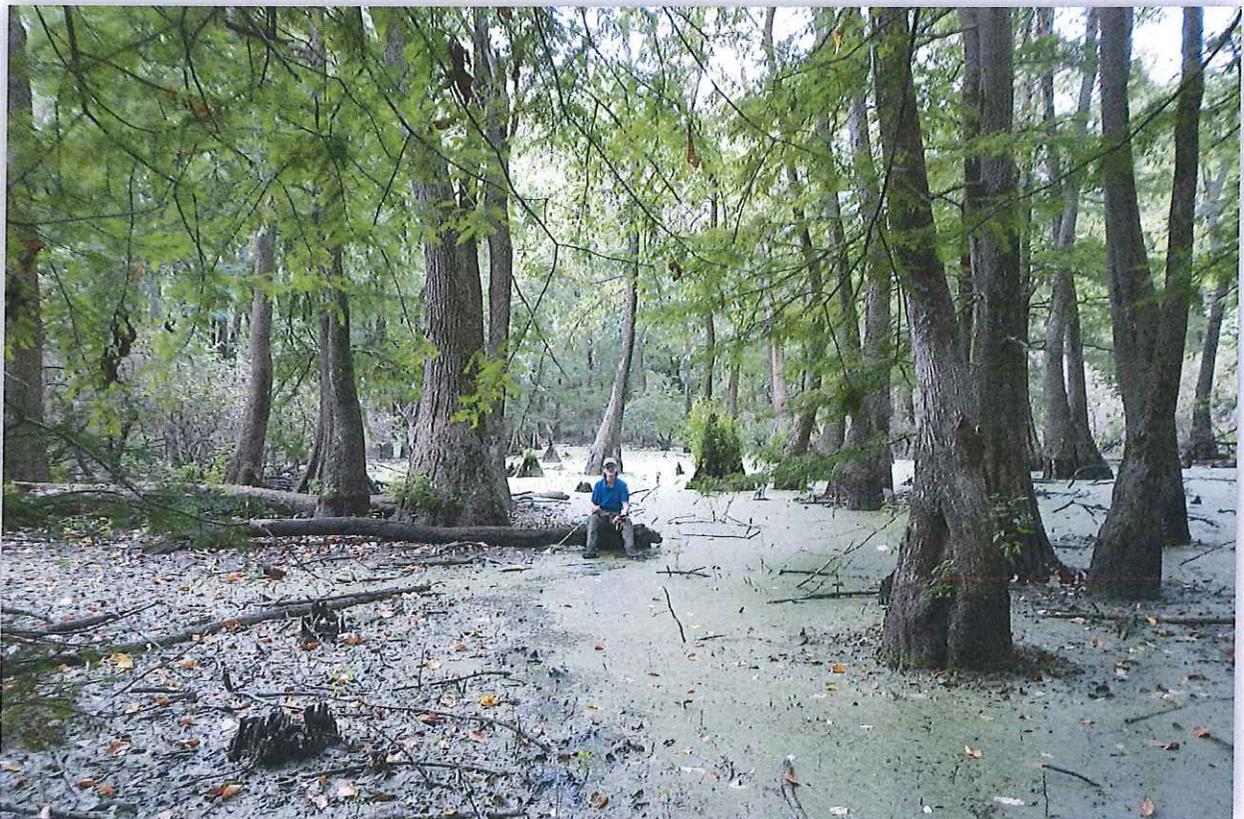


Kentucky Division of Water
Wetland Program Plan

2015 – 2018



Axe Lake, Ballard County (Photo by Lisa Hicks)

January 2015

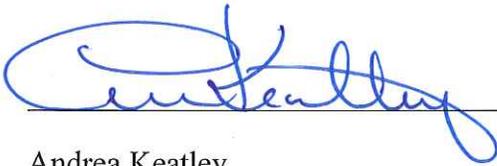
Kentucky Division of Water
Wetland Program Plan

Funded by U.S. EPA Wetland Program Development Grant CD 00D08913

Primary Contact: Barbara Scott

(502) 564-3410 / Barbara.Scott@ky.gov

January 2015



Andrea Keatley

Water Quality Branch Manager

Director, Division of Water

1/12/2015

Date

Thomas McGill

Chief, EPA Ocean, Wetlands and Streams

Protection Branch

Date

Table of Contents

Introduction.....	4
Monitoring and Assessment.....	6
Monitoring and Assessment Objectives, Actions, and Activities.....	8
Monitoring and Assessment: Timeline of Activities	9
Regulatory Program.....	10
Regulatory Program: Objectives, Actions, and Activities.....	11
Regulatory Program: Timeline of Activities.....	12
Water Quality Standards for Wetlands	13
WQS for Wetlands: Objectives, Actions, and Activities.....	14
WQS for Wetlands: Timeline of Activities	14
Voluntary Restoration and Protection.....	15
Voluntary Restoration and Protection: Timeline of Activities	16
Appendix A. List of acronyms.....	17
Bibliography	18



Marbled salamander (Photo by Rob Denton)

Introduction

It has been estimated that Kentucky has lost about 81% of its original 1.5 million acres of wetlands, putting it into the top 10 states with the most wetland acreage by percent lost (Dahl, 1990). The 1981 National Wetland Inventory (the most recent for Kentucky) reported approximately 300,000 acres of remaining, or 1.2% of Kentucky's total acreage (Dahl and Johnson, 1991). Kentucky has lost its historical wetland areas through fill, drainage, and transformation due to agriculture, urbanization, transportation, logging, and other commercial uses. We suspect that the function and quality of the remaining wetlands are often impaired.

Kentucky's remaining wetlands vary throughout the state in composition and size. Most of the state's wetlands are classified as palustrine forested wetlands and are associated with streams and reservoirs (Dahl and Johnson, 1991). The largest acreage of wetlands occurs in western Kentucky, along the Mississippi and lower Ohio rivers. The far western areas along the Mississippi are part of the avian Mississippi flyway and provide important wintering waterfowl habitat. These wetlands are typically bottomland forests dominated by water-tolerant oaks, tupelo, and cypress. Some are associated with Special Use Waters, including Reelfoot Lake, Murphy's Pond, Obion Creek, Swan Pond, and Bayou de Chien. Moving eastward, the remainder of Kentucky's wetlands is smaller in acreage and vary from bottomland hardwoods to emergent wetlands, including the less common vernal pools, seeps, flat hardwoods, large river sloughs, and plugged sinkholes.

While the Clean Water Act (CWA) does not specifically mention wetlands, its principal objective is to restore and maintain the chemical, physical, and biological integrity of the nation's waters (33 U.S.C. §§1251-1387). In Kentucky, the Department of Environmental Protection, Division of Water, currently monitors and derives assessments of designated use support for rivers, streams, lakes, and reservoirs for CWA goals and other purposes. There is currently no comparable monitoring and assessment program for Kentucky's wetland resources, even though wetlands are waters of the State by regulatory definition. The water quality certification program in the Division of Water has received several Wetland Program Development Grants and a portion of Section 106 funding from the United States Environmental Protection Agency (U.S. EPA) to develop an ambient water quality monitoring program. The results from those efforts will be explained in more detail later in this document. However, a strategic wetland monitoring and assessment program framework has not been developed or outlined. This Wetland Program Plan (WPP) serves as an initial statewide wetlands monitoring and assessment program plan for Kentucky.

Kentucky's Wetland Program Plan for the years 2015 – 2018 addresses the four elements of the U.S. EPA's *Core Elements of an Effective State and Tribal Wetlands Program Framework*:

Monitoring and Assessment, Regulation, Water Quality Standards for Wetlands, and Voluntary Restoration and Protection (U.S.EPA, Core Elements of an Effective State and Tribal Wetlands Program Framework, 2008). It is our intent to use this plan as a framework to develop our program capacity as financial resources allow. More importantly, we intend to use this plan to fulfill the Division of Water's mission to manage, protect, and enhance the water resources of the Commonwealth for present and future generations through voluntary, regulatory, and educational programs.



Booth Pond, Menifee County (Photo by Rob Denton)

Monitoring and Assessment

Consistent, thorough, and timely wetland monitoring and assessment programs are a critical tool for states and tribes to better manage and protect their wetland resources. These programs allow states and tribes to 1) establish a baseline in wetlands extent, condition, and function, 2) detect change, and 3) characterize trends over time (U.S.EPA, Monitoring and Assessment).

Kentucky's monitoring and assessment program will need to initially focus on assessing and establishing characteristics of its wetland resources before developing wetland-specific water quality standards and designated uses. In this early stage, the program will develop and define measurements, observations, and indices required to make these assessments. Ideally, an up-to-date inventory of wetland resources would be considered an essential tool for an effective monitoring and assessment program because it provides baseline information. However, wetland mapping is very expensive and will not be a primary focus of our initial efforts. Using the existing 1980s-era National Wetland Inventory maps, a probabilistic-based assessment of the state's wetlands can be initiated and subsequently expanded as resources allow. The wetland monitoring and assessment program will eventually be integrated with existing management plans and processes regarding surveys of wadeable streams, rivers, and lakes in a revolving sequence and be used for 305(b) and 303(d) Integrated Report goals and other purposes. The purpose of these surveys will be to generate statistically-valid and environmentally relevant reports on the condition of the states wetland resources and further inform decision-making on how to better protect, maintain, and restore water quality to the state's aquatic resources.

To date, Kentucky's primary efforts have been to develop a rapid wetland assessment, KY-WRAM. A Technical Work Group was formed in 2010 and consists of representatives from the U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, U.S. Forest Service, Natural Resource Conservation Service, Kentucky State Nature Preserves Commission, Kentucky Fish and Wildlife, Kentucky Department of Natural Resources, and Eastern Kentucky University. After much work, we have produced a final draft method and guidance manual. Using the method, we have conducted a statewide ambient survey on over 300 wetlands and are currently evaluating the data for completeness and defensibility. Vegetation and amphibian indices of biotic integrity have been developed and are nearly ready for use; macroinvertebrate and avian indices hold promise for future development.

Other efforts included participation in the 2011 National Wetland Condition Assessment, which gave us valuable experience in conducting wetland assessments. The techniques and conceptual approach used in the national assessment will provide the basis for further work in Kentucky. In addition, we supported an Eastern Kentucky University pilot project to create a model for wetland mapping using remote sensing, consulted with the Kentucky State Nature Preserves Commission on reference candidate wetlands, and began investigating acoustic monitoring for

birds and anurans with the U.S. Forest Service. We are also hoping to use unmanned aerial vehicles to assist with reconnaissance, data collection, and mapping.

Using the structure of the U.S. EPA's Program Building Activities Menu (U.S.EPA, Monitoring and Assessment), we have constructed charts listing our objectives, actions, and activities for Kentucky's monitoring and assessment strategy. For a list of acronyms and their meaning, see Appendix A.



Spoonleaf Sundew, *Drosera intermedia*. Hazeldell Wet Meadow, Pulaski County (Photo by Sarah Atherton)

Monitoring and Assessment Objectives, Actions, and Activities

Objective 1. Develop a monitoring and assessment strategy consistent with *Elements of a State Water Monitoring and Assessment Program for Wetlands* (U.S.EPA, Core Elements of an Effective State and Tribal Wetlands Program Framework, 2008).

Actions	Menu of Activities
A. Develop monitoring design	<ol style="list-style-type: none"> 1. Determine scope of effort. 2. Identify and organize all existing data. 3. Determine data needs and uses. 4. Determine assessment approach to meet objectives. 5. Determine sources from which sites will be selected.
B. Select a core set of indicators to represent wetland condition or suite of functions	<ol style="list-style-type: none"> 1. Review 2011 NWCA technical report and identify core indicators. 2. Select field methods. Use IBIs if they are ready. 3. Investigate acoustic monitoring. 4. Investigate use of UAVs for mapping and data collection.

Objective 2. Implement a sustainable monitoring program consistent with the wetlands monitoring strategy.

Actions	Menu of Activities
A. Ensure the scientific validity of field and laboratory activities	<ol style="list-style-type: none"> 1. Draft and peer review QMP. 2. Draft and peer review QAPPs. 3. Draft and peer review FOM.
B. Monitor wetland resources	<ol style="list-style-type: none"> 1. Form team and train staff. 2. Develop an annual & long-term schedule. 3. Collect data. 4. Participate in 2016 NWCA. 5. Conduct intensification of 2016 NWCA. 6. Fill KY-WRAM data gaps.
C. Establish reference condition.	<ol style="list-style-type: none"> 1. Evaluate KY-WRAM data to define gradient. 2. Define reference condition. 3. Determine process for measuring reference standard condition. 4. Select reference sites.
D. Track monitoring data in KWADE	<ol style="list-style-type: none"> 1. Develop KWADE module for wetlands. 2. Develop unique identifier system. 3. Input all wetland data into KWADE.
E. Analyze monitoring data to evaluate wetland extent and condition/function to inform decision making.	<ol style="list-style-type: none"> 1. Document data analysis and assessment procedures. 2. Continue to develop IBIs. 3. Establish baseline wetland condition. 4. Analyze changes relative to reference conditions. 5. Report regularly on the IR.

Monitoring and Assessment: Timeline of Activities

Activity	2015	2016	2017	2018
1A1. Determine scope of effort.				
A2. Identify and organize all existing data.				
A3. Determine data needs and uses.				
A4. Determine assessment approach.				
A5. Determine site selection sources.				
1B1. Review 2011 NWCA technical report & ID core indicators.				
B2. Select field methods. Use IBIs if they are ready.				
B3. Investigate acoustic monitoring.				
B4. Investigate UAVs for mapping and data collection.				
2A1. Draft and peer review QMP.				
A2. Draft and peer review QAPPs.				
A3. Draft and peer review Field Operations Manual.				
2B1. Form team and train staff.				
B2. Develop a schedule (annual & long-term).				
B3. Collect data.				
B4. Participate in 2016 NWCA (Recon and site assessment).				
B5. Conduct intensification of 2016 NWCA.				
B6. Fill KY-WRAM data gaps.				
2C1. Evaluate KY-WRAM data to define gradient.				
C2. Define reference condition.				
C3. Determine process for measuring reference standard condition.				
C4. Select reference sites.				
2D1. Develop KWADE module for wetlands.				
D2. Develop unique identifier system.				
D3. Input all wetland data into KWADE.				
2E1. Document data analysis and assessment procedures.				
E2. Continue to develop IBIs.				
E3. Establish baseline wetland condition.				
E4. Analyze changes relative to reference conditions.				
E5. Report regularly on the IR.				

Regulatory Program

Kentucky utilizes state water quality regulations and CWA §401 as the regulatory mechanism for the management and protection of wetlands. Kentucky relies on water quality certification of federal permits and licenses as the sole wetland regulatory mechanism at the state level and has not adopted mitigation provisions beyond what is required under CWA §404. In Kentucky, the Department of Environmental Protection, Division of Water administers the state's water quality certification (WQC) program.

Wetlands are defined in Kentucky's regulations similarly to federal regulations: "...land that has a predominance of hydric soils and that is inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of hydrophytic vegetation typically adapted for life in saturated soil condition." (KAR 401 10:002). However, the regulations are silent on what this means exactly, but it is generally recognized that the definition is at least as inclusive as the CWA. Therefore, the water quality certification program regulates water bodies that are jurisdictional under CWA §404. The WQC program also relies on water quality standards that are not wetland specific, and because there are few programmatic regulations, the U.S. Army Corps of Engineers by default is the lead agency for wetland regulation.

Kentucky recognizes the need to promulgate specific WQC regulations in order to adequately protect the commonwealth's aquatic resources. It has been a long-time goal of the Division administration to develop regulations, but at the present time it is not being pursued. As it awaits direction in this area, the WQC program has developed a rapid wetland assessment method for evaluating the quality of wetlands under its review (see the Monitoring and Assessment section above). The rapid assessment, KY-WRAM, will be used to support avoidance and minimization, determine mitigation ratios (presently based on area alone), and evaluate mitigation projects. The assessments to support the KY-WRAM development have been conducted on over 300 wetlands of varying quality across the entire state, and it is now possible to develop categories for the scores. Investigations have confirmed that KY-WRAM can be used year-round in Kentucky without a significant difference in the final score. Current efforts also underway include developing mitigation ratios, as well as training and getting feedback from environmental consultants. These efforts are now being conducted by the wetland programs coordinator under the Water Quality Branch Manager.

Using the structure of the U.S. EPA's Program Building Activities Menu (U.S. EPA, Monitoring and Assessment), we have constructed charts listing our objectives, actions, and activities for enhancing Kentucky's WQC regulatory program. For a list of acronyms and their meaning, see Appendix A.

Regulatory Program: Objectives, Actions, and Activities

Objective 1. Incorporate monitoring data into agency decision making.

Actions	Menu of Activities
A. Ensure impact assessments and mitigation crediting lead to replacement of aquatic resources.	<ol style="list-style-type: none"> 1. Develop site selection guidance for wetland mitigation. 2. Update success criteria for wetland mitigation. 3. Implement KY-WRAM in 404/401 programs. 4. Train KY-WRAM users. 5. Evaluate wetland mitigation methods to determine functional replacement. 6. Evaluate post-release mitigation sites for long-term function.
B. Improve site-specific management of wetland resources.	<ol style="list-style-type: none"> 1. Incorporate monitoring & assessment into restoration techniques. 2. Add wetland BMP to Agricultural Water Quality Plan. 3. Use monitoring & assessment to inform WQC decisions.

Objective 2. Perform public education and outreach.

Actions	Menu of Activities
A. Perform public education and outreach.	<ol style="list-style-type: none"> 1. Develop “wetland school” as diversion program for WQC enforcement. 2. Implement communication plan for social media. 3. Develop wetlands web page.

Regulatory Program: Timeline of Activities

Activity	2015	2016	2017	2018
1A1. Develop site selection guidance for wetland mitigation.				
A2. Update success criteria for wetland mitigation.				
A3. Implement KY-WRAM in 404/401 programs.				
A4. Train KY-WRAM users.				
A5. Evaluate wetland mitigation methods to determine functional replacement.				
A6. Evaluate post-release mitigation sites for long-term function.				
1B1. Incorporate monitoring & assessment into restoration techniques.				
B2. Add wetland BMP to Agricultural Water Quality Plan.				
B3. Use monitoring & assessment to inform WQC decisions.				
2A1. Develop “wetland school” for WQC enforcement alternative.				
A2. Implement communication plan for social media.				
A3. Develop wetland program web page.				



KY-WRAM training (Photo by Michelle Guidugli)

Water Quality Standards for Wetlands

Section 101(a) of the Clean Water Act states the objective of the Act is to “restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.” No distinctions were made in the 1972 Act between wetlands and other waters, yet only 14 states to date have developed water quality standards specifically for wetlands (ASWM). Wetlands differ from streams and lakes in many ways. They are more sensitive to small hydrological changes. Stopping impacts such as draining or filling may not restore original functions in wetlands, unlike stopping the addition of pollutants to streams. Wetlands can actually improve the water quality of hydrologically-connected streams and lakes by acting as sinks or transformers of pollutants, whereas the reverse is not always true. Even within individual wetlands, basic characteristics such as water chemistry, biotic assemblages, and hydrology can be quite variable (Christie and Kusler, 2012). Given these challenges, it is not surprising that so few states have promulgated water quality standards for wetlands.

According to U.S. EPA (U.S. EPA), the basic requirements for applying state water quality standards to wetlands include the following:

- Include wetlands in the definition of “state waters.”
- Designate uses for all wetlands.
- Adopt appropriate numeric criteria for wetlands.
- Adopt narrative biological and aesthetic criteria for wetlands.
- Apply the state’s antidegradation policy and implementation methods to wetlands.

Kentucky does include wetlands in its definition of “state waters.” Under Kentucky’s environmental protection statute, “water” or “waters of the Commonwealth” include “any and all rivers, streams, creeks, lakes, ponds, impounding reservoirs, springs, wells, marshes, and all other bodies of surface or underground water, natural or artificial, situated wholly or partly within or bordering upon the Commonwealth or within its jurisdiction.” (KRS 224.01-010(33)).

The regulatory definition for “surface waters” is:

“those waters having well-defined banks and beds, either constantly or intermittently flowing; lakes and impounded waters; marshes and wetlands; and any subterranean waters flowing in well-defined channels and having a demonstrable hydrologic connection with the surface. Effluent ditches and lagoons used for waste treatment which are situated on property owned, leased, or under valid easement by a permitted discharger are not considered to be surface waters of the commonwealth” (401 KAR 5:002 (160)).

This is a good start. But in order to develop wetland-specific water quality standards, Kentucky will need to spend considerable effort over the next four years laying the groundwork upon which the standards will be based. Actual adoption and incorporation into agency decision making is beyond the scope of this plan.

Using the structure of the EPA’s Program Building Activities Menu (U.S. EPA, Monitoring and Assessment), we have constructed charts listing our objectives, actions, and activities for continuing the development of Kentucky’s wetland-specific water quality standards. For a list of acronyms, see Appendix A.

WQS for Wetlands: Objectives, Actions, and Activities

Objective 1. Develop wetland-specific water quality standards.

Actions	Menu of Activities
A. Gather and analyze monitoring data that will become the basis of water quality standards.	1. Define wetland types/classes.
	2. Develop technical document that supports narrative and numerical criteria.
	3. Establish reference condition.
B. Establish appropriate wetland-specific designated uses.	1. Establish designated uses for different wetland types.
	2. Map where designated uses apply.
C. Establish narrative criteria.	1. Establish narrative physical criteria.
	2. Establish narrative biological criteria.
D. Establish numerical criteria	1. Establish numeric criteria for biological attributes.
	2. Establish numeric criteria for chemical constituents.
	3. Establish numeric criteria for physical parameters.

WQS for Wetlands: Timeline of Activities

Activity	2015	2016	2017	2018
1A1. Define wetland types/classes.				
A2. Develop technical document that supports narrative and numerical criteria.				
A3. Establish reference condition.				
1B1. Establish designated uses for different wetland types.				
B2. Map where designated uses apply.				
1C1. Establish narrative physical criteria.				
C2. Establish narrative biological criteria.				
1D1. Establish numeric criteria for biological attributes.				
D2. Establish numeric criteria for chemical constituents.				
D3. Establish numeric criteria for physical parameters.				

Voluntary Restoration and Protection

The Kentucky Division of Water does not have any programs that voluntarily restore and/or protect wetlands. However, we do think it is important to increase the acreage of functioning wetlands as well as reduce wetland loss through protective measures.

We plan to support other governmental entities, such as the Kentucky Department Fish and Wildlife, Kentucky State Nature Preserves Commission, and U.S. Fish and Wildlife in their efforts. Some local governments are restoring or creating riparian wetlands to improve water quality, and the University of Louisville’s Stream Institute is incorporating wetlands into their stream restoration projects. Non-governmental organizations, including Ducks Unlimited, The Nature Conservancy, and the Boone County Conservancy could also be good partners, as conserving wetlands is one way to achieve their missions. It has been suggested that bourbon distilleries, which have a stake in clean water, might be willing to restore and protect wetlands.

Using the structure of the EPA’s Program Building Activities Menu (U.S. EPA, Monitoring and Assessment), we have constructed charts listing our objectives, actions, and activities for voluntary restoration and protection. For a list of acronyms and their meaning, see Appendix A.

Objective 1. Assist stakeholders with their restoration and protection goals

Actions	Menu of Activities
A. Establish partnerships to leverage additional protection.	<ol style="list-style-type: none"> 1. Share location and condition information of high-quality wetlands with KSNPC, USFS, KDFWR, & USFWS. 2. Form reciprocity agreements with above agencies. 3. Work with corporate, governmental, and NGO partners to protect/restore wetlands.
B. Provide clear guidance on appropriate restoration and management techniques and success measures.	<ol style="list-style-type: none"> 1. Develop restoration and management guidance specific to wetland types and location. 2. Establish performance standards based on reference wetland site in a relatively undisturbed condition.

Voluntary Restoration and Protection: Timeline of Activities

Activity	2015	2016	2017	2018
1A1. Share location and condition information of high-quality wetlands with other resource agencies.				
A2. Form reciprocity agreements with above agencies.				
A3. Work with corporate, governmental, and NGO partners to protect/restore wetlands.				
1B1. Develop voluntary restoration and management guidance specific to wetland types and location.				
B2. Establish performance standards based on reference wetland site in a relatively undisturbed condition.				



2011 NWCA – Soil assessment (Photo by Susan Cohn)

Appendix A. List of acronyms

BMP	Best Management Practices
CWA	Clean Water Act
EPA	United States Environmental Protection Agency
FOM	Field Operation Manual
IBI	Index (Indices) of Biological Integrity
ID	Identify
IR	Integrated Report
KAR	Kentucky Administrative Regulations
KDFWR	Kentucky Department for Fish and Wildlife Resources
KRS	Kentucky Regulatory Statutes
KSNPC	Kentucky State Nature Preserves Commission Kentucky Water Assessment Database for Environmental Sampling
KWADE	
KY-WRAM	Kentucky Wetland Rapid Assessment Method
NGO	Non-governmental Organizations
NWCA	National Wetland Condition Assessment
QAPP	Quality Assurance Project Plan
QMP	Quality Management Plan
UAV	Unmanned Aerial Vehicle
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
WPP	Wetland Program Plan
WQC	Water Quality Certification

Bibliography

- ASWM. (n.d.). *States with Wetlands and Water Quality Standards*. Retrieved November 18, 2014, from ASWM web site: <http://aswm.org/wetland-programs/water-quality-standards-for-wetlands/2780-states-with-wetlands-and-water-quality-standards->
- Christie, J. K and J. Kunsler (2012). *State Water Quality Standards for Wetlands, Revised Draft 2*. Association of State Wetland Managers.
- Dahl, T. (1990). *Wetland losses in the United States 1780s to 1980s*. Washington, D.C.: U.S. Fish and Wildlife Service.
- Johnson, T. D. (1991). *Wetlands - Status and trends in the conterminous United States, mid-1970s to mid-1980s*. Washington, D.C.: U.S. Fish and Wildlife Service.
- U.S.EPA. (2008). *Core Elements of an Effective State and Tribal Wetlands Program Framework*. Retrieved November 13, 2014, from Water: Wetlands: http://water.epa.gov/grants_funding/wetlands/cef_full.cfm
- U.S.EPA. (n.d.). *Monitoring and Assessment*. Retrieved November 21, 2014, from http://water.epa.gov/grants_funding/wetlands/monitoring.cfm
- U.S. EPA. (n.d.). *National Guidance Water Quality Standards for Wetlands*. Retrieved November 18, 2014, from USEPA website: <http://water.epa.gov/lawsregs/guidance/wetlands/quality.cfm>