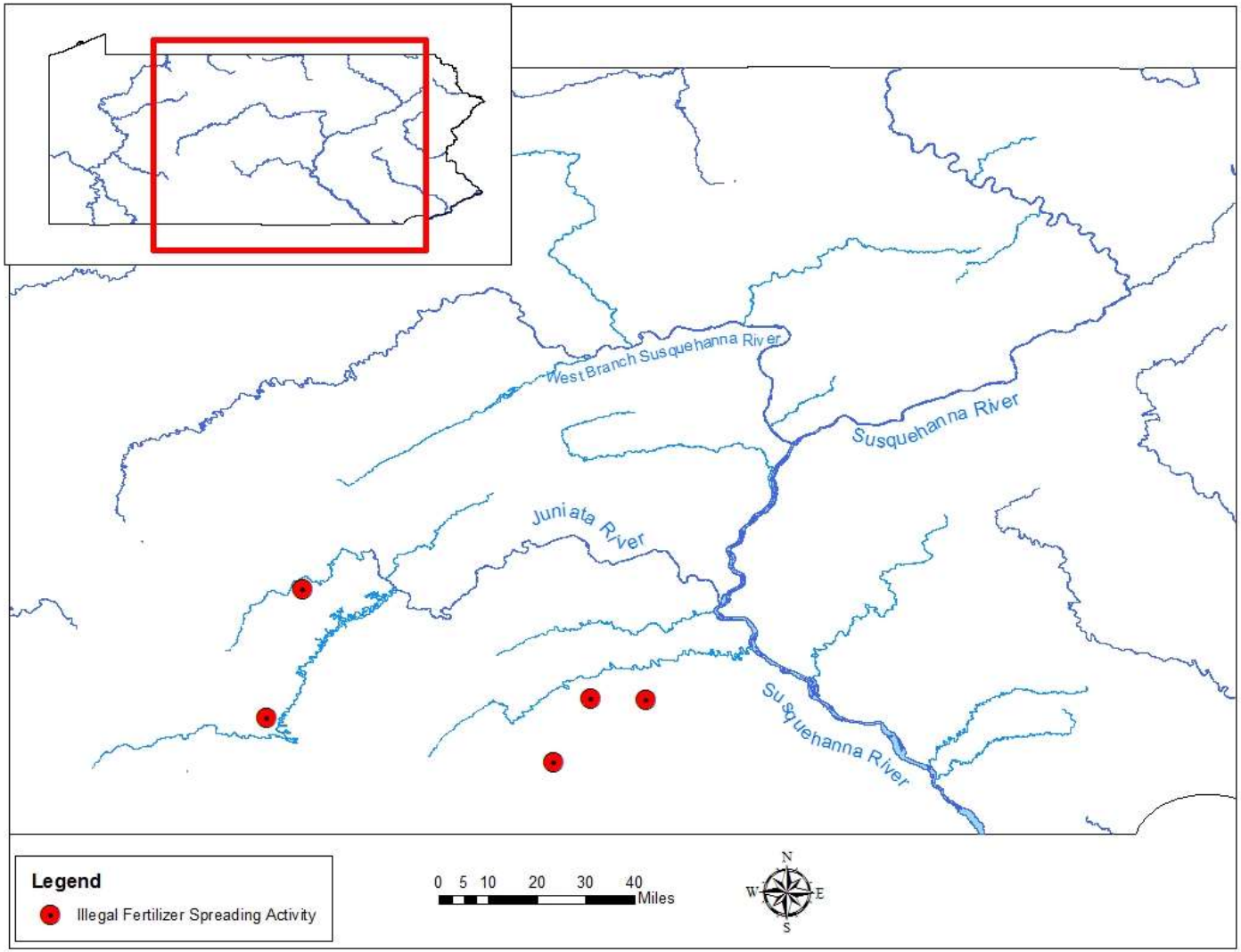


Figure 5. Location and condition of fish reported by angler and the public with physical anomalies throughout the Commonwealth 2012 - 2015.

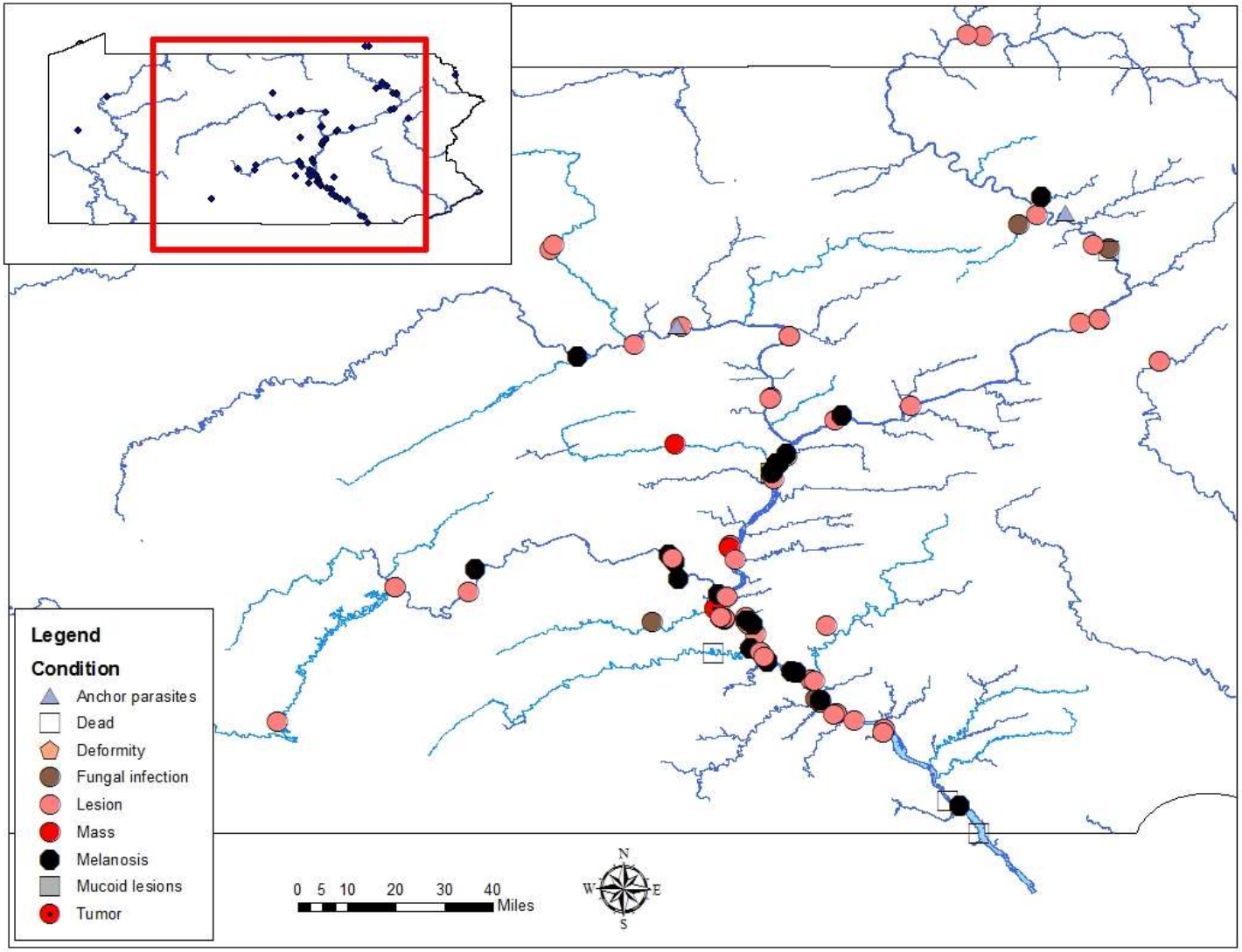


Figure 6. Location and condition of fish reported by angler and the public with physical anomalies throughout the Commonwealth through early August 2016.

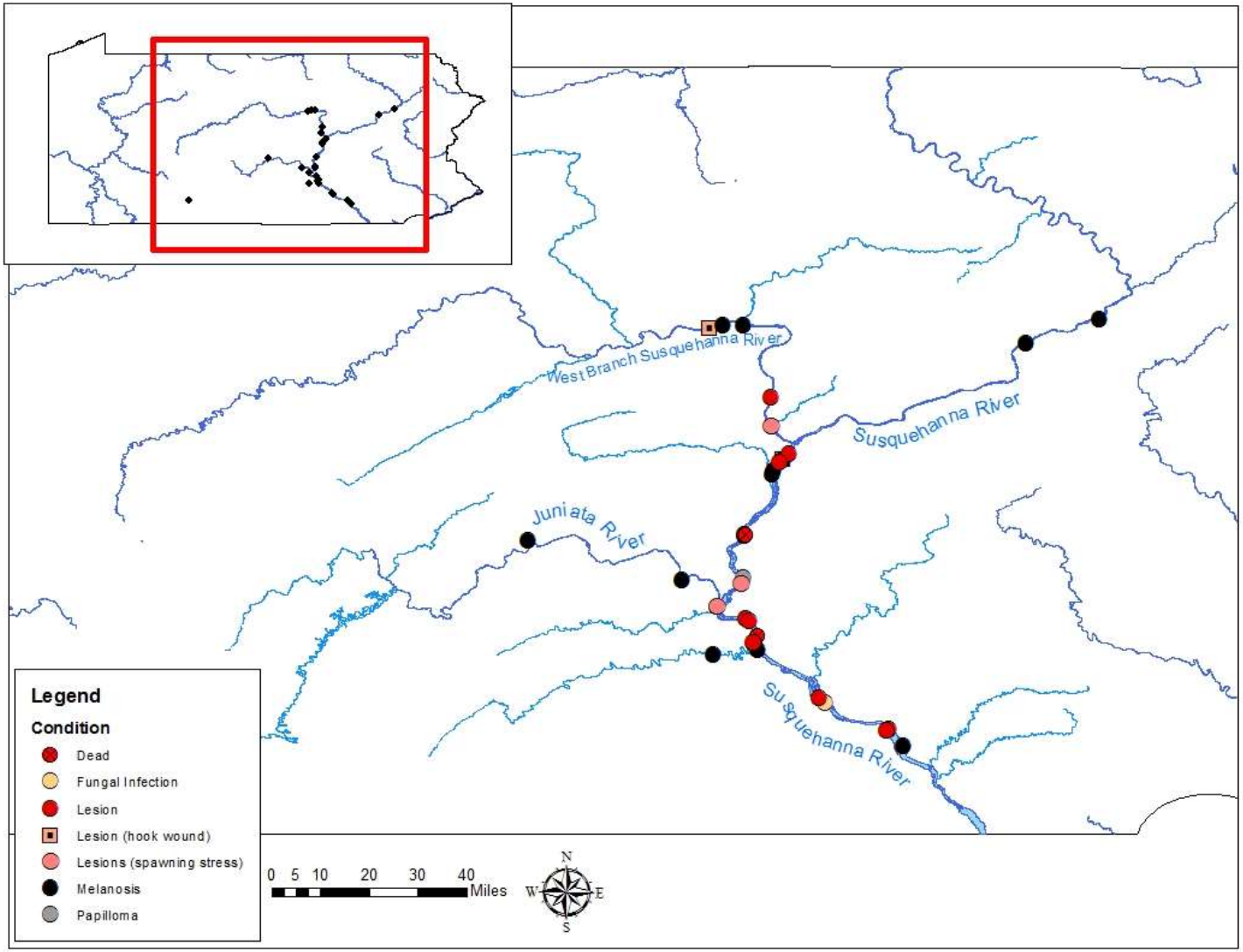


Figure 7. Number of occasions that YOY Smallmouth Bass with clinical signs of disease were documented at each of the YOY Smallmouth Bass survey locations in Pennsylvania between 2005 and 2014. Not all locations were sampled with the same frequency during the time frame.

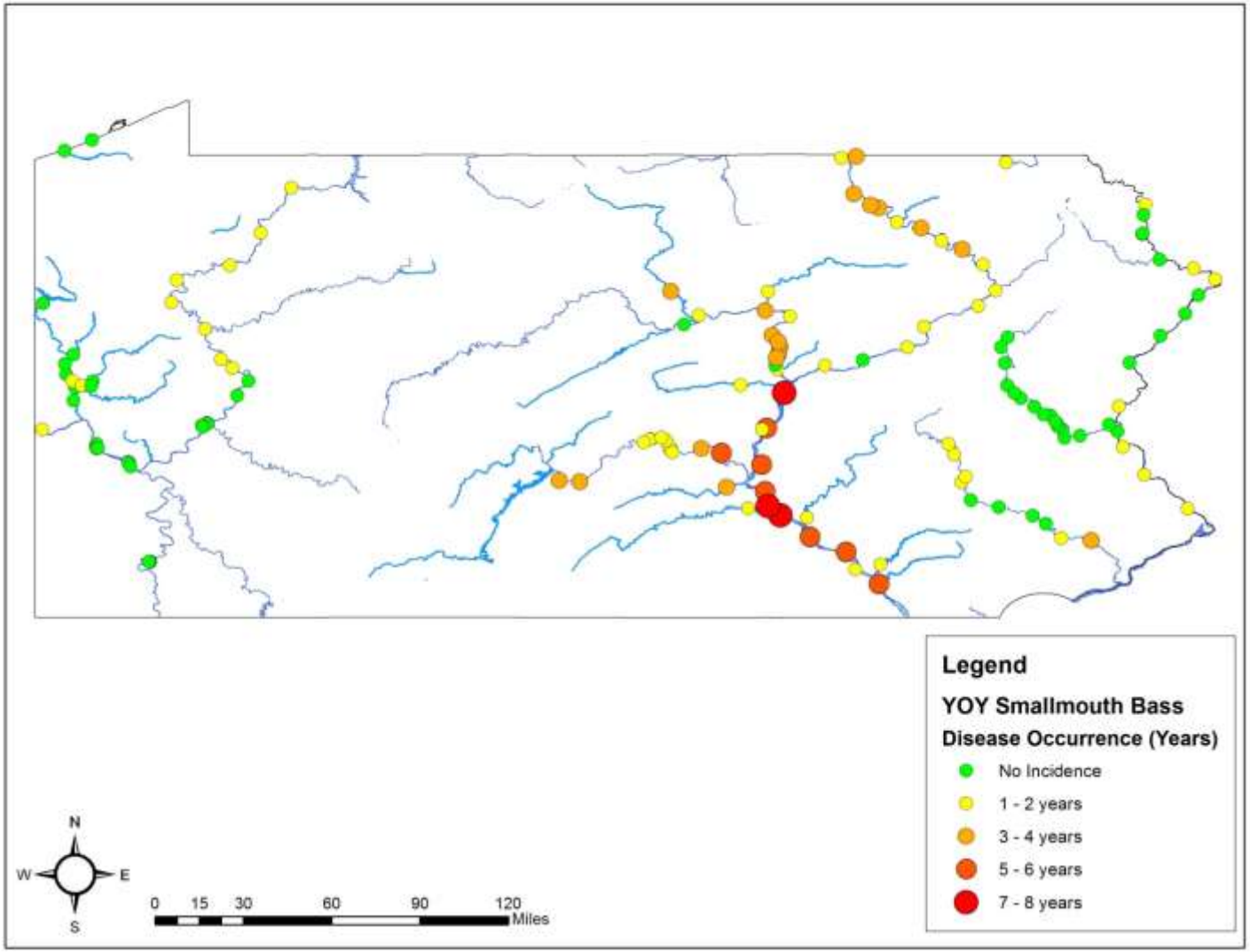
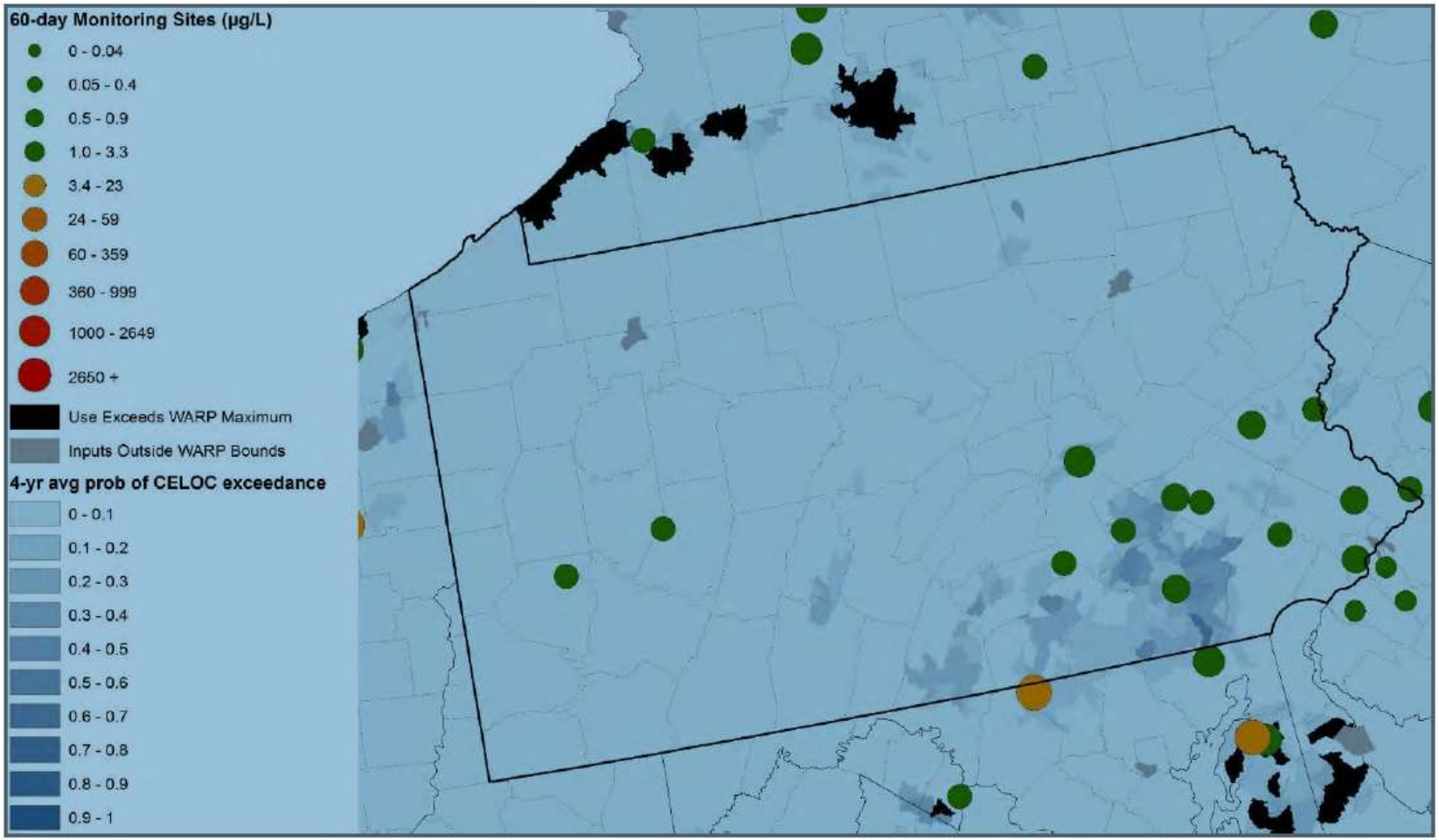


Figure 8. U.S. EPA map of atrazine monitoring points and modeled probability of Concentration Equivalent Level of Concern (CE-LOC) exceedances for Pennsylvania.



Online source (September 7, 2016) https://www.regulations.gov/document?D=EPA-HQ-OPP-2013-0266-0315