Kentucky's Wetland Program Plan
2020 – 2024

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Kentucky's Wetland Program Plan: 2020-2024

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Kentucky's Wetland Program Plan: 2020-2024

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Kentucky's Wetland Program Plan: 2020-2024

Introduction

The mission of the Kentucky Department for Environmental Protection (DEP) is to protect and enhance Kentucky's environmental resources. The Kentucky DEP's Division of Water (DOW) carries out this mission by managing, protecting, and enhancing the quality and quantity of the Commonwealth's water resources. Through implementation of voluntary, regulatory, and educational programs, DOW aims to maintain the Commonwealth's water resources for present and future generations. The purpose of this Wetland Program Plan (WPP) is to describe the goals, objectives, and activities DOW plans to address to fulfill its mission, with regards to wetland water quality in the state, over the next five years.

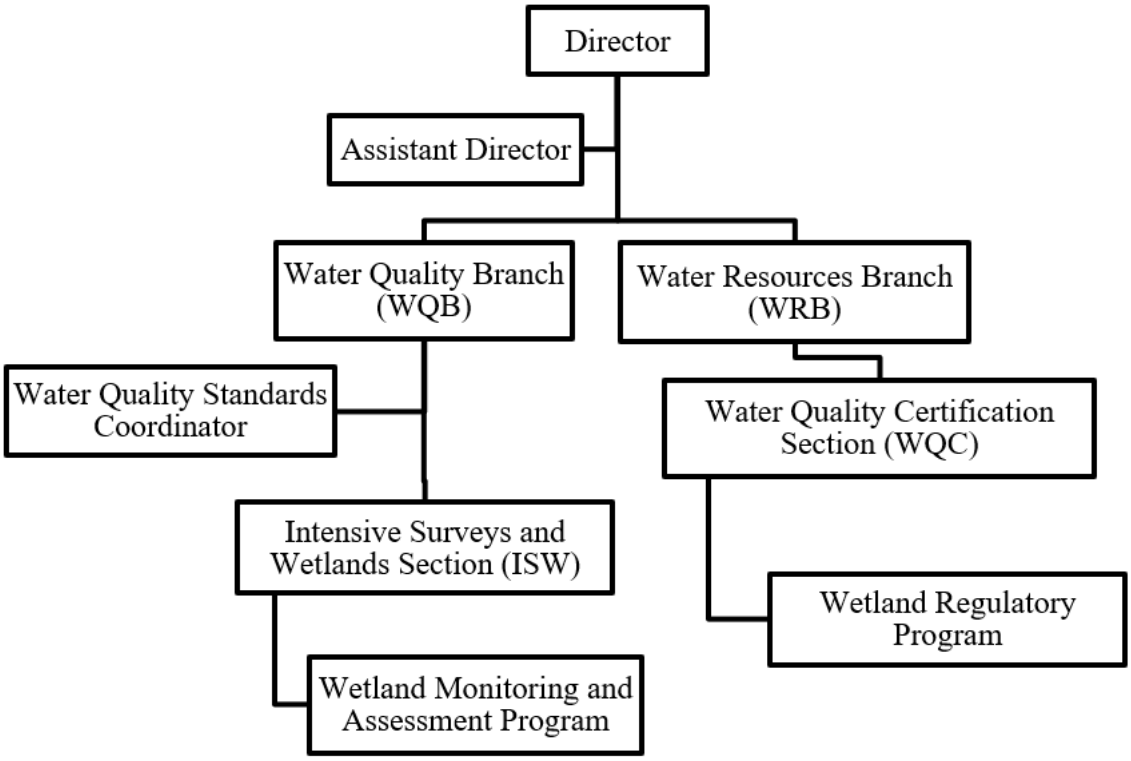
The U.S. Environmental Protection Agency (EPA) Core Elements of Effective State and Tribal Wetlands Programs (Core Elements Framework) is part of the Enhancing State and Tribal Programs Initiative (ESTP). The Core Elements Framework (CEF), identifies four components of a comprehensive and effective wetlands program, which are: 1) Monitoring and Assessment, 2) Regulatory, 3) Water Quality Standards for Wetlands, and 4) Voluntary Restoration and Protection. The Wetlands Program WPP addresses activities in each of the core elements. Wetland Program Development Grants (WPDG), also part of the ESTP, provided assistance for the development of this WPP.

Through WPP development, DOW has identified internal and external stakeholders and resources that will be needed to undertake the objectives and activities in this plan. Throughout the next five years, DOW will seek out opportunities to engage and assist stakeholders in order to build the program's capacity to protect the Commonwealth's wetland resources. The external stakeholders include, but are not limited to:

- U.S. Army Corps of Engineers (USACE), primarily Louisville, Nashville, and Memphis
- U.S. Department of Agriculture, Forest Service, Daniel Boone National Forest
- U.S. Department of Agriculture, Natural Resources Conservation Service
    - Wetland Reserve Enhancement Partnership
- U.S. Fish and Wildlife Resources
- Kentucky Department of Fish and Wildlife Resources
    - Fee-in-lieu-of (FILO) program
- Office of Kentucky Nature Preserves / KY Natural Heritage Program
- Kentucky Transportation Cabinet
- Academic groups from Kentucky's universities
- Local government councils (e.g., city, county)
- Professional organizations represented by;
    - The regulated community
    - Environmental and/or non-profit organizations

Overall Goals and Time Frame

The primary purpose of this WPP is to communicate the Wetlands Program's goals for the next five years. There have been substantial personnel changes in the Energy and Environment Cabinet since Kentucky's last WPP was submitted, and Kentucky's previous WPP expired in 2018, which warranted a re-evaluation of the Program's status and future goals. To provide context for the degree of change the Wetlands Program has experienced, here is a list of the Program's most notable changes: 1) personnel turnover, 2) reorganization of DOW that led to the separation of Wetlands Program staff into two different branches, 3) new management staff, and 4) increased staffing within the Monitoring and Assessment Program. Just as significant, Kentucky elected a new governor in late 2019, which resulted in appointments of a new Secretary (Energy and Environment Cabinet) and Division of Water Director. The current organizational structure of the program is as follows:



In light of this recent and significant organizational change, Wetlands Program staff plan to continue to review past work, re-evaluate needs, and work closely with management to determine the future direction of the Program. At this time, Wetlands Program activities are expected to involve continued development of the Monitoring and Assessment Program, so that it is capable of producing the data needed to inform wetland policy and management decisions, especially those related to enhancing and enforcing water quality standards for wetlands. In support of enforcing water quality standards, the Water Quality Branch (WQB) and Water Resources Branch (WRB) will continue to work together to strengthen the 401 Water Quality

Certification (WQC) program. Lastly, the Wetlands Program intends to build a stronger relationship with its state and federal agency partners, regulated community, and general public.

Lotus marsh, Adair County, Kentucky

Core Elements and Schedules

Element 1: Monitoring and Assessment

Background

The DOW has implemented a strong monitoring and assessment program with regard to the Clean Water Act (CWA) for most of the Commonwealth's surface waters. However, there is currently no comparable monitoring and assessment program for Kentucky's wetland resources, even though wetlands are Waters of the Commonwealth by regulatory definition. Significant actions in all core elements of the Wetlands Program need to be undertaken to attain full implementation of the CWA.

A long-term goal of the Wetlands Program is to develop a comprehensive monitoring strategy that would allow for designated use support assessment as well as status and trends reporting of wetland condition in Kentucky. To be successful in this endeavor, the Wetlands Program will need to incorporate equivalent programs to those involved in the monitoring strategies for streams, rivers, and lakes, such as: 1) ambient monitoring at reference and non-reference condition wetlands, 2) probabilistic surveys at randomly-selected stations, and 3) intensive targeted surveys. The CEF emphasizes that a strong Monitoring and Assessment Program is the foundation for supporting the other three core elements. Therefore, the primary focus of this WPP is to describe the needs and goals for developing a robust monitoring program.

Since Kentucky's previous WPP was submitted, DOW assessment protocols have undergone significant development. The first versions of the vegetation and avian indices of biological integrity (IBI) were drafted and underwent significant testing from 2016-2018. Significant progress has been made in developing the amphibian IBI and the first version will be completed in 2020. In conjunction with these activities, the Kentucky Wetland Rapid Assessment Method (KY-WRAM) continued to undergo testing across the state. Although there has been considerable progress made in creating these wetland assessment tools, further testing is needed before they can be fully implemented to assess designated use attainment, track trends, and assess the success of restoration and protection efforts. In the next five years, it is the Wetlands

Program's goal to complete testing for each of the biological and rapid assessment tools for riverine wetlands and one additional wetland type (e.g., depressional), for all of Kentucky's bioregions.

In addition to the progress made in developing wetland assessment tools, DOW has made substantial progress toward increasing the capacity to perform monitoring activities internally, rather than employing contractors. For the majority of its existence, 2011-2019, the Monitoring and Assessment Program has primarily contracted out data collection. By the end of 2018, the Monitoring and Assessment Program received an additional full-time staff position to assist the Wetlands Program Coordinator. This provided the resources need for DOW to begin collecting water chemistry and *in situ* data in 2019. These data will help lay the foundation for an ambient monitoring program, and provide baseline data for evaluation of existing water quality standards for wetlands. In addition, in 2019 DOW hired a third full-time biologist, who will primarily perform vegetation assessments. For the first time since the Monitoring and Assessment Program was created, DOW will perform all of its vegetation surveys.

Once the shorter-term goal to complete the development and testing of assessment tools is achieved, the tools will be used to assess and report on wetland condition statuses and trends. DOW anticipates that assessment of designated use attainment will be based on water chemistry, physicochemistry, rapid condition, and biological community data. Because wetland types and regions in the state are expected to differ naturally (e.g., landscape position, physiographic properties, and biological communities) the monitoring strategy will include sampling in all wetland types and bioregions (see the table below for the five year schedule of monitoring activities).

1. Monitoring and Assessment tools:
    - KY Wetland Rapid Assessment Method (KY-WRAM)
    - KY Vegetation Index of Biological Integrity (KY-VIBI)
    - KY Avian Index of Biological Integrity (KY-AIBI)
    - KY Amphibian Index of Biological Integrity (KY-AmphIBI)
2. Hydrogeomorphic (HGM) wetland types:
    - Riverine
    - Depressional
    - Mineral Flat
    - Lacustrine Fringe
    - Slope
3. Bioregions:
    - Mountains: EPA Level III Ecoregions 68, 69, 70
    - Bluegrass: EPA Level IV Ecoregions 71d, 71k, 71l
    - Pennyroyal: EPA Level IV Ecoregions 71a, 71b, 71c, 71e, 71f, 71g, 71h
    - Mississippi Valley-Interior River (MVIR): EPA Level III Ecoregions 72, 73, 74

Wetlands Monitoring Activities 2020-2024

Field Season	Projects	Activities
2020	Mountains, Riverine	Vegetation, Avian
2021	Statewide NWCA	NWCA survey methods
2021	MVIR, Riverine	Vegetation, Avian, Amphibian, Water Chemistry
2022	Bluegrass, Depressional	Vegetation, Avian, Amphibian, Water Chemistry
2023	MVIR, Depressional	Vegetation, Avian, Amphibian, Water Chemistry
2024	Pennyroyal, Depressional	Vegetation, Avian, Amphibian, Water Chemistry

Updating the methods for identifying wetlands is another priority for the program. Wetland locations were initially selected using the EPA National Wetland Condition Assessment's NWCA) Generalized Random Tessellation Stratified Survey Design (GRTS) probabilistic approach and the National Wetlands Inventory (NWI). Over time, it was determined that a probabilistic approach to sampling wetlands was not in agreement with program needs. Since 2018, DOW has used a hybrid approach for site selection, which involves randomly selecting sites, evaluating stressors, categorizing sites into potential condition categories, and targeted site selection as needed.

The use of the NWI for site selection often resulted in sites that lacked some or all of the delineation criteria for being a wetland. The need for an alternative method to identify potential wetland locations was recognized and, since 2018, Natural Resources Conservation Service (NRCS) soils maps have been used to create polygons of potential wetlands as a screening tool for site selection. Although this approach has been successful at identifying jurisdictional wetlands, its use is limited because it relies on NRCS defined soil characteristics and does not incorporate other available data, such as digital elevation data. As such, DOW has identified the need to develop a Kentucky wetland inventory (KWI) that incorporates a comprehensive suite of data. An up-to-date inventory of wetland resources will be an essential tool for an effective monitoring and assessment program, as it will provide baseline information on the quantity and location of wetlands in the state.

Using the structure of the EPA's Program Building Activities Menu (U.S. EPA, Core Elements of an Effective State and Tribal Wetlands Program), we have constructed tables listing our objectives, actions, and activities for Kentucky's monitoring and assessment strategy. For a list of acronyms and their meaning, see Appendix A. The timeline for these activities can be found in Appendix B.

Objectives

Objective 1. Build program capacity to perform biological, water chemistry, and KY-WRAM monitoring and assessment

Action 1. Refine training program for KY-WRAM, vegetation, amphibian, and water chemistry monitoring
a. Update presentations and other materials to incorporate feedback from trainings
Action 2. Develop training program for avian monitoring
a. Create standard operating procedure by modifying the guidance manual developed by contractors
b. Explore methods to assure quality of data collected (e.g., record point count surveys and have an independent observer review the recordings)
c. Create training presentations
Action 3. Provide training to Water Quality Branch monitoring staff to perform wetland assessments
a. Crosstrain staff on vegetation identification, sampling method, and IBI score calculation
b. Crosstrain staff on amphibian identification, sampling method, and IBI score calculation
c. Crosstrain staff on bird identification, sampling method, and IBI score calculation
d. Crosstrain staff on KY-WRAM
e. Crosstrain staff on water chemistry and in-situ physicochemistry sampling methods

Objective 2. Implement wetland assessment methods into Wetlands Program

Action 1. Verify that biological and rapid condition assessments can discern wetland condition along a gradient of anthropogenic disturbance for all bioregions and wetland types.

a. Identify and organize all existing assessment data; evaluate past projects for completeness; obtain missing data and/or products from contractors

b. Perform gap analysis to determine data needs

c. Collect reference and non-reference data in each bioregion and wetland type combination for each assessment method, as determined by the gap analysis

d. Verify usability of data by performing quality assurance procedures on all data collected

e. Evaluate how to modify the Disturbance Indicator method to serve as an index (i.e., independent, non-biological measure of anthropogenic disturbance) in which to verify assessment methods

f. Perform data analyses to determine if there is a statistical distinction between reference and non-reference sites, and between all condition categories for each assessment method, wetland type, and bioregion

g. Prepare and publish report from results of validation study to document and provide transparency into validation process

Action 2. Develop and refine monitoring designs and implement wetland assessment methods.

a. Explore development of statewide monitoring program to assess ambient condition of wetlands

b. Explore development of a statewide monitoring program to assess reference wetland condition

c. Explore need to develop a monitoring program to assess effectiveness of best management practices for wetlands

d. Evaluate the need to collect soil indicators of wetland condition

Action 3. Explore using Unmanned Aerial Systems (UASs) to support wetland mapping and data collection

a. Designate program staff to participate in the Energy and Environment Cabinet's UAS Users Committee

b. Determine which monitoring activities can be accomplished or supplemented by using UASs

c. Work with the Users Committee to determine the equipment needed to meet monitoring needs

d. Begin developing a long-term strategy to implement UASs into monitoring program

Action 4. Incorporate National Wetland Condition Assessment survey data and methods, as needed

a. Perform 2021 NWCA survey at Kentucky sites

b. Evaluate rationale for NWCA indicators and methods

c. Begin developing a long-term strategy to implement NWCA data or methods into monitoring program

Objective 3. Develop tools to support monitoring and assessment activities

Action 1. Incorporate Wetlands Program monitoring data into K-WADE (DOW database)

a. Begin creating stations for backlog of sites (pre-2018 sites)

b. Input backlog of KY-WRAM and water chemistry data

c. Draft list of anticipated database modifications needed for vegetation, amphibian, and bird community data and index of biological integrity metrics, and NWCA data

d. Explore funding sources and expertise to complete database modifications

e. Hire contractor and/or use "in-house" expertise; complete modifications

f. Begin entering backlog of data for biological communities and indices

Action 2. Explore development of a Kentucky wetlands inventory using remote-sensing data

a. Evaluate needs and potential uses for a statewide wetlands inventory

b. Collaborate with other DOW programs and state agencies to assess tools that are currently available; identify the resources necessary to develop a statewide inventory of wetlands

c. Create a strategy and/or scope of work for developing KWI

d. Begin development of a KWI

Floodplain depressional wetland in Fleming County, Kentucky

Element 2: Regulatory

Background

Kentucky regulations (KAR 401 10:001(77)) define wetlands by 40 CFR 122.2, which describes wetlands as: "…those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Pursuant to KAR 401 10:001(77), Kentucky's regulatory definition of wetlands includes water bodies that are jurisdictional under the CWA §404 permit program, known as waters of the U.S. (WOTUS), and non-jurisdictional, isolated wetlands. Collectively, these are considered state waters, or "Waters of the Commonwealth".

DOW administers a statewide §401 WQC program as the sole regulatory mechanism for the management and protection of wetlands. The §401 WQC program reviews and certifies federal permits and licenses for activities that propose to impact jurisdictional waters and relies on current surface water quality standards to make certification decisions. DOW has not adopted mitigation provisions beyond what is required under CWA §404, does not require state-level jurisdictional determinations, nor has it developed wetland-specific water quality standards.

Reliance on USACE jurisdictional determinations restricts DOW's review during enforcement actions and in the review of activities occurring within isolated wetlands. As such, DOW recognizes the need to promulgate specific regulations in order to protect the Commonwealth's aquatic resources. It has been a goal of DOW to develop regulations, such as providing authorization to construct a state permitting program for isolated wetlands, and other non-CWA §404 waters. With the promulgation of the new The Navigable Waters Protection Rule this year, it is an opportune time to discuss the development of a state wetland regulatory program.

Until such regulations can be promulgated, DOW will explore options within the current framework to protect Kentucky's streams and wetlands. For example, DOW will continue to coordinate with the USACE to review activities in non-compliance with CWA §404 and §401 and state water quality standards. In these cases, DOW may issue notices of violation, and work to require restoration and achieve compliance as appropriate. In addition, the Wetlands Program has initiated contact with the USACE Louisville District's Regulatory Division to pursue the use of the KY-WRAM and the KY-VIBI in their CWA §404 permitting and mitigation/compliance programs. DOW is planning to provide training over the next few years to assist the USACE and Interagency Review Team (IRT) in evaluating the KY-WRAM and KY-VIBI. If adopted by these agencies, these assessment tools may be used to (1) support avoidance and minimization measures, (2) determine mitigation ratios, (3) measure pre- and post-mitigation condition, and (4) determine credit release.

The WQC program currently relies on Rapid Bioassessment Protocol (RBP) method for determining stream credits and assessing ecological lift for credit release. While this method is

useful for evaluating stream habitat for 305(b) assessment purposes, its utilization in measuring ecological lift due to restoration efforts is inappropriate. The WQC program is exploring the development of the Stream Quantification Tool (SQT) as an alternative to the RBP.

The recent reorganization that split the Wetlands Program into two different branches, while beneficial in some ways, also resulted in the creation of some challenges. The need to improve communication among program staff has been identified as a priority. One of the most complicated goals within this WPP, and one that will require strong collaboration, is the development and enforcement of water quality standards. This will be a shared task among program staff in the WQB and WRB. To address these challenges, the Wetlands Program created workgroups that meet regularly to discuss program priorities and determine strategies for developing water quality standards. The workgroups are already providing measureable success. For example, Monitoring and Assessment and WQC program staff have been working together to coordinate with the USACE regarding adoption of, and training for, the KY-WRAM. Staff have also been discussing how best to address impacts to wetlands in the wake of the final WOTUS rule. Program staff will continue to work toward improving communication and finding strategies that benefit program development over the next five years.

Using the structure of the EPA's Program Building Activities Menu (U.S. EPA, Core Elements of an Effective State and Tribal Wetlands Program), we have constructed tables listing our objectives, actions, and activities for Kentucky's Regulatory strategy. For a list of acronyms and their meaning, see Appendix A. The timeline for these activities can be found in Appendix B.

Objectives

Objective 1. Explore promulgation of regulations related to impacts to wetlands and consider the need and support for development of a state permitting program

Action 1. Identify specific regulations needed to be protective of water quality standards for wetlands
a. Develop strategy for coordination of regulation development among programs to assert 401 WQC authority
b. Interpret existing KAR and KRS regulations and identify regulations that are insufficient at protecting wetlands
c. Research other regulatory programs and statutes (e.g., Ohio EPA isolated wetlands permitting, Tennessee's ARAP)
d. Explore promulgation of new regulations

Objective 2: Explore development of new tools to measure pre- and post-mitigation stream and wetland condition

Action 1. Assess the Stream Quantification Tool (SQT) for use in Kentucky
a. Coordinate SQT training with EPA Region 4 and states that developed tool
b. Evaluate the need for a SQT-type tool in Kentucky
c. Explore modification of the tool for Kentucky regulatory programs
d. Begin process of developing SQT

Objective 3: Implement wetland monitoring and assessment tools in 404/401 Programs and promote the cross training of program staff

Action 1. Implement the use of KY-WRAM and IBIs by state and federal agencies
a. Communicate regularly with the USACE, FILO, and IRT to facilitate adoption of tools
b. Provide inter- and intra- agency training on assessment methods (WQC, FILO, USACE)
c. Adopt a data-sharing agreement
Action 2. Continue building the Wetlands Regulatory Workgroup
a. Hold monthly workgroup meetings to identify wetland monitoring and assessment data needs to support regulatory program goals
b. Promote regular communication between program staff and upper management
Action 3. Participate in shared training opportunities
a. Send staff to national and regional conferences, workshops, and other training opportunities (e.g., ASWM annual meeting, EPA Wetlands/401 Workshop)

Element 3: Water Quality Standards for Wetlands

Background

Section 101(a) of the CWA states that 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 CWA between wetlands and other waters, yet 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 (Kusler and Christie, 2012). Given these challenges, it is not surprising that so few states have promulgated water quality standards for wetlands. In fact, as of 2015 when the Association of State Wetland Managers (ASWM) initially released their report on the status and trends of state wetland programs (Zollitsch and Christie, 2016), only six states had developed wetland-specific water quality standards and only 10 states were in the process of developing standards.

According to the 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", however, it is recognized that the current definitions within Kentucky statute and regulations may not provide enough description to accurately identify all of the various wetland types throughout the state. 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 224.1-010(32)).

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. Lagoons used for waste treatment and effluent ditches that 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 (188)).

In 2016 DOW formed the Water Quality Standards for Wetlands Workgroup to complete the following tasks: (1) provide an updated definition of wetlands for promulgation into regulations, (2) determine appropriate designated uses for wetlands, (3) examine data needs for evaluation of narrative and numeric criteria, particularly for aquatic life use, and (4) incorporate the use of the KY-WRAM and IBI's in implementing standards. The workgroup has proven to be a valuable communication tool and has provided a solution for ensuring that the tasks involved in developing water quality standards are assigned to applicable staff within DOW.

In order to develop water quality standards Kentucky will need to spend considerable effort over the next five years continuing to lay the groundwork upon which the standards will be based. Extensive chemical, *in situ*, biological, and physical data collection activities will need to continue in order to support the evaluation of appropriate numeric and narrative standards development. These data will not only provide the foundation for developing water quality standards, they will be used to finalize the KY-WRAM and IBI's which will aid in making designated use attainment decisions.

Using the structure of the EPA's Program Building Activities Menu (U.S. EPA, Core Elements of an Effective State and Tribal Wetlands Program), we have constructed tables listing our objectives, actions, and activities for Kentucky's Water Quality Standards for Wetlands strategy. For a list of acronyms and their meaning, see Appendix A. The timeline for these activities can be found in Appendix B.

Objectives

Objective 1. Continue to pursue the development of wetland-specific water quality standards

Action 1. Update definition of wetlands 401 KAR

a. Identify appropriate updates to wetland definitions within state regulations
b. Determine if wetland types should be included in definitions
c. Draft updated language for applicable sections within 401 KAR

Action 2. Evaluate appropriate wetland-specific designated uses

a. Evaluate current designated uses and their application to wetlands
b. Develop recommendations for applying designated uses to wetlands

Action 3. Gather and analyze monitoring data and other information

a. Develop a data management strategy for historical biological, chemical, and physical data collected from the wetland monitoring and assessment program
b. Prioritize data collection to address data gaps
c. Develop methods for identifying reference condition
d. Evaluate wetland condition category breakpoints

Action 4. Analyze the development of narrative criteria.

a. Review current narrative criteria for Waters of the Commonwealth for application to wetlands
b. Explore wetland specific narrative biological, physical, and chemical criteria
c. Draft technical documents that support narrative criteria

Action 5. Analyze the development of numeric criteria

a. Evaluate current numeric standards and their application to wetlands
b. Review data and analyze relationships between biological, chemical, and physical parameters

Objective 2: Incorporate the development of wetland-specific water quality standards into agency decision-making

Action 1. Communicate program needs within DOW

a. Promote communication via special topics workgroups
b. Develop strategy for coordination of regulation development among programs for water quality standards

Element 4: Voluntary Restoration and Protection

Background

The importance of increasing the acreage of functioning wetlands and reducing wetland loss through protective measures is recognized as a priority for the program. While DOW does not plan to create a voluntary restoration and protection program over the next five years, program goals include providing assistance to other natural resource and wetland managers in their efforts and encouraging public education regarding the value of wetlands. The perception that wetlands are "wastelands" is a sentiment that is still often expressed by the general public in Kentucky, therefore, engaging citizens in educational opportunities to increase awareness for the importance of wetlands is critical.

Improving communication among agencies and other natural resource professionals regarding wetland protection and restoration efforts will allow DOW to identify what types of assistance the program is able to provide towards those efforts. DOW has a variety of assessment tools, data, and expertise that could assist in evaluating the effectiveness of wetland restoration and protection projects and identifying potential project sites. For example, the Wetland Prioritization Tool can provide a better understanding of the factors that are important in planning wetlands protection or mitigation projects. The IBI's that DOW is developing could also be used to evaluate a wetland's response to restoration and management activities.

Using the structure of the EPA's Program Building Activities Menu (U.S.EPA, Core Elements of an Effective State and Tribal Wetlands Program), we have constructed tables listing our objectives, actions, and activities for Kentucky's Voluntary Restoration and Protection strategy. For a list of acronyms and their meaning, see Appendix A. The timeline for these activities can be found in Appendix B.

Objectives

Objective 1. Enhance capacity for voluntary wetland protection and restoration efforts among natural resource practitioners / wetland managers in Kentucky

Action 1. Improve communication among stakeholders to foster awareness of project goals, restoration efforts, and data sharing opportunities
a. Organize and host a Kentucky Wetlands Summit b. Foster awareness of DOW data, especially biological community data from high-quality sites, which could be provided to assist voluntary wetland management decisions (e.g., development of performance standards)
Action 2. Exchange location and condition information of high-quality wetlands with other intra-state agencies and/or other states
a. Gauge interest in sharing data b. Form reciprocity agreements with intra-state agencies c. Identify shared ecoregion boundaries and initiate contact with other state agencies
Action 3. Identify priority areas for wetland restoration and protection
a. Use assessments from wetland monitoring program to identify potential project locations b. Provide training to and assist stakeholders to perform wetland assessment methods

Objective 2. Create a public education/outreach program to promote wetland protection

Action 1. As resources allow, participate in local school and community events to educate children and adults on wetland functions and wildlife
a. Explore events where participation would be applicable and welcomed (e.g., elementary school classrooms, Scouts Troop meetings, local festivals, etc.) b. Explore development of information materials that could be handed out (e.g., pamphlets, coloring sheets); collaborate with the DOW WMB
Action 2. As resources allow, communicate with landowners (e.g., agriculture) about the importance of wetland protection for water quality
a. Explore the potential to work with county and other local conservation districts to identify opportunities to speak with groups of crop and cattle farmers b. Explore creation of layperson-friendly presentations to educate landowners c. Continue exploring the development of reports that explain findings from monitoring efforts to provide to landowners who allow data collection on their property

Appendix A. List of acronyms

ARAP	Aquatic Resource Alteration Permit
ASWM	Association of State Wetland Managers
CEF	Core Elements Framework
CFR	Code of Federal Regulations
CWA	Clean Water Act (Federal Water Pollution Control Act, 1972 amendments)
DEP	Kentucky Department for Environmental Protection
DOW	Kentucky Division of Water
EPA	United States Environmental Protection Agency
ESTP	Enhancing State and Tribal Programs Initiative
FILO	Kentucky Fee-In-Lieu-Of Program
GRTS	Generalized Random Tessellation Stratified Survey Design
HGM	Hydrogeomorphic Wetland Classification System
IBI	Index (Indices) of Biological Integrity
IRT	Interagency Review Team
ISW	Intensive Surveys and Wetlands Section
KAR	Kentucky Administrative Regulations
KRS	Kentucky Revised Statutes
KWADE	Kentucky Water Assessment Database for Environmental Sampling
KY-AIBI	Kentucky Avian Index of Biological Integrity
KY-AmphIBI	Kentucky Amphibian Index of Biological Integrity
KY-VIBI	Kentucky Vegetation Index of Biological Integrity
KY-WRAM	Kentucky Wetland Rapid Assessment Method
KWI	Kentucky Wetland Inventory
NRCS	Natural Resources Conservation Service
NWCA	National Wetland Condition Assessment
NWI	National Wetlands Inventory
QA/QC	Quality Assurance / Quality Control
RBP	Rapid Bioassessment Protocol
SQT	Stream Quantification Tool
UAS	Unmanned Aerial System(s)
USACE	Unites States Army Corps of Engineers
WMB	Water Management Branch
WQB	Water Quality Branch
WRB	Water Resources Branch
WOTUS	Navigable Waters Protection Rule: Definition of "Waters of the United States"
WPP	Wetland Program Plan
WQC	Water Quality Certification

Appendix B. Timeline of Activities

Monitoring and Assessment

Objective – Action – Activity	2020	2021	2022	2023	2024
Objective 1. Build program capacity to perform biological, water chemistry, and KY-WRAM monitoring and assessment					
Action 1. Refine training program for KY-WRAM, vegetation, amphibian, and water chemistry monitoring					
1.1. a. Update presentations and other materials to incorporate feedback from trainings					
Action 2. Develop training program for avian monitoring					
1.2.a. Create standard operating procedure by modifying the guidance manual developed by contractors					
1.2.b. Develop QA/QC criteria for surveys (e.g., record point count surveys and have an independent observer review the recordings)					
1.2.c. Create training presentations					
Action 3. Provide training to Water Quality Branch monitoring staff to perform wetland assessments					
1.3.a. Cross-train staff on vegetation identification, sampling method, and IBI score calculation					
1.3.b. Cross-train staff on amphibian identification, sampling method, and IBI score calculation					
1.3.c. Cross-train staff on bird identification, sampling method, and IBI score calculation					
1.3.d. Cross-train staff on KY-WRAM					
1.3.e. Cross-train staff on water chemistry and in-situ physicochemistry sampling methods					

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Objective – Action – Activity	2020	2021	2022	2023	2024
Objective 2. Implement wetland assessment methods into Wetlands Program					
Action 1. Verify that biological and rapid condition assessments can discern wetland condition along a gradient of anthropogenic disturbance for all bioregions and wetland types					
2.1.a. Identify and organize all existing assessment data; evaluate past projects for completeness; obtain missing data and/or products from contractors					
2.1.b. Perform gap analysis to determine data needs					
2.1.c. Collect reference and non-reference data in each bioregion and wetland type combination for each assessment method, as determined by the gap analysis					
2.1.d. Verify usability of data by performing quality assurance procedures on all data collected					
2.1.e. Develop an index to serve as an independent, non-biological measure of anthropogenic disturbance in which to verify assessment methods					
2.1.f. Perform data analyses to determine if there is a statistical distinction between reference and non-reference sites, and between all condition categories for each assessment method, wetland type, and bioregion					
2.1.g. Prepare and publish report from results of validation study to document and provide transparency into validation process					
Action 2. Develop and refine monitoring designs and implement wetland assessment methods					
2.2.a. Explore development of statewide monitoring program to assess ambient condition of wetlands					
2.2.b. Explore development of a statewide monitoring program to assess reference wetland condition					
2.2.c. Explore need to develop a monitoring program to assess effectiveness of best management practices for wetlands					
2.2.d. Evaluate the need to collect soil indicators of wetland condition					
Action 3. Explore using Unmanned Aerial Systems (UASs) to support wetland mapping and data collection					
2.3.a. Designate program staff to participate in the Energy and Environment Cabinet's sUAS Users Committee					
2.3.b. Determine which monitoring activities can be accomplished or supplemented by using UASs					
2.3.c. Work with the Users Committee to determine the equipment needed to meet monitoring needs					
2.3.d. Begin developing a long-term strategy to implement UASs into monitoring program					
Action 4. Incorporate National Wetland Condition Assessment survey data and methods, as needed					
2.4.a. Perform 2021 NWCA survey at Kentucky sites					
2.4.b. Evaluate rationale for NWCA indicators and methods					
2.4.c. Begin developing a long-term strategy to implement NWCA data or methods into monitoring program					

Objective – Action – Activity	2020	2021	2022	2023	2024
Objective 3. Develop tools to support monitoring and assessment activities					
Action 1. Incorporate Wetlands Program monitoring data into KWADE (DOW database)					
3.1.a. Begin creating stations for backlog of sites (pre-2018 sites)	■	■			
3.1.b. Input backlog of KY-WRAM and water chemistry data	■	■			
3.1.c. Draft list of anticipated database modifications needed for vegetation, amphibian, and bird community data and index of biological integrity metrics, and NWCA data			■		
3.1.d. Explore funding sources and expertise to complete database modifications				■	■
3.1.e. Hire contractor and/or use "in-house" expertise; complete modifications				■	■
3.1.f. Begin entering backlog of data for biological communities and indices				■	■
Action 2. Explore development of a Kentucky wetlands inventory using remote-sensing data					
3.2.a. Evaluate needs and potential uses for a statewide wetlands inventory	■				
3.2.b. Collaborate with other DOW programs and state agencies to assess tools that are currently available; identify the resources necessary to develop a statewide inventory of wetlands	■	■			
3.2.c. Create a strategy and/or scope of work for developing KWI		■	■	■	
3.2.d. Begin development of a KWI		■	■	■	

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Regulatory

Objective – Action – Activity	2020	2021	2022	2023	2024
Objective 1. Explore promulgation of regulations related to impacts to wetlands and consider the need and support for development of a state permitting program					
Action 1. Identify specific regulations needed to be protective of water quality standards for wetlands					
1.1.a. Develop strategy for coordination of regulation development among programs to assert 401 Water Quality Certification authority					
1.1.b. Interpret existing KAR and KRS regulations and identify regulations that are insufficient at protecting wetlands					
1.1.c. Research other regulatory programs and statutes (e.g., Ohio EPA isolated wetlands permitting, Tennessee's ARAP)					
1.1.d. Explore promulgation of new regulations					
Objective 2: Explore development of new tools to measure pre- and post-mitigation stream and wetland condition					
Action 1. Assess the Stream Quantification Tool (SQT) for use in Kentucky					
2.1.a. Coordinate SQT training with EPA R4 and states that developed tool					
2.1.b. Evaluate the need for a SQT-type tool in Kentucky					
2.1.c. Explore modification of the tool for Kentucky regulatory programs					
2.1.d. Begin process of developing SQT					
Objective 3: Implement wetland monitoring and assessment tools in 404/401 Programs and promote the cross training of program staff					
Action 1. Implement the use of KY-WRAM and IBIs by state and federal agencies					
3.1.a. Communicate regularly with the USACE, FILO, and IRT to facilitate adoption of tools					
3.1.b. Provide inter- and intra- agency training on assessment methods (WQC, FILO, USACE)					
3.1.c. Adopt a data-sharing agreement					
Action 2. Continue building the Wetlands Regulatory Workgroup					
3.2.a. Hold monthly workgroup meetings to identify wetland monitoring and assessment data needs to support regulatory program goals					
3.2.b. Promote regular communication between program staff and upper management					
Action 3. Participate in shared training opportunities					
3.1.a. Send staff to national and regional conferences, workshops, and other training opportunities (e.g., ASWM annual meeting, EPA Wetlands/401 Workshop)					

Water Quality Standards for Wetlands

Objective – Action – Activity	2020	2021	2022	2023	2024
Objective 1. Continue to pursue the development of wetland-specific water quality standards					
Action 1. Update definition of wetlands 401 KAR					
1.1.a. Identify appropriate updates to wetland definitions within state regulations	■	■			
1.1.b. Determine if wetland types should be included in definitions	■	■			
1.1.c. Draft updated language for applicable sections within 401 KAR	■	■			
Action 2. Evaluate appropriate wetland-specific designated uses					
1.2.a. Evaluate current designated uses and their application to wetlands	■	■			
1.2.b. Develop recommendations for applying designated uses wetlands			■		
Action 3. Gather and analyze monitoring data and other information					
1.3.a. Develop a data management strategy for historical biological, chemical, and physical data collected from the wetland monitoring and assessment program	■	■			
1.3.b. Prioritize data collection to address data gaps	■	■	■	■	■
1.3.c. Develop methods for identifying reference condition	■	■			
1.3.d. Evaluate wetland condition category breakpoints	■				
Action 4. Analyze the development of narrative criteria					
1.4.a. Review current narrative criteria for Waters of the Commonwealth for application to wetlands			■	■	
1.4.b. Explore wetland specific narrative biological, physical, and chemical criteria				■	■
Action 5. Analyze the development of numeric criteria					
1.5.a. Evaluate current numeric standards and their application to wetlands			■	■	
1.5.b. Review data and analyze relationships between biological, chemical, and physical parameters	■	■	■	■	■
Objective 2: Incorporate the development of wetland-specific water quality standards into agency decision-making					
Action 1. Communicate program needs within DOW					
2.1.a. Promote communication via special topics workgroups	■	■	■	■	■
2.1.b. Develop strategy for coordination of regulation development among programs for water quality standards	■	■	■	■	■

Voluntary Restoration and Protection

Objective – Action – Activity	2020	2021	2022	2023	2024
Objective 1. Enhance capacity for voluntary wetland protection and restoration efforts among natural resource practitioners / wetland managers in Kentucky					
Action 1. Improve communication among stakeholders to foster awareness of project goals, restoration efforts, and data sharing opportunities					
1.1.a. Organize and host a Kentucky Wetlands Summit					
1.1.b. Foster awareness of DOW data, especially biological community data from high-quality sites, which could be provided to assist voluntary wetland management decisions (e.g., development of performance standards)					
Action 2. Exchange location and condition information of high-quality wetlands with other intra-state agencies and/or other states					
1.2.a. Gauge interest in sharing data					
1.2.b. Form reciprocity agreements with intra-state agencies					
1.2.c. Identify shared ecoregion boundaries and initiate contact with other state agencies					
Action 3. Identify priority areas for wetland restoration and protection					
1.3.a. Use assessments from wetland monitoring program to identify potential project locations					
1.3.b. Provide training to and assist stakeholders to perform wetland assessment methods					
Objective 2. Create a public education/outreach program to promote wetland protection					
Action 1. As resources allow, participate in local school and community events to educate children and adults on wetland functions and wildlife					
2.1.a. Explore events where participation would be applicable and welcomed					
2.1.b. Explore development of information materials that could be handed out; collaborate with the DOW WMB					
Action 2. As resources allow, communicate with landowners (e.g., agriculture) about the importance of wetland protection for water quality					
2.2.a. Explore the potential to work with county and other local conservation districts to identify opportunities to speak with groups of crop and cattle farmers					
2.2.b. Explore creation of layperson-friendly presentations to educate landowners					
2.2.c. Continue exploring the development of reports that explain findings from monitoring efforts to provide to landowners who allow data collection on their property					

Literature Cited

Kusler, J. A. and J. Christie (2012). Wetland Water Quality Standards for States. Association of State Wetland Managers

U.S. EPA. (n.d.). Core Elements of an Effective State and Tribal Wetlands Program. Retrieved February 10, 2020, from https://www.epa.gov/sites/production/files/2015-10/documents/2009_03_10_wetlands_initiative_cef_full.pdf

Zollitsch, B. and J. Christie (2016). *Status and Trends Report on State Wetland Programs in the United States*. Association of State Wetland Managers