United States Environmental Protection Agency

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Protecting Waters and Wetlands in Indian Country:

A Guide for Developing Tribal Wetland Management Programs

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Development of This Guide

In 2020, the U.S. Environmental Protection Agency (EPA) contracted with Eastern Research Group (ERG), the Consensus Building Institute, and Lucy Moore Associates to coordinate and manage the preparation of this guide, *Protecting Waters and Wetlands in Indian Country: A Guide for Developing Tribal Wetland Management Programs*. During the development process, a Tribal Roundtable of 16 tribal representatives from around the country met with contractors, five EPA regional and headquarters staff, and a staff member of the National Association of Wetland Managers to ensure tribal needs, knowledge, and perspectives were presented in this guide. EPA technical leadership was provided by Kathleen Kutschenreuter (EPA Headquarters) and Linda Storm (EPA Region 10). Appendix A lists the names and affiliations of the Roundtable members.

Members of the Roundtable gathered via videoconference nine times between November 2020 and September 2021. The initial discussions focused on determining the scope and organization of this guide, as well as identifying critical topics of interest. The next set of Roundtable meetings centered on identifying case studies, challenges, and recommendations that could be discussed in this document. The final few sessions of the Roundtable focused on reviewing this draft document and making corrections and additions for accuracy, clarity, and usefulness.

The Roundtable proved essential in the development of this guide. Participants generously shared their experiences and insights and contributed useful case studies and examples, which appear throughout this document. In addition, Roundtable members identified real-world technical, financial, logistical, and organizational challenges for this guide to highlight and, where possible, offered ideas for addressing those challenges. The graphic design concept of the guide was developed by MABU, a Native American–owned marketing and design firm

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Cover photo of wild rice in wetland by Roz Hawley.

List of Acronyms

BIA:
Bureau of Indian Affairs

CEF:
Core Elements Framework

CSKT:
Confederated Salish and Kootenai Tribes

CTUIR:
Confederated Tribes of the Umatilla Indian Reservation

CWA:
Clean Water Act

CWSRF:
Clean Water State Revolving Fund

EAB:
Emerald Ash Borer

EPA:
United States Environmental Protection Agency

GAP:
General Assistance Program

GIS:
Geographic Information System

GPS:
Global Positioning System

GPTWA:
Great Plains Tribal Water Alliance, Inc.

ITEK:
Indigenous Traditional Knowledge

IK/TEK:
Indigenous Knowledge/Traditional Ecological Knowledge

MDT:
Montana Department of Transportation

NAWM:
National Association of Wetland Managers

NPS:
Nonpoint Source

NRCS:
Natural Resources Conservation Service

NWCA:
National Wetlands Condition Assessment

NWI:
National Wetland Inventory

PGP:
Programmatic General Permit

PNW TWIG:
Pacific Northwest Tribal Wetlands Working Group

PRW:
Potentially Restorable Wetland

RAM:
Rapid Assessment Method

RFA:
Request for Applications

RGP:
Regional General Permit

SMC:
Stockbridge-Munsee Community

SPGP:
State Programmatic General Permit

TAS:
Treatment in a Similar Manner as a State

TEK:
Traditional Ecological Knowledge

USACE:
United States Army Corps of Engineers

USFWS:
United States Fish and Wildlife Service

WESP:
Wetland Ecosystem Services Protocol

WI TWWG:
WTCAC Tribal Wetland Working Group

WOTUS:
Waters of the United States

WPDG:
Wetland Program Development Grant

WPP:
Wetland Program Plan

WQS:
Water Quality Standards

WRP:
Water Resources Program

WTCAC:
Wisconsin Tribal Conservation Advisory Council

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I. Introduction

This document, *Protecting Waters and Wetlands in Indian Country: A Guide for Developing Tribal Wetland Management Programs*, is for tribes interested in managing and protecting wetlands and waters in Indian Country. To support tribal sovereign nations in this effort, the U.S. Environmental Protection Agency (EPA) has funded the development of this guide as a supplement to the National Association of Wetland Managers (NAWM) 2013 *Wetland Program Plans Handbook: A Resource to Assist States and Tribes in Developing Strategic Approaches to Achieve Comprehensive Wetland Programs*.[1]

While each tribe has its own unique story, language, and history, all share an abiding and deep-rooted connection to the land. Wetlands and other waters play an important role in ecological functions and cultural uses for tribes. Aquatic habitats provide diverse species of plants, fish, and wildlife, which are used to provide a great variety of food, fibers, and medicines. There are as many native words for water as tribes themselves. Some made their way into the English language, like the Cree *maskēk*, meaning "swamp," which gave us "muskeg." Historically, tribes would have had little need to think about protecting or restoring wetlands and waters because the traditional ways of life did not threaten these resources. However, living in constant touch with the natural world resulted in an extraordinary accumulation of empirical knowledge and experience. While some traditional ways sadly have been lost due to the diaspora and displacement of many tribes from their ancestral grounds, much has been faithfully passed down from one generation to the next.

A Water Sampler

Different terms for water in different languages

- *A-ma (Cherokee)*
- *Chúush (Yakama)*
- *Ka'l (Quinault)*
- *Kuuyi (Hopi)*
- *Mahpe (Northern Cheyenne)*
- *Mni (Lakota)*
- *Nec (Northern Arapaho)*
- *Nibi (Ojibwe)*
- *Nîpîy (ᓂᐱᐩ) (Cree)*
- *Ohki (Blackfeet)*
- *Tó (Navajo)*

A prairie pothole in the Mission Valley of the Flathead Indian Reservation. Photo courtesy of Tabitha Espinoza.

Current tribal efforts to protect wetlands in part reflect these long-term historical relationships and the diversity of tribes across the country. Tribes differ markedly in the number of members, size and contiguity of landholdings, climate and geography, extent and nature of aquatic resources, environmental challenges and threats, and financial circumstances. Tribal efforts to protect wetlands and other waters vary widely, ranging from informal actions to developed, multi-faceted programs. Technical capacity and programmatic development also vary, with some tribes protecting wetlands comprehensively and others working on assembling the components of a basic wetland protection program. While some tribes have EPA-approved Wetland Program Plans (WPPs), many do not. Likewise, some tribes have EPA-approved water quality standards and some have obtained treatment in a manner as a state for Clean Water Act section 401 water quality certification. Increasingly, tribes have combined western science with Indigenous science and Indigenous Knowledge/Traditional Ecological Knowledge (IK/TEK) to protect aquatic resources, either as part of an EPA-approved WPP or within their own framework. They find this maximizes the well-being of their peoples and safeguards important cultural practices while sustainably managing and restoring wetlands and aquatic resources. For a discussion of IK/TEK, see Section III.A.

1 The 2013 NAWM handbook was authored by the "Association of State Wetland Managers," NAWM's name until early 2022. It is available at https://www.nawm.org/pdf_lib/wetland_program_plans_handbook.pdf

"Native scholar Greg Cajete has written that in Indigenous ways of knowing, we understand a thing only when we understand it with all four aspects of our being: mind, body, emotion, and spirit. I came to understand when I began my training as a scientist that science privileges only one, possibly two, of those ways of knowing: mind and body. But it is a whole human being who finds the beautiful path."

—Robin Wall Kimmerer, Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge and] the Teachings of Plants

A. Need for This Guide

This guide aims to augment the 2013 Wetland Program Plans Handbook by the National Association of Wetland Managers (NAWM),[2] which provides a sound foundation and contains much information that may be useful to the tribes. To supplement the NAWM Handbook, the tribes asked for a document specifically designed to assist them with their strategic wetland resource planning and management, including guidance relevant to the unique tribal situations and more accessible for the tribal reader. In particular, tribal members of the Roundtable recommended that this guide include ways of addressing the role of Indigenous Knowledge and Traditional Ecological Knowledge (IK/TEK), as well as the core elements of a wetland program as identified by EPA. In addition, tribes recommended that this supplemental handbook address a broader framework for adding other priority elements that tribes may consider when developing wetland programs, such as elder- youth educational programs, outreach, or identifying potential program funding opportunities.

Many tribes have expressed strong interest in strengthening technical skills and programmatic capacity to increase on-the-ground protection of wetlands and other aquatic resources. At the same time, tribes have described a number of financial, technical, and programmatic issues and challenges. These complications can arise from uncertain and fluctuating funding, as well as technical hurdles that can make obtaining and managing data, including GPS information, difficult. In addition, tribes have cited ongoing and increasing threats to wetlands and other water resources, including invasive species, hydrologic manipulation, erosion and channelization, and long-term impacts from climate change. Many of these threats, in turn, can imperil culturally important resources and places, including sacred sites. Moreover, tribes face distinct issues related to tribal sovereignty, complicated relationships with other jurisdictions (e.g., federal, state, intertribal), and unique tribal governmental procedures, polices, and mission statements.

B. Organization and How to Use

Although a free-standing document, this guide is best used in conjunction with the NAWM Handbook. This guide is organized into four sections:

- **Section I:** Introduces this guide, highlighting the importance of wetlands to many tribal cultures and the variation among tribal wetland protection programs
- **Section II:** Summarizes the foundational components of this guide—the Core Elements Framework (CEF), WPPs, and Wetland Program Development Grants (WPDGs).
- **Section III:** Describes the key considerations that apply to tribes, such as the cultural values and uses of wetlands, IK/TEK, wisdom and practice, strategic considerations in the tribal context, ways of taking advantage of the CEF, and decision-making.
- **Section IV:** Reviews some existing or potential areas for assistance, including the WPDG program, intertribal cooperation efforts such as the Pacific Northwest Tribal Wetlands Working Group, and partnerships of various kinds.

Each section contains links in the text or footnotes where readers can obtain more detailed or technical information about particular topics.

Throughout this guide numerous examples, case studies, photographs, and graphics enliven the descriptions in each section. The case studies highlighted in boxes provide additional insights about the topic under

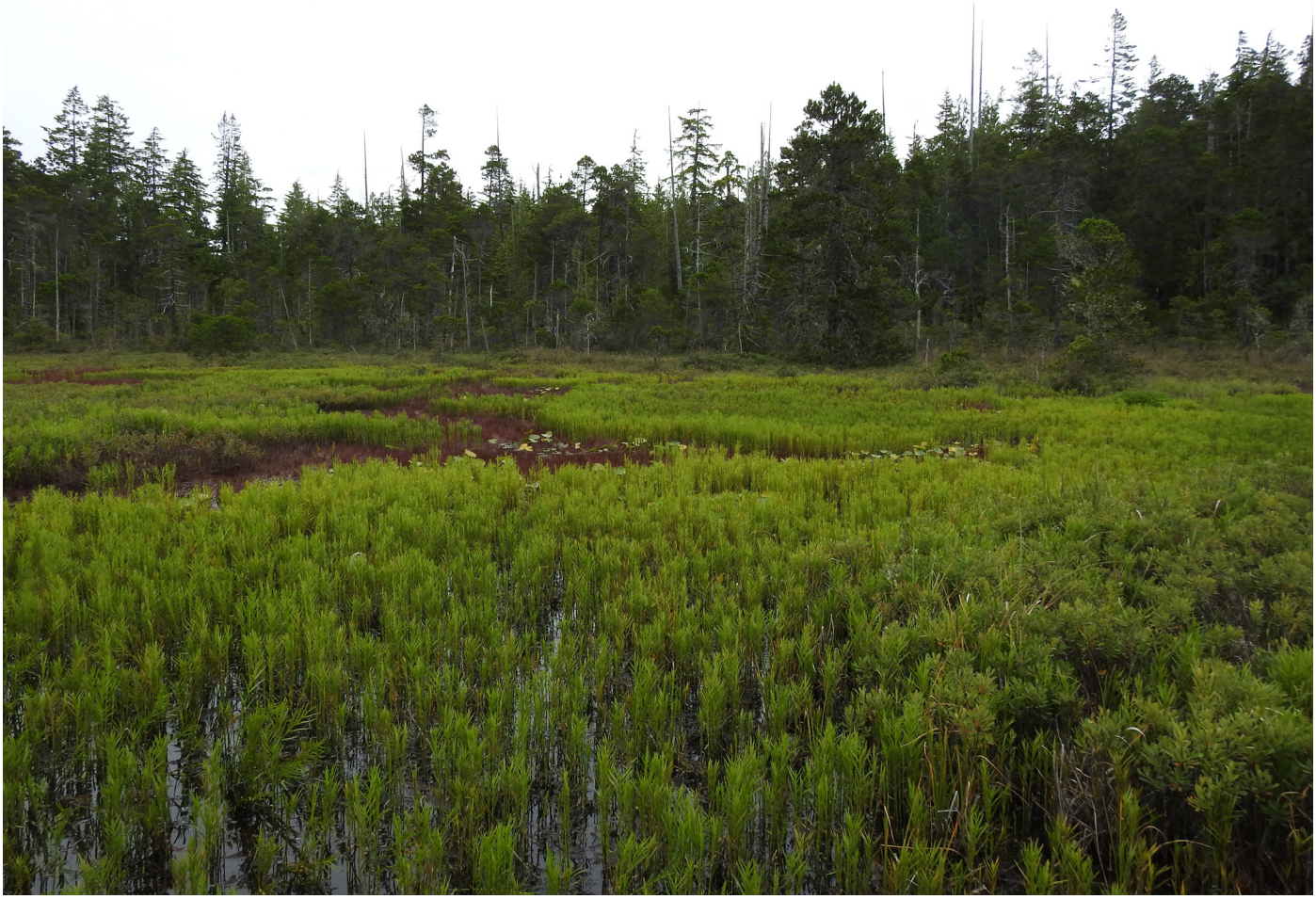
2 National Association of Wetland Managers. 2013. Wetland Program Plans Handbook: A Resource to Assist States and Tribes in Developing Strategic Approaches to Achieve Comprehensive Wetland Programs. https://www.nawm.org/pdf_lib/wetland_program_plans_handbook.pdf.

discussion. Several case studies illustrate the multiple dimensions of tribal wetland protection and management program efforts. In addition, the end of each section includes some issues and challenges that tribes have raised either in the past or during the development of this document, presented in a question-and-answer format.

This guide also includes a series of appendices that provide a list of the Roundtable members, various case study summaries, a funding matrix, and a list of selected resources for readers wanting additional information.

There is no prescribed way to read or use this guide. Readers new to tribal wetland protection efforts might want to move through the topics in order. Readers familiar with the CEF, WPDG, and WPP development may wish to focus on the case studies and the question-and-answer sections or scan the table of contents to find what is of interest, keeping in mind that tribal efforts to protect and manage wetlands are multi-faceted, interdisciplinary, and symbiotic.

Diverse habitat structure peat system, or Pacific Northwest coastal prairie, with lodgepole pine (*Pinus contorta*) buffer and emergent and aquatic bed plant communities. Photo courtesy of Linda Storm.



II. Getting Started: Some Basics

Tribes throughout the United States vary dramatically in membership size, extent and contiguity of landholdings, geography and climate, quality and quantity of aquatic resources, environmental challenges, relationships with states and other tribes, financial conditions, and historical circumstances.[3] Some tribes have professionally staffed natural resource departments with multiple areas of expertise, while others have few trained personnel or limited technical capacity. Consequently, tribal efforts to safeguard wetlands range from informal approaches to more developed, multi-faceted programs. The same is true for program development: some tribes have comprehensive wetland protection programs and others are assembling the components of basic programs.

Given these many factors, there is no one prescription to follow in developing and implementing a wetland protection strategy. The best approach will be tailored to the unique opportunities and challenges for each tribe. In addition, the programmatic needs and focus will change as a wetland management program develops. A tribe in the early stages may focus primarily on mapping and characterizing resources. In contrast, an established program may seek to fill gaps and pursue longer-term strategies such as sustaining wetland protection, implementing long-term restoration strategies, integrating community education and training, or more fully incorporating a tribe's specific Indigenous Knowledge and Traditional Ecological Knowledge (IK/TEK) into its program.

While the wetland program "recipe" will vary, the U.S. Environmental Protection Agency (EPA) encourages tribal wetland managers to be familiar with several common foundational tools or resources. These include the 2013 Wetland Program Plans Handbook by the National Association of Wetland Managers (NAWM), the Core Elements Framework (CEF), and the range of existing state and, especially, tribal Wetland Program Plans (WPPs).

Some Factors Informing Program Development

- Extent and characteristics of aquatic resources.
- Nature and severity of aquatic resource threats.
- Existing technical expertise.
- Staffing considerations.
- Availability of funds.
- Possible partnerships and leveraging opportunities.
- Tribal governance structure.
- Relationships with state and federal governments.
- Cultural values and priorities.
- TEK.

A. The 2013 NAWM Handbook

The 2013 NAWM Handbook provides states and tribes with information about how to develop an EPA-approved WPP. WPPs are voluntary plans developed and implemented by states or tribes that typically describe strategic approaches for wetland program management, protection, and restoration over time. WPPs can establish priorities, set program development goals, and provide states and tribes with a blueprint for future action. The NAWM Handbook includes information about the different components that can be part of a plan and explores how a state or tribe might develop a plan in light of the dramatic variations among both states and tribes.

The NAWM Handbook consists of four major sections: an overview of the planning process, a discussion of each of EPA's core elements that may be part of a WPP (which are identified as key elements for a comprehensive wetland program), consideration of effective communication approaches, and information about program funding. The NAWM Handbook includes references at the ends of sections, and appendices provide supplemental information that directs readers to reports, webpages, and other resources for more information. Tribal wetland managers, while acknowledging the usefulness of the NAWM Handbook, have recognized that its broad scope limits its capacity to focus on tribe-specific issues.

3 A "federally recognized Tribe" is an American Indian or Alaska Native tribal entity with a government-to-government relationship with the United States. Federally recognized tribes possess certain inherent rights of self-government (tribal sovereignty) and are entitled to receive certain federal benefits, services, and protections because of their special relationship with the United States. At present, there are 574 federally recognized American Indian and Alaska Native tribes and villages.

Early morning fog approach in a boat to the National Wetland Condition Assessment Elk River salt marsh monitoring site, with fir trees (*Pseudotsuga menziesii*) in the salt marsh and a tidal river channel. Photo courtesy of Linda Storm

B. EPA's Core Elements Framework

While each tribe has its specific mix of factors that inform its approach (see box on the previous page), a recurring set of goals and program objectives underpins most comprehensive wetland programs. EPA has summarized these factors in the "Core Elements of Effective State and Tribal Wetlands Programs," also called the CEF.[4] Developed with input from states and tribes, the CEF outlines the critical components of a state or tribal wetland program and provides a comprehensive description and example table or menu of program-building activities for each core element.[5] EPA's purpose in developing the CEF is to increase the understanding of what constitutes a comprehensive wetland program and to encourage a strategic approach to developing wetland programs. The CEF offers an array of actions and a menu of activities from which tribes can create their own approach to wetland protection and management. It does not reflect an expectation by EPA that tribes should develop activities under all core elements; rather, tribes should use the CEF to support their individual program goals and available resources. Tribes may also add additional elements to their programs, such as outreach and education, sustainable financing/funding, or other important priorities. Examples can be found in the Pyramid Lake Paiute and Stockbridge-Munsee case studies in Appendix B.

EPA's CEF describes four components of a comprehensive wetland program:

- Monitoring and Assessment: Document and track changes in wetland acreage and condition;
- Regulatory Approaches: Permit, mitigate, and enforce;
- Water Quality Standards for Wetlands: Set benchmarks for wetlands conditions; and
- Voluntary Restoration and Protection: Increase wetland acreage and quality.

The CEF defines each core element and describes the goals and potential benefits. It also provides a table with possible program-building actions that can help tribes achieve each core element's objectives which generally correspond to a stage of program development.[6] A suite of activities a tribe can consider implementing based on its individual program goals, available resources, and needs. Tribes can mix and match steps from different sections based on their situation. For example, a tribe may have a well-established monitoring and assessment program while also being in the early stages of developing water quality standards for wetlands.

While this guide presents all four core elements in this basic format, each element also has its own particular set of activities. For many tribes, the Monitoring and Assessment core element is an essential and practical first step in developing a wetlands program. First, it is key to inventory and map wetlands and their geographic distribution and extent. Then, gathering information on the different types of wetlands, and their potential cultural values and ecological functions, is helpful. Knowing the current geographic location, size, and type of wetlands under tribal jurisdiction may be a prerequisite for effectively addressing actions and activities under the other program elements for how to protect, manage, and restore wetlands. The Regulatory Activities core element offers potential starting points for a regulatory program, such as a clear jurisdictional scope, a method to authorize impacts to aquatic resources, and a method for ensuring compliance. The Voluntary Restoration and Protection core element identifies many activities that can foster partnerships with state or federal agencies, other tribes, and nongovernmental organizations that support program activities (e.g., wildlife protection programs, invasive

4 For a detailed treatment of the CEF, refer to the 2013 NAWM Handbook and information provided by EPA at https://www.epa.gov/wetlands/core-elements-effective-state-and-tribal-wetland-programs

5 The CEF applies to states as well as tribes even though this guide, in keeping with its purpose, primarily references tribes.

6 See https://www.epa.gov/sites/default/files/2015-10/documents/2009_03_10_wetlands_initiative_cef_full.pdf

species control, cooperative ventures, or land acquisition programs). The Water Quality Standards for Wetlands core element often begins with monitoring wetland resources to gather sufficient data to establish defensible regulatory benchmarks.

Note that the four elements are not stand-alone silos but mutually reinforce one another. For example, monitoring and assessment activities will inform how to approach the other three elements by ensuring status and condition of the wetland resource is well-understood. Likewise, water quality standards for wetlands area vital tool that can provide a benchmark for activities under the regulatory activities core element, including the use of the Clean Water Act (CWA) section 401 certification authority to condition federal permits or licenses in Indian Country.

These core elements, defined with state and tribal input, provide a logical foundation for program development and implementation. Some tribes will opt to invest effort in all four core elements, while other tribes may focus on two or three areas. At the same time, tribes may also choose to add other elements into their WPPs, either in addition to, as part of, or in lieu of the four core elements identified by EPA. Additional considerations could include developing partnerships, education programs, or climate change adaptation measures, as well as integrating IK/TEK or other cultural knowledge, practices, and considerations into wetland management actions and activities.

EPA also encourages tribes to use the CEF to help guide decisions around securing and allocating funds for wetland programs. Securing the necessary financial resources is a fundamental and sometimes challenging aspect of developing and sustaining wetland programs. However, EPA offers grant and technical assistance programs to support tribes pursuing wetland program development (see Section IV, "Getting Help").

C. Wetland Program Plans

WPPs are voluntary plans developed and implemented by tribes that describe what the tribes want to accomplish over time. Most WPPs include priorities, program goals, objectives, and activities. WPPs provide tribes with a blueprint for future action as well as a basis for assessing progress. A good WPP will be tailored to the unique opportunities and challenges that a given tribe faces and provide recommendations forward. Wetland programs vary dramatically among both tribes and states. While there is no prescribed time period, plan outcomes. Plans with longer timeframes are often most beneficial as a tool for planning and communication inside the tribe, across tribal departments, and with EPA.

Tribal WPP Components

- Context (e.g., existing efforts, tribal culture and history).
- Goal statement and objectives.
- Overall plan timeframe (typically 3–6 years).
- Core elements from the CEF.
- Additional tribe-specific elements.
- Specific actions to advance each element.
- Schedule for each action and metrics for tracking each action.
- Relevant partnerships (e.g., state or federal agency, intertribal).
- Funding strategy.

While WPPs do not have to follow a set format, they typically include certain minimum components (see box above). WPPs normally will include one or more of the core elements outlined in the CEF, and tribes are encouraged to add other elements (e.g., sustainable financing) as appropriate. Potential activities under the Voluntary Restoration and Protection core element, for example, could include (but are not limited to) providing technical assistance to community members and/or landowners on how to identify and protect wetlands; developing an invasive species control program; identifying community outreach and communication strategies about wetland protection priorities; taking direct wetland protection actions through acquisition and easement programs; and developing educational curricula about wetland functions, cultural values, and IK/TEK.

WPPs don't need to be elaborate, complicated documents. It is recommended that the WPP concisely identify planned actions to create a focused and sustainable wetland program. However, it is up to the tribal wetland program staff working with its government and other partners to determine the process, priorities, and contents of their WPP. The plan should assess current and future challenges and opportunities; and identify wetland protection, restoration, and management priorities. Tribes with EPA-approved WPPs are more favorably

Eagle Marsh in Grand Portage looking into Canada in the background. This water body has water control structures that were put in place to try and create more habitat for wild rice. Photo courtesy of Vallen Cook.

positioned for certain funding opportunities. For example, the request for applications (RFA) for Wetland Program Development Grants (WPDGs), both from the EPA regions and the national tribal set-aside, describes two funding tracks. Applicants with current WPPs, or who are developing WPPs, are eligible to receive funding under the usually better- funded Track One (see discussion of WPDG Track One and Two funding in Section IV.A, "Wetland Program Development Grants").

EPA regional offices review WPPs, and EPA publishes approved plans on its website.[7] This webpage includes the name of the tribe or state that developed the WPP, a link to the WPP itself, the years covered by the WPP, and the core elements covered as part of the WPP. EPA provided further details about the content of WPPs and the submission, review, and approval process in an October 2009 memorandum, also posted on its website.[8]

Tribes that have completed WPPs have reported several benefits. The WPP helps focus efforts on actions most likely to benefit wetland resources. In many cases, a WPP can help create new and stronger partnerships, as well as increase support from tribal governments and the public for wetland protection.

WPPs can serve as a helpful tool for communication about wetland program management priorities and activities between tribal program staff and managers and with tribal community members. They also can provide continuity if there is staff turnover. Tribes that have benefited the most from developing WPPs have plans that include ways to measure or evaluate success. Some tribes include a funding strategy in the WPP to ensure they can sustain their programs. At its best, a WPP provides the opportunity to articulate the steps that can be taken to ensure current and future generations of humans, fish, plants, and wildlife enjoy the benefits of healthy wetland ecosystems and places.

A review of EPA-approved tribal WPPs reveals a diverse array of interests and approaches in keeping with the unique circumstances of different tribes (e.g., geography, history, aquatic resources, environmental threats), as illustrated by the small sampling of excerpts below.

7 https://www.epa.gov/wetlands/state-and-Tribal-wetland-program-plans#r1
8 https://www.epa.gov/wetlands/2009-wetland-program-plan-memorandum

Tribal WPPs Focus on Diverse Sets of Interests

(Selected Excerpts from Tribal WPPs)[9]

*The **Blackfeet Environmental Office** will develop a comprehensive strategy to protect, maintain and restore wetlands and aquatic resources on the Blackfeet Reservation for the Blackfeet People. These resources also serve as important storage and discharge points for the Upper Missouri River watershed within the United States and the Milk and Saint Mary River watersheds, which represent international waters flowing into Canada.*

*The goal of the Wetland Protection Program for the **Hualapai Tribe** is to maintain or increase wetland area, to maintain or enhance wetland function, to establish wetland parameter databases and to identify wetland areas in need of protection and/or restoration. We will use the products produced to identify land use activities that may affect wetland area and health, identify wetlands for protection and restoration activities, and understand the potential effects of climate change on wetland integrity of the Hualapai Reservation.*

***Northern Cheyenne** Tribal members use certain wetland and riparian plants for medicinal and cultural purposes… Utilizing an ethno-botanical approach, a list of plants that are of significant cultural value was developed through personal interviews with elders. Many of these plants are hydrophytic, and therefore are located within wetland or riparian habitats.*

*The **Wiyot Tribe** respects and honors its wetland resources, biodiversity, and the functions and values they provide presently and for future generations. The Tribe will make efforts to restore their wetlands to their authentic and fully functioning state… The Wiyot Tribe plans to develop its wetland program through continued monitoring and assessment of wetland resource condition to ensure wetland protection…. [and] use this information to improve understanding of baseline wetland condition, develop benchmarks for wetlands restoration, inform development of wetland-specific water quality standards, and to prioritize wetland restoration and protection activities.*

*The **Yurok Tribe**… is dedicated to the inventory, monitoring, assessment and protection of wetlands within the Yurok Reservation. This Wetlands Program Plan should be considered an Adaptive Management Plan, one that will be updated, as needed, based on emerging data and analysis… Plan development will use traditional ecological knowledge; fisheries and watershed programs experience and expertise; and our own departmental expertise in water quality, environmental*

monitoring, bioassessments, and environmental regulation to contribute to restoration of the Klamath River and its fisheries.

*The overall vision statement and goal for this [**Coeur d'Alene**] WPP is: The earth gave grandmother the knowledge to live with the people, animals, and plants. This knowledge is to be used for our highest benefit, in turn, it will benefit all. Our lands are essential to our way of life. Our vision is to educate and conserve our wetlands. Our goal is to protect, restore, and enhance our wetlands. Our actions will assure that our cultural heritage will continue into the future.*

9 WPPs can be found at: https://www.epa.gov/wetlands/state-and-tribal-wetland-program-plans#1.

D. Questions and Answers

Are the CEF and WPP mainly aimed at less developed tribal programs?

While support is available to all tribes, including tribes with developed wetland management programs, EPA maintains a key focus on tribes actively working to begin or further build small or "starter" programs. These tribes often depend the most on EPA funding and technical assistance. However, EPA assists developed programs as well. The CEF includes objectives and associated program-building activities that tribes can use to refine more fully developed programs.

Does the CEF have a technical assistance component?

The CEF clearly defines four core elements and outlines a menu of program activities under each. EPA seeks to align its technical assistance—including regional staff technical assistance time, targeted trainings, and outreach—to support interested tribes. The CEF helps EPA track specific program-building actions and can help in tailoring assistance to areas where a significant number of tribes are working.

When and how will EPA use the CEF in grant decisions?

WPDGs are EPA's primary source of financial support for tribal wetland programs. EPA aligns the WPDG with the CEF to emphasize program development. EPA uses the CEF to guide program development elements and asks grantees to reference the CEF in their proposed grant applications and description of activities. See Section IV below for a more detailed discussion of the WPDG program.

How can tribes do all the activities listed in the CEF without additional funding?

Tribes are not required or expected to undertake all activities in the CEF. The CEF is both broad and flexible. While it provides a comprehensive menu of suggested program-building activities to draw from, there is no expectation that a tribe will pursue all the core elements or all the activities under one core element. Tribes may choose the activities best suited to help them meet their program goals. For example, most tribes begin with the Monitoring and Assessment core element because having information about the type, distribution, and abundance of wetlands, and their conditions or functions, is key to supporting other elements of a wetland program. In addition, EPA will help develop and support other intertribal information-sharing networks, as well as target EPA resources to provide specific training and technical support for program-building activities under the CEF.

III. Protecting Wetlands: Ingredients for Tribal Programs

This section outlines five critical components for protecting and managing wetlands and other aquatic resources: incorporation of cultural values and Indigenous Knowledge/Traditional Ecological Knowledge (IK/TEK); mapping, monitoring, and assessment; regulatory approaches; water quality standards for wetlands; and voluntary restoration and protection. These components can be mixed and matched to best meet the circumstances and needs of any particular tribe. Examples of how tribes have worked with these components, individually or in combination, are provided below.

A. Incorporating Cultural Values and Indigenous Knowledge/Traditional Ecological Knowledge

IK/TEK is the knowledge held by Indigenous cultures about the environment, the cultural practices that build on that knowledge, and the evolving relationship between humans and the natural world. It includes knowledge, practices, and beliefs that have developed over generations and in some cases centuries or millennia, passed down through storytelling, songs, dance, and ceremonies. IK/TEK is rich in history, culture, and ecological wisdom, and it is important to a tribal community's health and welfare, and ultimately to its survival. Critical aspects of tribal identity are interwoven within the concept of IK/TEK, creating a powerful blend of social, cultural, and environmental wisdom that gives the community a path forward and the resilience to adapt to change and challenges that lie ahead. Practically, IK/TEK offers techniques and stewardship principles to guide all activities within the natural world, including ecosystem management practices, as well as hunting, fishing, plant collection, cultivation, harvesting, and forestry.

Wetlands and other water resources hold an essential place within IK/TEK. Tribes recognize the critical role of these resources in maintaining the health and welfare of both tribal members and the community itself. Wetlands and other water resources nurture healthy, traditional foods; plants used for medicinal, healing, and ceremonial purposes; reeds, grasses, and other plant materials for weaving baskets and making textiles; and fish and wildlife for food and recreation. In addition, IK/TEK may offer guidance in cleaning wetlands contaminated by a variety of pollutants. The health of these resources affects every aspect of tribal life.

IK/TEK and western science share some important fundamental beliefs, such as a desire to make sense of the world around us, the importance of practical and curiosity-driven investigations to learn better practices, and the need to continuously update information as conditions and knowledge change. There are also differences. In general, western science strives to be objective and avoid value judgments, often isolating objects of study in controllable experimental environments. IK/TEK, on the other hand, reflects local environmental and cultural contexts and links the social, spiritual, cultural, and natural systems to support and sustain community well-being.[10] There are times when the two systems are at odds, but more often, they complement each other, providing important information and perspectives that help create a richer and more robust picture of the natural world and its relationship with human activity.

Other terms linked with IK/TEK or used to describe or elaborate on the concept of IK/TEK include:

- Traditional ecological knowledge and wisdom
- Traditional knowledge
- Indigenous science/knowledge
- Native science/knowledge
- Cultural values

With an increase in partnerships between tribes and non-tribal agencies and entities, tribal leadership and staff are often faced with the important and sometimes challenging task of educating their potential partners about the meaning and role of IK/TEK in their culture. Often, they must do so while honoring the confidentiality of sensitive cultural information and respecting the privacy of tribal members. Working with state, local, and

Dogbane (*Apocynum cannabinum*) along the Clearwater River on the Nez Perce Reservation—a plant used to make cordage, baskets, and other fiber materials. Photo courtesy of Rue Hewett Hoover.

10 See, e.g., USGS, Traditional Ecological Knowledge *TEK): An Introduction and discussion of TEK's Potential to Inform Adaptive Management, Presentation (2012), available at: https://www.usbr.gov/uc/progact/amp/twg/2012-04-16-twg-meeting/Attach_03c.pdf.

"We've made assertions that have been accepted, that the best available data includes traditional knowledge, includes Indigenous science… It's really revolutionizing the way in which decisions are made and who gets a seat at the table, and creating a space for Indigenous knowledge holders to be respected in these governing processes."

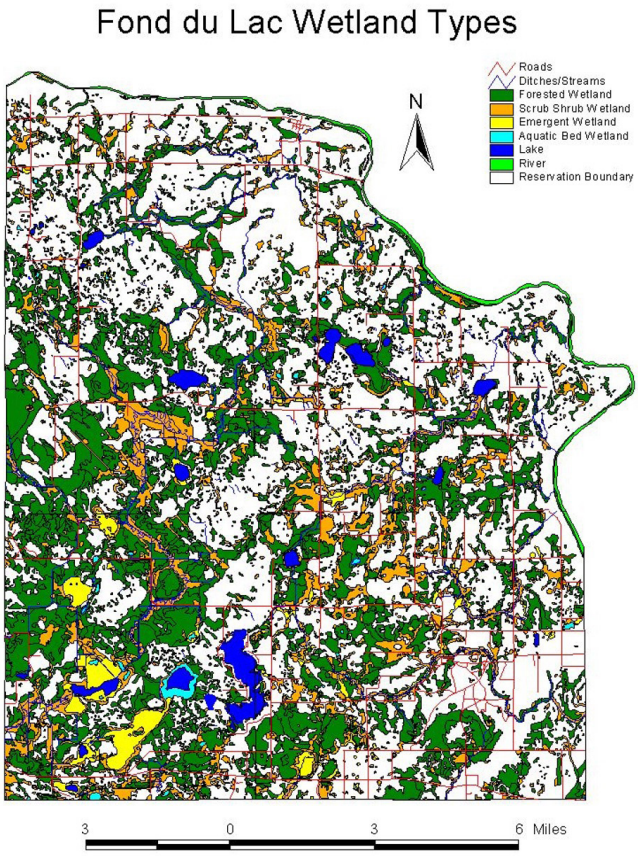
—Kelsey Leonard, Shinnecock Nation

federal agencies and institutions, as well as other partners, tribal leadership may propose creative options for wetlands management and protection. For the collaboration to succeed, partners may need to create more flexible and appropriate mechanisms for funding, sustaining programs, and protecting and nurturing wetland ecosystems and aquatic resources. There are significant examples of this kind of partnership, as well as policy priorities to acknowledge the critical importance of Indigenous knowledge and IK/TEK. For example:

- On November 15, 2021, the White House Office of Science and Technology Policy and Council on Environmental Quality released a memorandum to initiate new federal guidance on Indigenous Traditional Ecological Knowledge (ITEK), which commits to elevating ITEK in federal scientific and policy processes. The memorandum describes ITEK as a body of observations—including oral and written knowledge, practices, and beliefs—that promote environmental sustainability and responsible stewardship of natural systems through human-environment relationships across biological, physical, cultural, and spiritual systems. The White House announcement and memorandum can be found at https://www.whitehouse.gov/ceq/news-updates/2021/11/15/white-house-commits-to-elevating-indigenous-knowledge-in-federal-policy-decisions/ and https://www.whitehouse.gov/wp-content/uploads/2021/11/111521-OSTP-CEQ-ITEK-Memo.pdf.
- On December 1, 2022, the White House Council on Environmental Quality (CEQ) and the White House Office of Science and Technology Policy (OSTP) jointly released a new government-wide guidance and an accompanying implementation memorandum for federal agencies on recognizing and including Indigenous Knowledge in federal research, policy, and decisionmaking. The guidance and memorandum respond to the 2021 OSTP-CEQ memorandum discussed above, and can be found here and here.
- The Nez Perce Tribe in Idaho worked with Dr. Paul Adamus to adapt his functional assessment tool, the Wetland Ecosystem Services Protocol (WESP), to incorporate TEK. The new tool adds the tribe's cultural functions and values to the existing ecological data in WESP. Incorporating the cultural component into the tool raises the rated value of each wetland based on cultural importance. This assessment tool, which includes ecological and cultural attributes, was badly needed by the Nez Perce Tribe to prioritize and describe restoration projects more appropriately. *Read the full case study here*.
- The U.S. Environmental Protection Agency (EPA) is aware of the unique role of IK/TEK in tribal resource management, has modified some requirements for Wetland Program Plan (WPP) approval, and now encourages partnering with both governmental and private-sector entities for more broad-based programs with multi-faceted approaches, including the incorporation of IK/TEK in all phases of program planning. EPA has been working to respond to the needs of tribes, making their grant- making process more streamlined, and encouraging partnerships and collaborations in seeking grants.
- The Pacific Northwest Tribal Wetlands Working Group has used EPA funding to form an effective tribal-led collaboration, now over ten years old. Tribes share challenges and solutions; they conduct joint trainings, fieldwork, and resource sharing to strengthen and nurture each member tribe's capacity to protect and manage wetlands.[11] *Read the full case study here*.

In recent years, presentations, webinars, and conferences have brought tribal IK/TEK practitioners together with agencies, academics, and others to exchange knowledge and increase understanding (examples included in Appendix D). Today, many federal agencies have IK/TEK policies, including: the EPA; the U.S. Forest Service; the Advisory Council on Historic Preservation; and several bureaus and offices within the Department of the Interior, such as the Bureau of Indian Affairs, the Bureau of Reclamation, the U.S. Fish and Wildlife Service (USFWS), the National Park Service, the U.S. Geological Survey, and the Bureau of Ocean Energy Management.

11 See additional discussion about the Pacific Northwest Tribal Wetlands Working Group on pages 56–57 of this document.



Map of Fond du Lac wetland types. Courtesy of Rick Gitar.

B. Monitoring and Assessment

The Roundtable Workgroup recommends that developing an effective wetland management program should begin by taking stock and conducting an inventory of some kind. The Workgroup also recommends some common questions to ask, such as: Where are wetlands located? How many are there? How large or small are they? What types of wetlands are there? How do they relate to each other ecologically, with the underlying hydrology, and with other landscape features?

The next step is to assess wetland conditions and trends. What natural resource functions do the wetlands provide? What are their cultural uses and values? Are they healthy or functioning well, or are they impaired in one or more ways? What trends can be observed in terms of recovery or further degradation?

Wetland monitoring and assessment programs can allow tribes to establish a baseline about the extent, condition, function, and observable trends of aquatic resources.

Monitoring and assessment play a foundational role in the other components of wetland programs. For example, regulatory programs may rely on monitoring to detect whether unauthorized actions are occurring, evaluate alternatives to avoid and minimize impacts, determine whether permittees are complying with conditions in Clean Water Act (CWA) section 401 water quality certifications, and evaluate the cumulative impacts of permitted actions. Tribes can use monitoring and assessment data to determine compliance with water quality standards (WQS) or to establish baseline data to develop wetland-specific WQS. Monitoring and assessment information also helps identify priority wetlands for protection or restoration efforts and shape educational programs about wetlands. Finally, by integrating wetland monitoring data with information on other aquatic resources, monitoring and assessment strategies can become an important bridge between wetlands and other tribal water programs.

Monitoring involves collecting data, making observations, and recording information about existing and changing conditions, while assessment is the use of the collected data to support decision-making and planning. EPA refers to a three-tier framework for wetlands monitoring and assessment.[12] Most tribes draw on one or more of these tiers when designing and implementing their wetlands monitoring programs.

Level 1 consists of landscape assessments, which rely on coarse landscape-scale inventory information, typically gathered through remote sensing and stored in a geographic information system (GIS) format. This approach involves identifying wetland location and class or type using available information such as National Wetland Inventory (NWI) Maps, characterizing wetlands in terms of their position in the landscape (using hydrogeomorphic classification[13]), and characterizing areas that surround wetlands using landscape metrics (e.g., percent forest cover, land use category such as agricultural, residential, or commercial).[14] Assessment results can provide a rough gauge of wetland condition within a watershed at the landscape scale.

12 See https://www.epa.gov/wetlands/wetlands-monitoring-and-assessment for more information on EPA's Level 1, 2, and 3 for monitoring wetlands.

13 Hydrogeomorphology is a science that deals with occurrences of water with respect to landform. Hydrogeomorphology of a drainage basin is a function of rainfall kinematics, surface topography, drainage basin morphology, and runoff, among other factors.

14 See Brinson et al.'s 1993 hydrogeomorphic classification method (https://wetlands.el.erdc.dren.mil/pdfs/wrpde4.pdf), later modified by Smith et al. in 1995 (https://apps.dtic.mil/sti/citations/ADA307121).

Wetland monitoring during 2021 National Wetland Condition Assessment. Photo courtesy of Linda Storm.

Level 2 is the "rapid assessment" level of monitoring, where tribes make site-specific field observations using relatively simple metrics or measures to assess wetland condition or functions) based upon readily observable information at the wetland site scale. Typically, these methods involve identifying both the hydrogeomorphic class and Cowardin NWI class[15] of the wetland, including observing hydrology and landscape setting, identifying dominant plant community composition, and recording information about habitat structure and the surrounding land-use setting of wetlands. Rapid assessment methods typically produce a score that describes where a wetland generally falls along one or more gradients (e.g., the extent of human disturbance, degree of ecological condition, or integrity).

Because of the more location-specific or regional nature of rapid assessments, numerous rapid assessment methods are currently in use or under development. Regulatory programs have used Level 2 rapid assessments for many years to help evaluate the likely impacts of proposed development or land-use actions. Rapid assessments may also be useful in assessing sites for wetland restoration, management, or protection, or in evaluating the general success of restoration, compensatory mitigation, or land-use management. Some rapid site assessment methods may be developed for specific purposes, such as a region-specific Floristic Quality Assessment method like those used by some federal agencies, states, and tribes.[16] Some Floristic Quality Assessments involve identifying all plant species present and some quantitative sampling to determine relative percent cover of native and non-native species as a measure of wetland quality, which would be Level 3 instead of Level 2 monitoring.

Confederated Salish and Kootenai Tribes | CSKT Monitoring and Assessment

With funding from the EPA Wetland Program Development Grants (WPDGs), the Confederated Salish and Kootenai Tribes (CSKT) Wetland Conservation Program started a comprehensive rotating basin and watershed- based approach to wetland assessment and monitoring in 2004. Due to the competitive nature of this funding source, the program has started and stopped a few times over the years due to resulting staff turnover. As a result, the original strategy has had to adjust. There are seven watersheds on the Flathead Indian Reservation. At present, five of the watersheds have been assessed and monitored twice, allowing for limited trend analyses by comparing baseline data to current data. Completing watershed-based assessments on the two remaining watersheds will enable CSKT to analyze the data for each of the seven sub-basins and begin documenting changes on a larger scale over time. *Read the full case study here*.

Level 3 consists of intensive site assessments and involves a more rigorous approach to collecting data and measuring or assessing wetland condition.[17] Level 3 monitoring typically involves collecting quantitative, site-specific data, including direct and detailed measurements of hydrology, biological communities, soils, and other measures at specific wetland sites. Such detailed and quantitative data collection provides more precise measures for assessing wetland condition and understanding the ecological processes or functions the wetland performs. Sampling may include biological measures such as plant species inventories or amphibian, macroinvertebrate, physical, or chemical monitoring. Level 3

15 See https://www.epa.gov/wetlands/classification-and-types-wetlands#undefined for descriptions of both the hydrogeomorphic and the Cowardin wetland classification approaches. USFWS uses the Cowardin classes of a wetland for their NWI mapping.

16 See for example https://cnhp.colostate.edu/cwic/condition/ecological/ or https://www.ncwetlands.org/project/coefficient_conservatism/ or https://www.dnr.wa.gov/NHP-FQA

17 Note that assessing wetland condition and wetland functions involves somewhat different methodological approaches. Readers wanting more detail can explore tools on the wetland monitoring protocols for addressing biological assessment methodologies under different modules, such as https://www.epa.gov/nutrient-policy-data/nutrient-criteria-development-document-wetlands#wetlands.

monitoring may be done at one time to characterize baseline conditions of wetlands or a population of wetlands, or over longer periods of time. Physical and chemical information is gathered about the landscape setting; how water, nutrients, and sediments enter and exit the site; and other aspects of the surrounding land-use conditions. Such information can characterize the hydrogeomorphic functions and processes at a site. For additional information about one such approach, the Hydrogeomorphic Method, see the Hydrogeomorphic Approach for Assessing Wetlands Functions.

Other program elements may include building geographic information, either through acquiring related map layers (e.g., soils information, digital elevation) or locating special wetland resources (e.g., designated habitat for listed species, cold-water streams, rare wetland types, public lands). The Wetland Mapping Consortium encourages consistent national mapping as defined in the National Wetland Mapping Standards and shares information about innovative techniques and the application of GIS data.[18]

Some tribes have developed specific tools. For example, the Nez Perce Tribe's WESP assessment tool determines the functions and values (both ecological and cultural) of reservation wetlands to make decisions and inform wetland management actions. The tribe uses WESP to identify the functions, benefits, and values of individual wetlands; prioritize wetlands restoration and protection; monitor the long-term effects of wetland restoration; and predict and evaluate impacts from changing rainfall and weather patterns to assist in adaptation to hazards, floods, and droughts. Among other things, WESP helps the tribe design and evaluate future restoration projects.

Taking stream discharge measurements at the Tamarac River to develop nutrient loading and stream rating curves. Photo courtesy of Red Lake DNR Water Resources Program.

Incorporating Traditional Ecological Knowledge and Wisdom in Monitoring and Assessment

The **Tulalip Tribes** emphasize the importance of designing wetland protection efforts around traditional ecological knowledge and wisdom. Inez Bill, Tribal Elder and Rediscovery Program Coordinator for the Tulalip Tribes, noted that "Following our teachings and values, it shows the importance of our environment, how we need to take care of it and protect it and honor it—so it will continue for future generations—to support us." In 2018, the Tribes rebuilt their Wetland and Stream Inventory database to allow for easy editing and tracking, as well as daily updates to all users of the inventory. Across the Tulalip Reservation's 22,567 acres, the inventory captures wetland and deepwater habitats, natural streams, modified natural streams, and artificial streams. Within each wetland polygon, the inventory has a range of data fields, including those for culturally sensitive species and generation of a cultural values score, and cultural notes. Indicators used to develop cultural scores were developed through both a landscape-scale GIS analysis, field-verified with rapid assessment and quantitative data collection, as well as a site-scale wetland cultural values assessment checklist, which includes fields for tribal staff to document plant use, fish/wildlife use, historical use, information about access, and more. Learn more about the Tulalip Tribes' Monitoring and Assessment Program here.

18 See, for example, https://www.nawm.org/134-science/wetlands-one-stop/9350-introduction-to-wetlands-one-stop-mapping and https://www.fws.gov/node/264587

EPA encourages tribes interested in monitoring and assessment programs to pursue three objectives in a sequence that generally corresponds to the stages of program development:

1. Develop a wetlands monitoring and assessment strategy that identifies approaches the tribe will use to manage wetlands in a way that supports their vision and objectives.
2. Implement a sustainable monitoring program consistent with the wetlands monitoring strategy.
3. Incorporate monitoring data into tribal decision-making.

While there is no "cookbook" approach to developing a wetland monitoring strategy, tribes typically identify the methods or approaches they intend to use. A first step is usually a Level 1 inventory of wetlands, often with Level 2 rapid assessment ground-truthing of some representative sample of the wetlands inventoried. EPA provides detailed menus of possible program-building objectives, actions, and activities to consider under each objective.[19] Tribes in the beginning stages of a monitoring program may want to focus on steps in Objective 1, while those with a monitoring program underway may want to focus on the steps in Objective 2. The actions in Objective 3 provide a suite of applications for those tribes that already have substantial monitoring data to use in program management decisions. Tribal WPPs and efforts reveal a common focus on mapping, monitoring and assessment efforts while pursuing a variety of approaches in light of differing circumstances.

The **Fond du Lac Band of Lake Superior Chippewa**, supported by a WPDG, developed a Comprehensive Wetland and Assessment and Monitoring Plan in 2008 and began collecting data in 2010 using a five-year sub-watershed cycle. The tribe seeks to maintain and expand the current plan, facilitating sustainable management and conservation of tribal wetlands. To that end, the tribe identified 12 specific activities to accomplish at various points during the 2019–2023 timeframe.[20]

In 1996, the **Kickapoo Tribe** hired a contractor to complete an inventory of wetlands on tribal land. Of the 123 probable wetlands, approximately 35 were emergent, and only nine were considered to have minimal impacts from human development or use. Another 24 forested wetland areas fared better as only half were impacted by human development. Lastly, two scrub-shrub wetlands were found on the reservation's eastern edge. The tribe now seeks to maintain a comprehensive inventory of wetlands and gain a greater understanding of the functionality and condition of wetland systems within the reservation boundary by monitoring and assessing wetland condition. The tribe has identified five specific actions to undertake in the 2020–2024 timeframe, along with possible partners and potential funding sources to advance these goals.[21]

The **Chippewa Cree** Wetlands Program, in collaboration with its CWA section 106 Water Quality Program, is monitoring headwater wetland conditions and water quality in the Upper Big Sandy Creek watershed. The tribe will use data to assess restoration needs and develop tribal wetland narrative and numeric wetland water quality criteria and standards. Data will also serve to evaluate sites for potential restoration and finalize Tribal Wetlands WQS. Data will also be used to collaborate with EPA and the U.S. Army Corps of Engineers (USACE) to update tribal wetland regulatory mechanisms.[22]

From the **Chicken Ranch Rancheria** WPP: "Monitoring and assessing wetlands is the most important element for Chicken Ranch's wetland program. It is important for the Tribe to build its capacity to understand the location and health of their wetlands. This is especially true because the Tribe is planning on developing a lot in the near future to provide needed infrastructure for the Tribal community. It will be important to monitor how the wetlands are impacted by development."[23]

19 For the monitoring and assessment program objectives, actions, and activities menu, see https://www.epa.gov/sites/default/files/2015-09/documents/monitoring_and_assessment_cef.pdf

20 https://www.epa.gov/sites/production/files/2020-03/documents/fond_du_lac_wpp.pdf

21 https://www.epa.gov/sites/production/files/2020-03/documents/final_ktik_wpp_2_feb_18_2020.pdf

22 https://www.epa.gov/sites/production/files/2018-12/documents/fy20_wpp_amendment_cct.pdf

23 https://www.epa.gov/sites/production/files/2021-03/documents/chicken_ranch_rancheria_wetland_program_plan_signed_2021.pdf

Bizhiki (Bison), one of many shallow open-water wetlands within the Red Lake Indian Reservation. Photo courtesy of Red Lake DNR Water Resources Program.

Mapping, monitoring, and assessment underpin and inform almost every component of tribal wetland programs. While some funders and decision-makers may view ongoing monitoring and other data gathering less favorably than activities that seem more "actionable," monitoring and assessment work is foundational to wetland management and is fundable under EPA Wetland Program Development Grants (WPDGs.) Sound planning may help enforce the importance of mapping, monitoring, and assessment by demonstrating the necessity of gathering objective information to support other program elements and make wise wetland management decisions. However, systematic monitoring is costly and time-consuming. In some cases, monitoring and assessment efforts can be built over time, perhaps starting small to demonstrate the value of the effort. Partnerships with other tribes, state and federal agencies, and academic research programs can also help limit tribal costs and create efficiencies of scale. Tribes may also wish to consider a volunteer monitoring program where there is sufficient capacity and interest.[24]

Participating in cooperative national or regional workgroups or monitoring projects can increase tribal expertise in any or all levels of monitoring, allow for input into regional or national monitoring plans, and ensure understanding of and access to collected data. Tribal planners may want to consider getting involved in regional and national workgroups. Two examples include:

- **The National Aquatic Resource Surveys**.[25] Under this program, EPA and partners can complete a statistically valid sampling of various types of waters (e.g., lakes, rivers, streams, coasts, wetlands) on a national basis, resampling each type every five years. The National Wetland Condition Assessment is specific to wetlands.
- **National Wetland Monitoring Assessment Work Group**.[26] The mission of this work group is to help states and tribes build their capacity to sustain and improve the quantity and quality of the nation's wetlands. The work group aims to develop and implement monitoring and assessment tools and programs that can be integrated into a state or tribe's overall water quality monitoring strategies, as well as to ensure assessment-related science is integrated into state and tribal programs.

One common pitfall for wetland programs is to end up "data rich and analysis poor." Tribes should allocate adequate time and develop or obtain sufficient expertise to conduct the needed analytical tasks, which could be conducted by internal expertise or contract assistance.

Red Lake Band of Chippewa Indians | Wetland Mapping Within the Red Lake Indian Reservation

The Red Lake Indian Reservation is located in north-central Minnesota. Before 2016, the Tribe relied on NWI wetland maps produced by USFWS dating back to the 1980s. Because of this, the Tribe felt that it was in their best interest to update the NWI for the contiguous portion of the reservation to determine if the wetland extent had increased or decreased over time. The Red Lake Water Resources Program put together a WPDG to conduct the task within the WPP. The tribe wanted to update the NWI for the intact portion of the reservation and develop a shoreline ordinance to be followed during construction practices. Once funds became available in 2017, the Water Resources Program collaborated with the Red Lake Forestry Department to obtain land cover layers from timber cruises and logging cuts, and with USFWS to develop a methodology that could highlight hydric soils using the ArcMap GIS tool. *Read the full case study here*.

24 For more information about volunteer monitoring, see http://water.epa.gov/type/wetlands/assessment/volmonitor.cfm.

25 To contact EPA about the National Aquatic Resource Surveys and NWCA, see https://www.epa.gov/national-aquatic-resource-surveys/forms/contact-us-about-national-aquatic-resource-surveys.

26 For more information, see https://www.epa.gov/national-aquatic-resource-surveys/nwca.

C. Regulatory Approaches

Tribal wetland and aquatic resource regulatory programs are defined by the authority under which they operate (e.g., tribal law, CWA §404, and CWA §401). State and tribal regulatory programs regulating aquatic resources typically fall into four main categories:

- Implementation of a CWA §401 certification program that indicates whether the proposed permit or license would be consistent with water quality standards (WQS) and other water quality-related provisions;
- Implementation of a State Programmatic General Permit (SPGP) or a Regional General Permit (RGP). SPGPs and RGPs are general permits issued by the Army Corps of Engineers (USACE) that authorize activities regulated by another entity such as a state or tribe;
- Assumption of the CWA §404 permitting authority, so that the state or tribe issues all CWA §404 permits for the discharge of dredge or fill of material into waters of the United States (WOTUS) within the state's/tribe's jurisdiction; and
- Implementation of a state or tribal permitting program under state or tribal laws and regulations independent of EPA or USACE review.

Tribes vary in whether to include regulatory provisions as a key element of an overall wetland protection strategy. Some tribes view regulating wetland alteration as the cornerstone of a wetland program, supported by other components such as mapping and assessment, voluntary measures, and education. Other tribes have found it more effective to focus on non-regulatory approaches and rely on federal programs as a regulatory backstop. A tribe with extensive lands and numerous activities undertaken by non-tribal parties may elect to enact provisions (e.g., bylaws, resolutions, codes, ordinances, permitting requirements) to regulate adverse impacts on wetlands. Conversely, tribes with smaller populations, less land area, and fewer wetlands may find other approaches to protect and manage aquatic resources that are more efficient and effective. In addition, some tribes not developing their regulatory programs may participate actively in federal programs by commenting on public notices or environmental impact statements. This participation can include offering comments and working with federal, state, and local jurisdictions exercising permitting authority in some cases.

Discharges of dredged or fill material into WOTUS, including jurisdictional wetlands, are regulated under CWA section 404 (33 U.S.C. §1251 et seq.). Many, though not all, tribes coordinate to some degree with the permitting program administered by USACE under section 404. For tribes that have not developed their regulatory program, an initial consideration may be the extent of responsibility the tribe wishes to assume relative to the federal CWA section 404 program. A tribe may wish to consider evaluating its wetlands program to fill "regulatory gaps" or enact provisions to address any issues of specific concern. For example, CWA section 404 jurisdiction is limited to regulating the discharge of dredged or fill material into WOTUS. However, other discharges and activities can impact wetlands and other waters without involving discharges of dredged or fill material. In addition, not all wetland areas fall under federal jurisdiction, even though they may provide important ecological and cultural values.

Tribes developing and implementing regulatory programs will need to evaluate the available level of financial and political support to determine achievable program expectations and where they should focus regulatory efforts. Some questions tribes may want to ask:

- Is expanded protection needed for particular types of wetlands, or to support maintenance of certain ecological services or cultural values?
- Are there gaps in resource protection?
- What wetlands will be protected by the tribal program, in terms of size, type, and/or location?
- How will regulated wetlands be identified?
- Are there opportunities to partner with other parties (e.g., other tribal, federal, state, or local agencies) to create efficiencies, share expertise, and stretch limited staff resources further?

Tribes interested in having a regulatory component as part of a wetland protection strategy and WPP have several options to consider separately or in combination. More advanced regulatory approaches provide more comprehensive regulatory protection, but generally cost more to administer, require greater expertise, and may be more controversial. Each tribe will need to evaluate its unique circumstances—such as prevalence or rarity of aquatic resources, development pressure and other stressors, financial and technical capacity, and cultural factors—when deciding what approach to take. The following pages describe a general continuum of basic to more advanced approaches.

Regulatory Approaches: Some Factors to Consider

- Strength of information base (e.g., GIS mapping capacity, wetland inventory, other land-use data).
- Technical capacity (e.g., wetland delineation training, wetland monitoring and assessment approaches).
- Adequacy of tribal legal authority (e.g., existing tribal ordinances, codes, or laws related to water).
- Effectiveness of existing state and federal regulatory programs to protect wetlands of concern to the tribe.
- Tribal support and acceptance for regulatory approaches.
- Resource commitments and capacity (e.g., dollars, staff time).
- Enforcement components and authorities.
- Relationship to other program elements (e.g., monitoring and assessment; priority sites to protect, acquire, and restore; cultural values and IK/TEK; education and outreach).

Look to Existing State and Federal Regulatory Programs.

In some circumstances, it may not be possible or sensible for a tribe to develop its own regulatory measures. Tribes might be able to achieve effective management and protection of wetlands and other aquatic resources through other, less resource-intensive means if they lack the technical or financial capacity or if a rules-driven approach is not compatible with the tribal culture. In such cases, tribes may elect to engage with existing state and federal regulatory programs by reviewing and commenting on public notices or environmental impact statements, attending public hearings, or seeking to have their interests considered by the regulatory agencies. The effectiveness of this approach depends, in part, upon the strength of the relationship between the tribe and the regulatory agencies and if regulatory agencies are receptive to addressing tribal concerns. Where tribes have treaties with the United States, federal regulatory agencies have a trust responsibility to address tribal concerns. For example, in the Pacific Northwest, treaty tribes significantly influence the outcomes of USACE CWA section 404 permit decision-making.[27]

Enact Specific Tribal Zoning, Ordinance, or Bylaw Provisions.

Zoning or bylaw provisions limiting defined wetland activities may provide them with basic protection. Types of protection may include, among other things, prohibiting certain activities; identifying areas of special environmental concern; requiring setbacks, buffer zones, or seasonal restrictions; and using best management practices. Tribes may include variance provisions to address exceptional circumstances.

Use CWA Section 401 Water Quality Certification Authority If Available.

Authorized tribes[28] and states have an important role pursuant to CWA section 401. Under CWA section 401, a federal agency may not issue a license or permit to conduct any activity that may result in any discharge into WOTUS unless the authorized tribe, state, or interstate agency with jurisdiction over the location where the discharge would originate issues a CWA section 401 water quality certification finding "that any such discharge will comply with the applicable provisions of sections 301, 302, 303, 306, and 307" of the CWA, or unless such certification is waived, per 33 U.S.C. 1341(a)(1). If an authorized tribe, state, or interstate agency issues a CWA section 401 certification, CWA section 401(d) provides that the certification shall establish conditions, including "any effluent limitations and other limitations, and monitoring requirements" that are necessary to ensure the applicant for a federal license or permit will comply with applicable provisions of CWA sections 301, 302, 306, and 307, and with any other appropriate requirement of tribal or state law set forth in the certification. See *Id.* at 1341(d). Authorized tribes may grant (with or without conditions), deny, or waive water quality certification with respect to federal licenses or permits, including federally issued CWA section 402 and section 404 permits. Unless a water quality certification is granted (with or without conditions) or waived, the federal agency cannot issue the license or permit. See *Id.* at 1341(a)(1). The federal agency must include in the license or permit any conditions that the

27 https://www.nws.usace.army.mil/Media/News-Releases/Article/754951/army-corps-halts-gateway-pacific-terminal-permitting-process.

28 As provided for in 40 CFR 131.4(c), tribes that have been deemed eligible for EPA treatment in a similar manner as a state under CWA Section 303(c) can conduct section 401 certifications.

authorized tribe, state, or interstate agency provides with its certification. See Id. at 1341(d). In cases where no tribe, state, or interstate agency has authority to issue a water quality certification, EPA is responsible for issuing certification, per 33 U.S.C. 1341(a) (1). For more information on CWA section 401 water quality certification, please visit https://www.epa.gov/cwa-401.

Develop and Promulgate Tribal Regulations.

A wide range of regulations governing the alteration of wetlands may be promulgated by a tribe, relying on its land use management authority and inherent interest in protecting aquatic resources. Tribal regulations may parallel provisions of CWA section 404 in protecting wetlands from avoidable or significant adverse alteration or destruction Regulations may also differ in any number of ways from federal CWA requirements, depending on a tribe's priorities. Tribes that have established their regulatory program may have opportunities to reduce duplication between tribal departments and federal agencies. For example, a tribe might be able to develop joint application and/or joint public notice processes with federal permitting agencies or integrate tribal and federal permitting actions by developing a regional or programmatic general permit (PGP) with USACE (see Issue a Tribal PGP below). Tribal regulatory programs will typically also contain an enforcement component to address both unauthorized activities and activities that do not comply with the terms and conditions of an issued tribal permit. Note that the cost of enforcement may often be higher per case than the cost to review and issue a permit.

In some cases, tribes can synergistically combine regulatory program requirements with other objectives. The Confederated Salish and Kootenai Tribes (CSKT), for example, has been able to integrate regulatory provisions, restoration goals, and effective partnerships in a mutually beneficial and reinforcing way (see box).

Confederated Salish and Kootenai Tribes Wetlands Restoration and Compensatory Mitigation Efforts

CSKT has a stringent Wetlands Conservation Plan that it implemented to reach the goal of "no net loss" of wetland acreage across the reservation beginning in the late 1990s. The plan provides for mapping, monitoring, and assessment, of the reservation's wetland resources. Most notably though, the plan (along with various tribal ordinances) is a regulatory tool that holds developers accountable for unavoidable impacts to wetlands, requiring 3-to-1 compensatory mitigation. The Finley Flats Wetland Preserve is an example where CSKT and the Montana Department of Transportation (MDT) worked together to restore wetlands. CSKT leveraged resources from settlement monies along with funding from MDT and other sources to restore some 200 acres of wetlands, some of which were used as credits to mitigate for impacts of the Highway 93 redesign project that began in the early 2000s and is still occurring today. *Read the full case study here*.

Regulatory staff collectively need to have or be able to access multiple kinds of expertise. They must be able to delineate wetlands, apply monitoring and assessment tools, and exercise sound judgment when evaluating proposed project impacts based on their knowledge of aquatic ecosystems. In addition, staff need to have in-depth knowledge of multiple laws and regulations, as well as how to handle enforcement

Close-up of emergent and aquatic bed of a Pacific Northwest peat system. Dominating the aquatic bed are red toad rush (Juncus sp.) and pond-lily (*Nymphea* sp.) in the foreground and Dulichium (*Dulichium arundinaceum*) in the background. Photo courtesy of Linda Storm.

cases. Regulatory personnel often use technical mapping equipment, including GPS and GIS data collection, to maintain regulatory databases.

It is also important to communicate effectively with tribal and non-tribal community members who may be unfamiliar with permit requirements. The success of a regulatory program often depends on both the coherence and clarity of its structure and the skills and training of the staff. Where regulatory responsibilities are shared across tribal agencies, joint training may be advisable. Some tribes have also linked their regulatory activities to education and public outreach efforts. For example, the Northern Cheyenne Tribe identified multiple tasks in its WPP to educate the community about its wetland program and regulatory protection efforts, including to:

> ***"Perform public education and outreach about wetland protection, regulated waters and activities, and authorization process. The Wetlands Program has a good relationship with the local schools as well as Tribal departments. Numerous presentations were held over the course of the past few years to a variety of audiences from high school students to livestock operators. Presentations are created and presented at agricultural workshops, school career fairs, cultural resource trainings, and informational sessions held with Tribal government officials. [We] educate the public on Tribal and federal regulations to help the public understand the importance of the regulations Activities to this end include hosting seminars, conducting presentations at local schools, establishing informational booths at local events such as pow-wows and career fairs, and writing periodic articles for publication in local newspapers. Materials obtained from EPA Region 8 are distributed at events listed above and are made available on the Northern Cheyenne Tribal website. The Wetlands Program intends to make all presentations and brochures available for online access going into the future. The Wetlands program also creates and updates written material for the public. There are two brochures [about Tribal] wetlands and wetlands program activities. The Wetlands Program also utilizes existing information sheets by EPA to educate the public on the regulatory processes surrounding wetlands. These materials are made available at our office and are used in all presentations."***

Issue a Tribal Programmatic General Permit (PGP). Under certain circumstances, USACE may be able to issue a PGP, which relies on the tribe to review certain proposed activities regulated under CWA section 404. Where tribal authority is at least equivalent to federal authority for specified actions, USACE may issue a PGP, under which approving and issuing the permit depends primarily on review by the tribal program. Larger projects or those where issuing a permit would cause more than minimal impacts still typically require both tribal and federal review. The overarching general permit agreement is renegotiated and reissued every five years. As tribes gain regulatory experience, USACE may add more categories of activities to the PGP, thereby relying to a greater extent on the tribal regulatory program. Developing and subsequently expanding a PGP may be considered an action step in the regulatory activities core element of a WPP.

Request Tribal Assumption of the CWA Section 404 Program. Tribes with "treatment in a similar manner as a state" (TAS) status may request to assume the CWA section 404 program. "Assumption" of the CWA section 404 program describes the process whereby a tribe obtains approval from EPA to administer the CWA section 404 program within its borders and consequently begins administering all aspects of the program. In such instances, USACE would no longer administer the Section 404 program, except in certain waters. For tribes with mature, integrated water management programs that include the regulation of dredged or fill material discharges into WOTUS, CWA section 404 assumption provides an option to carry out a fully integrated and comprehensive program addressing the full range of tribal and CWA section 404 authorities. Assumption is not delegation; a delegated program means that a tribe is issuing a permit or taking an action on behalf of the federal government. In accordance with the requirements of CWA section 404(g), a state or tribe may only be authorized to assume the section 404 program if it has authority over all "assumable waters"[29] and demonstrates it will apply standards consistent with and no less stringent than the CWA requirements in operating a permitting program. A tribal dredged-and-fill permitting program can be more protective than the CWA requirements.

To date, only three states (Michigan, New Jersey, and Florida) and no tribes have assumed the section 404 program. There are several explanations for these low numbers, including that not all waters are "assumable," as well as a complicated

29 "Assumable" waters are essentially those not considered traditionally navigable in fact and specifically identified on a state-by-state basis.

application and approval process, difficulties in aligning with federal jurisdictional and other regulatory requirements, and the added costs incurred. However, EPA has been examining approaches to reduce impediments to assumption. Interest is increasing among states and tribes that wish to further reduce duplication and to further rely on their own water programs and environmental criteria.

Tribes may consider any of the above steps and strategies related to regulation or developing regulatory programs in a tribal WPP. Different levels of regulation vary greatly in cost. Developing a CWA section 401 program and requiring conditions on federal permits and licenses may be less costly, for example, than administering a full permit program. In any case, adding to, revising, or expanding a regulatory program often requires multiple actions, including:

- Assessing tribal needs and priorities.
- Drafting potential regulatory language and guidance.
- Obtaining input from tribal members, tribal leadership, regulated communities, and other affected parties as rules and provisions are crafted.
- Obtaining approval from tribal council and leadership once rules and provisions are drafted.
- Creating administrative materials such as permit forms.
- Developing decision-making tools such as assessment methods and permit criteria for program implementation.
- Developing tracking systems.
- Funding, hiring, and training staff.
- Administering the program once it is developed.

Many of these actions apply to more than one step and help build tribal long-term capacity to the desired level. Even tribes with active regulatory programs may continually work toward refining program effectiveness and efficiency. Tribes may include any of the listed actions, as well as incremental changes and improvements, in their WPPs.

Tribes have used regulatory tools in a variety of ways:

In its WPP, the **St. Regis Mohawk Tribe** identified a key goal of reducing the amount of wetland drainage and destruction to create suitable areas for agricultural, residential, and commercial development. In order to move in that direction, the tribe's objectives included clearly defining the jurisdictional scope of its regulatory program and delineating wetlands in a manner that is at least equivalent to federal jurisdiction. Moreover, the tribe proposed clear guidance on how to identify jurisdictional waters and activities as well as develop a clear and effective set of criteria for reviewing and responding to permit applications. The criteria would include consideration of cultural impacts and adopt the CWA section 404(b)(1) guidelines, or more stringent review criteria, for assessing, avoiding, and minimizing, and mitigating for impacts. The tribe also proposed establishing minimum requirements and review criteria for financial assurance proposals for mitigation projects.

In 2006, the **Fond du Lac Band of Lake Superior Chippewa** developed and enacted a Wetland Protection and Management Ordinance, modeled after, but not assuming, the CWA section 404 program. They now regulate activities in wetlands—including wetland dredge, fill, and drainage—and have adopted a Water Quality Certification Standards Ordinance, which governs the processing of section 401 certifications using their EPA-approved WQS.

During 2011–2012, the **Blackfeet** Environmental Office revised the Blackfeet Aquatic Lands Protection Ordinance. This ordinance is the Tribe's wetlands protection regulation and requires a permit for all activities affecting water bodies or wetlands within the reservation boundary. The wetlands program also performs homesite lease reviews for tribal members to identify potential impacts to wetlands and floodplains, as well as pre-construction site reviews for any projects that may impact wetlands. The tribe has also identified a critical need to monitor and protect groundwater, surface water, and wetland quality, based on pressures from oil and gas exploration, housing developments, and agricultural activities. The tribe states that the amended ordinance, along with the section 401 certification process, will ensure the protection of existing wetland and riparian resources and preserve and protect water quality.

D. Water Quality Standards for Wetlands, and CWA Section 401 Authority

WQS are a cornerstone of the CWA. Under the CWA, states and authorized tribes[30] designate the "highest attainable uses" for waterbodies, set criteria to protect those uses, and establish provisions to protect waters from degradation. State and tribal WQS approved by EPA can be established for any WOTUS, including jurisdictional wetlands. EPA's WQS regulations (40 CFR parts 131 and 132) provide specific requirements for states and authorized tribes to develop standards that designate uses, establish protective criteria, and establish anti-degradation provisions for all WOTUS, including wetlands.[31] States and authorized tribes have flexibility to adopt sub-categories of uses and associated criteria to allow for differentiation between types of wetlands and their expected uses, functions, and conditions.

Within the context of the overall WQS program, tribes can develop specific standards for wetlands, including criteria that define the physical, chemical, and biological conditions desired in tribal waters. As with water quality criteria for other surface waters, criteria for wetlands can be narrative or numeric. While developing narrative standards may be relatively easy, developing specific numeric criteria for wetlands has, for several reasons, been more challenging than developing criteria for other types of waters. For example, the sheer number of wetlands in a jurisdiction compared to streams and lakes makes developing numeric standards for wetlands challenging. Criteria for a healthy wetland might be quite different than that for a healthy stream or lake, particularly for parameters such as dissolved oxygen, hydrology, vegetation types, flow regimes, conductivity, alkalinity, soils, and pH. Tribal wetland WQS may also use parts of tribal laws and regulations that do not apply to instream water[32] of tribal efforts to protect waters with WQS is available at https://www.youtube.com/watch?v=EY6r810Kwac.

Currently, most tribes do not have EPA-approved WQS in effect for CWA purposes, and even fewer have WQS for wetlands. As of early 2022, approximately 79 tribes have TAS status under CWA section 303(c); EPA has approved WQS for 46 of those tribes.[33] Where EPA determines that a tribe is eligible to the same extent as a state for purposes of WQS, the tribe is eligible to the same extent as a state for purposes of certifications conducted under CWA section 401, per 40 CFR 131.4(c). EPA has also developed certain tools to assist tribes interested in developing approvable WQS, including:

- The **TAS application template**, which tribes can download and customize to address all eligibility requirements listed in EPA's implementing regulations at 40 CFR 131.8. The template's aims to simplify tribal applications for tribes with TAS status to administer CWA section 303(c) WQS and section 401 water quality certification programs.
- The **Model WQS template**, another document tribes can download and customize to provide model WQS text that, together with tribal input and guidance from the appropriate EPA region, will simplify the process of developing tribal WQS consistent with the implementing regulations. The template includes language covering designated uses, water quality criteria, antidegradation, several general provisions, and language for WQS for wetlands. The template provides opportunities for tribes to tailor their WQS to reflect tribe-specific circumstances, including a provision to protect cultural and traditional uses.
- **Templates for developing wetlands WQS**, which address the three components of WQS—designated uses, criteria, and antidegradation—and also provide wetland-specific terms and language so states and tribes can tailor standards to suit the needs of the wetland, as well as simplify WQS development.

Tribes can use WQS to determine whether tribal waters are meeting expectations and identify whether certain waters need protection from degradation. Moreover, under CWA section 401, tribes with TAS status for section 401 are authorized to certify whether federal licenses and permits that authorize discharges (including, for example, discharges of effluent under section 402 or discharges of dredged and fill material under section 404) comply with the applicable

30 "Authorized tribes" in this Section D refers to those federally recognized Indian tribes with authority to administer a CWA section 303(c) WQS program. Under EPA's regulations at 40 CFR 131.4(c), a tribe that is eligible to administer WQS is likewise eligible to administer CWA section 401 water quality certifications.

31 For a more comprehensive treatment of WQS, see https://www.epa.gov/wqs-tech/water-quality-standards-handbook. A video with stories of tribal efforts to protect waters with WQS is available at https://www.youtube.com/watch?v=EY6r810Kwac.

32 See, e.g., the Fond du Lac Tribe in Minnesota (https://www.fdlrez.com/RM/wetlandordinance.htm) and the Northern Cheyenne Tribe in Montana (https://www.epa.gov/sites/default/files/2014-12/documents/cheyennewqs.pdf).

33 https://www.epa.gov/wqs-tech/epa-actions-tribal-water-quality-standards-and-contacts

Perched dragonfly drying itself. Photo courtesy of Red Lake DNR Water Resources Program.

provisions of sections 301, 302, 303, 306, and 307, and any other appropriate requirement of tribal law. Pursuant to their CWA section 401 authority, tribes can object to or impose conditions on federal licenses and permits to prevent the degradation of their waters, including wetlands.

Many tribes have not developed wetland specific WQS due to a lack of technical information or monitoring data to develop criteria for many WQS parameters. Moreover, the water column WQS typically used for lakes and streams do not translate well to wetland environments (e.g., a dissolved oxygen criterion set for a free-flowing stream would be inappropriately high in a wetland). Due to the unique characteristics of wetlands relative to flowing surface waters, WQS for wetlands may differ substantially from traditional surface water WQS, with less focus on water chemistry parameters and more emphasis on biological and physical indices.

Tribes have addressed these issues in different ways. Some tribes have adjusted overall standards so that they clearly apply to wetland as well as other waters. Other tribes have developed wetland-specific WQS that consider the special needs of wetlands. Tribes contemplating developing wetland WQS should follow the fundamental requirements for WQS, as defined by EPA. Some tribal WPPs mention these issues forthrightly. For example, the Yakama Nation WPP indicates that some of the tribe's draft WQS "do not reflect the natural range of reference conditions on the Reservation well, and at present they do not include biological response indicators (such as benthic macroinvertebrate community indices)." Under EPA WPDG funding, the Yakama Nation worked with a consultant to analyze macroinvertebrate samples to begin developing a biological integrity model.[34]

EPA has identified five essential steps for developing WQS for wetlands:[35]

1. Define wetlands as "tribal waters."
2. Identify designated uses that protect the structure and function of wetlands.
3. Adopt narrative criteria and appropriate numeric criteria in the WQS to protect designated uses.
4. Adopt narrative biological criteria in the WQS.
5. Include an antidegradation policy.

An important first step is to ensure that wetlands are defined as "waters" within the tribal water quality program and adopt a definition of wetlands within the standards and associated policy or regulations. The legal definition of waters, including wetlands, should be at least as inclusive as the CWA definition. Developing wetland-specific WQS will typically involve identifying wetland types or classes with a description of the desired condition or function for each wetland type or class. Defining baseline conditions and functions requires gathering monitoring data and analyzing the data along with existing data, as well as obtaining baseline data on reference wetlands. Standards should establish or identify "designated uses" (e.g., fish habitat, recreation, cultural uses) for wetlands, which may vary according to wetland type or class. Some tribes have also applied relevant designated uses for other waters to wetlands.

Fond du Lac Band of Lake Superior Chippewa | Development of Wetland Water Quality Standards

In preparation for Fond du Lac's triennial review of its WQS, the tribe's wetland program developed a narrative wetland WQS. The tribe primarily used an EPA template tool for developing narrative standards specific to wetlands. This tool aided in preparing language to describe wetland functions as wetland-designated uses. The tribe's designated uses for wetlands include baseflow discharge and groundwater recharge, flood flow attenuation, recreation, plant and animal diversity and abundance, and cultural opportunities, among others. The narrative criteria essentially require that the wetlands "maintain biological, physical, chemical and hydrological conditions as compared to reference wetlands." The standards also contained a tiered anti-degradation policy. *Read the full case study here*.

34 https://www.epa.gov/wetlands/state-and-tribal-wetland-program-plans#r1.

35 For more detailed information, see https://www.epa.gov/wetlands/wetland-water-quality-standards and https://www.epa.gov/wqs-tech/templates-developing-wetland-water-quality-standards.

Criteria are then established to describe the condition or functions necessary to achieve or meet each designated use. Narrative standards may describe the structure and species composition of a wetland type and are often constructed in a "free from" format (e.g., "free from oils and grease, free from fill material"). Narrative standards should be well-documented, including procedures for determining compliance. Numerical standards define quantitative criteria for specific chemical, physical, and biological parameters.

Such numerical standards may be complex for wetlands, given the wide range in "normal" conditions across the diversity of wetland types, as well as seasonal fluctuations. In addition, unlike many other surface waters, wetlands often exhibit low dissolved oxygen. Normal pH also varies significantly between, for example, peat bogs and calcareous fens. Consequently, many wetland WQS rely primarily on narrative criteria, although some tribes have established numerical standards. Wetland WQS generally require a suite of measures to protect the full range of wetland types, functions, ecological conditions, and designated uses.

One of many freshwater fens within the Red Lake Indian Reservation. These fens provide many plant species of cultural significance. Photo courtesy of Red Lake DNR Water Resources Program.

Confederated Tribes of the Colville Reservation

The Confederated Tribes of the Colville Reservation's draft update of the WQS includes updated standards for wetlands. Beneficial uses associated with wetlands include aquatic life, ceremonial and religious uses, primary contact recreation, wildlife habitat, and stock watering. The draft water quality criteria for wetlands are primarily narrative. For example, they state that measurable changes from natural background conditions are not allowed for temperature, pH, bacteria, and total dissolved gas. In contrast, limited increases in turbidity from background are allowed. In addition, the draft update includes narrative criteria for aesthetic quality, nutrient levels, radioactive substances, aquatic biota, wildlife, instream flow, and maintenance of wetland hydrology, substrate, and hydrophytic vegetation. Criteria for toxic substances and anti-degradation policy would also apply to wetlands.

In addition to identifying uses and criteria, a third WQS component is enacting an antidegradation policy that protects designated uses and prohibits lowering the quality of Tier 3 wetlands considered "outstanding natural resource waters." Once approved, tribes could apply wetland WQS when making CWA section 401 water quality certification decisions, including setting limits or conditions on discharges issued under the National Pollutant Discharge Elimination System permits (CWA section 402) and restricting the discharge of dredged and fill material and associated impacts under CWA section 404 permits. Tribes can also apply wetland WQS to other potential federal licenses or permits (e.g., Federal Energy Regulatory Commission licenses).

Developing defensible WQS for wetlands is a data-driven effort and depends on a robust wetland monitoring and assessment program. Tribes can derive and support standards using wetland function assessment or condition measurements. Data collected through monitoring are summarized in a national report through EPA's integrated reporting system. This biennial report provides a national assessment of water quality (the 305(b) report) and a list of waters that do not meet the standards (the 303(d) list).

For example, in its WPP, the **Red Lake Band of Chippewa Indians** describes how extensive monitoring and research has been performed over the past decade on certain reservation wetlands. Further, the tribe will use the data collected to determine baseline conditions and appropriate wetland WQS. The tribe will continue monitoring on a five-to-ten-year rotation and plans to expand its monitoring efforts to all feasible wetland types to develop appropriate WQS for wetlands. This expansion requires a collaborative effort with other tribal and state agencies to develop a monitoring strategy for all feasible wetlands. Developing wetland specific WQS for biological and chemical criteria will provide the tribe with a foundation for establishing reference wetland conditions. Wetland WQS that ensure wetlands are treated as waters within the tribal water quality program will be submitted to the tribal council and EPA for approval. The draft will contain biological and chemical criteria that must be maintained when monitoring wetlands.

Similarly, the Yurok Tribe's WPP describes its approach:[36]

> **[The Yurok Tribe]** *will continue the ongoing wetlands water quality study. Establishing water quality standards requires a thorough understanding and confidence of the conditions existing in wetlands and requires a comprehensive multi-year monitoring effort. Existing baseline data will be used to further characterize and assess wetland conditions and function. Information gained through these efforts will be used to facilitate refinement of data collection methods, site location planning, and data management and reporting. Information gained through these efforts will be used to develop Tribal Water Quality Standards for wetlands complexes within the Yurok Reservation. [The Tribe] will continue working towards development of regulations and water quality standards specific to wetlands within a Tribal Wetlands Protection Ordinance and plan. Pursuit of TAS for CWA authority from USEPA will enhance the Tribe's regulatory authority to protect waters within the Yurok Reservation.*

To summarize, while developing WQS for wetlands can require a significant up-front investment of tribal time and effort, the longer-term dividends include providing a more rigorous foundation for protecting and enhancing tribal wetland resources, as well as providing the scientific basis for a variety of actions. Some of these actions include:

- **Permitting:** WQS provide a clear basis for making water quality–based permitting decisions under CWA sections 402 and 404 and other tribal programs, as well as informing decisions in other areas that affect wetlands, such as nonpoint source (NPS) pollution control programs.
- **Water quality certification:** WQS provide a stronger basis for authorized tribes to approve, condition, or deny certifications under CWA section 401 programs (see description in Section III.C above).
- **Monitoring, assessment, and reporting:** Wetland WQS provide a benchmark against which monitoring data can be used to assess and report on wetland function or condition.
- **Restoration and protection:** Tribes can use wetland WQS to guide restoration and protection efforts and gauge their effectiveness.

E. Voluntary Restoration and Protection

Some tribes include voluntary restoration and protection activities as a key component of their wetland programs. Voluntary projects achieve important protections while providing opportunities to build partnerships; share data; and pool resources with agencies, communities, nonprofit groups, and private landowners. Voluntary projects may also offer a means to educate tribal and non-tribal community members about the value of aquatic resources. Voluntary efforts to restore and protect wetlands normally receive wide and enthusiastic support. Tribes have an opportunity to facilitate the restoration, enhancement, or protection of wetlands to sustain or repair ecological functions and cultural values either by acting directly or working collaboratively with other parties. Project goals associated with voluntary restoration may include habitat management, water management, preservation of cultural values, flood attenuation, recreation, or other objectives. Wetland restoration and protection maintain critical wildlife habitat, help meet tribal watershed management goals, and contribute to economic well-being. In many cases, voluntary efforts may align with other aspects of a WPP, such as regulatory activities, water quality improvement efforts, and the protection of cultural values and uses.

36 https://www.epa.gov/wetlands/state-and-tribal-wetland-program-plans#r1

Umatilla River Vision: First Foods to Sustain Culture

In 2007, the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) created a "Vision for the Umatilla River" that imagines the Umatilla basin with a "healthy river capable of providing First Foods that sustain the continuity of the Tribe's culture." The Tribal goal: "Protect, restore, and enhance the First Foods (water, salmon, deer, cous, and huckleberry) for the perpetual cultural, economic, and sovereign benefit of the CTUIR, to be accomplished by utilizing traditional ecological and cultural knowledge and science to inform: population and habitat management goals and actions; and natural resource policies and regulatory mechanisms." See also:

- Jones, K.L., et al. 2008. *The Umatilla River Vision*. Confederated Tribes of the Umatilla Indian Reservation Department of Natural Resources.
- Quaempts, E.J., et al. 2018. *Aligning Environmental Management with Ecosystem Resilience: A First Foods Example from the Confederated Tribes of the Umatilla Indian Reservation, Oregon, USA*. *Ecology and Society* 23(2): 29.

Columbian black-tailed deer buck (*Odocoileus hemionus columbianus*) at the edge of forested wetland composed of willows (Salix hookeriana) and pine (*Pinus contorta*), with salal and ferns in foreground. Deer browse and forage on many wetland shrub and tree species, whereas elk tend to browse on emergent and herbaceous plants. All species of these ungulates are culturally important to many tribes throughout the Americas for food and materials. Photo courtesy of Linda Storm.

Voluntary activities to protect wetlands may employ several interrelated terms, including "restoration" (also referred to as "rehabilitation" or "re-establishment"), "enhancement," "establishment" (sometimes referred to as "creation"), and "preservation," which may have slightly different definitions depending on context. "Wetland restoration" typically refers to returning wetlands to a more highly functioning state by manipulating their physical, hydrological, chemical, or biological characteristics.

Restoration is the process of assisting in the recovery of an ecosystem that has been degraded, damaged, or destroyed. Wetland and aquatic habitat restoration projects typically target degraded but not altogether lost ecosystems that retain the potential to reacquire a higher level of ecological function. Typically, restoration involves returning hydrology to areas that were once wetlands and are no longer, or that have been severely degraded or damaged. Restoration can also include restoring other ecological processes (e.g., reintroducing beaver to restore hydrologic connectivity between streams, floodplains, and floodplain wetlands). Wetland establishment involves changing the geography (i.e., hydrological, physical, and biological characteristics) of a site to develop a wetland where one did not previously exist. Wetland enhancement means altering the physical, chemical, hydrological, or biological characteristics of an existing wetland site to increase its functional capacity for one or more functions, such as water quality improvement or flood water retention, or to improve habitat for certain species of wildlife. Wetland enhancement changes a wetland's functional profile and normally increases capacity for some functions while diminishing capacity for others. For example, managing for woodcock may diminish habitat quality for forest interior songbirds, while improving water quality functions can degrade habitat functions.

Stockbridge-Munsee Community | Emerald Ash Borer/Black Ash Project

Black ash wetlands are common on the Stockbridge-Munsee Community Reservation and are an important ecological and cultural species. These wetlands face a major threat from emerald ash borer (EAB), an invasive beetle that kills native ash trees. EAB invasion is expected to cause water level rise and major vegetation community shifts in black ash wetlands. The tribe received an EPA WPDG to develop a monitoring protocol for black ash wetlands to document pre- and post-EAB conditions and to serve as controls to guide and assess the effectiveness of mitigation and restoration efforts. The tribe was awarded a subsequent WPDG to expand the research and include sap flow monitoring to assess the functional role of black ash and associated tree species on the water budget of these systems. Researchers from the U.S. Forest Service and University of Wisconsin–Madison have partnered in this monitoring and research. The tribe is underplanting black ash stands with suitable replacement species to mitigate for EAB impacts, allowing seedlings to become established before EAB invades. The tribe has used funding from the Natural Resources Conservation Service's Environmental Quality Incentives Program to offset the planting costs. *Read the full case study here*.

Some tribes directly undertake restoration and protection projects. They may restore or enhance wetlands to meet habitat goals, support floodplain restoration projects through stormwater or floodplain management programs, protect water quality by establishing filter strips or similar projects through CWA section 319 NPS programs and grants, or sustain or restore cultural values such as managing wetlands for culturally important food, fiber, or medicine plants. Restoration typically involves removing structures like dikes, dams, or berms (e.g., removing dikes to restore and reconnect river hydrology to floodplain or wetland areas that had been disconnected), or removing exotic or invasive plant species. Enhancement activities may also involve removing structures, although in some cases they can include repairing or replacing dikes or berms, water control structures, or habitat features to modify the hydrological function (e.g., raising or lowering water levels to achieve management goals), as well as replanting native vegetation. Tribes may combine any voluntary activities that increase functions and values of wetlands with actions to protect wetlands by removing or diminishing threats, which tribes can then secure through legally binding agreements such as fee simple acquisition, conservation easements, or deed restrictions.

An accurate and up-to-date inventory of wetlands underpins an effective restoration program and drives adaptive management strategies. If comprehensive data are not available, a tribe can consult existing maps and information and expand data from there. In any case, tribes can pursue any or all of the following objectives as they develop voluntary restoration and protection efforts:

- Clearly and consistently define restoration and protection goals throughout tribal territory.
- Protect wetlands from degradation or destruction.
- Restore wetland acres, condition, and function.
- Track progress over time, document results, and modify practices as appropriate.

In some cases, the wetland inventory can include an assessment of "restorability." For example, the Stockbridge-Munsee Community (SMC), funded by an EPA WPDG, mapped potentially restorable wetlands (PRWs) throughout selected watersheds that overlapped with the reservation. SMC contracted St. Mary's University of Minnesota, GeoSpatial Services, to conduct the GIS-based analysis. First, the location and type of "historic wetland" were delineated using photointerpretation of 1938 aerial imagery. Data were also collected on current wetlands. Historic and current wetland boundaries and vegetation types were visually compared, and the cause of any observed change was documented (e.g., anthropogenic change, beaver influence).

Another method SMC used to identify PRWs relied on an overlay analysis of several geospatial datasets, including wetland polygons, soils, and elevation-derived hydrological measures. Road and land use layers were then used to identify permanently altered wetlands where restoration was infeasible. When combined, these methods allowed the tribe to identify 178 PRWs throughout the watershed. The tribe has used this dataset to guide wetland restoration planning, complete further site evaluations, and assess restoration potential on newly acquired lands.

Where tribes include restoration and non-regulatory protection efforts in their WPPs, these efforts should be informed by identified needs for habitat improvement, water quantity and quality management, recreational uses, and/or protection and restoration of cultural values. In some cases, it may be useful to inventory relevant federal, state, or private wetland restoration or protection programs and explore whether they might support or complement tribal efforts.

In addition, multiple parties may contribute to identifying restoration and protection goals for specific watersheds or priority areas. For instance, protecting habitat for endangered species may differ significantly from identifying a wetland to use as part of a stormwater management system, which risks degrading habitat functions without pre-treatment. In other cases, multiple goals may align, such as when restoration to provide flood storage in riparian areas also enhances needed hydrological function in wildlife corridors.

Some tribes facilitate developing voluntary wetland restoration and protection programs by forming partnerships of various kinds, allowing different groups to share technical information, support projects of mutual interest, and cooperatively promote public funding and support for voluntary wetland restoration. Tribes can participate in both intratribal and intertribal partnerships, as well as coordinated efforts with local, state, and federal agencies and departments (e.g., fish and wildlife, transportation, agriculture, forestry), and nongovernmental organizations. Nongovernmental organizations can include conservation groups such as The Nature Conservancy, Ducks Unlimited, Trout Unlimited, and land conservancies.

Prairie Band Potawatomi Nation | Wetland Reserve Easement Project

In 2018, the Prairie Band Potawatomi Nation and the Natural Resources Conservation Service commemorated the approval of a 30-year Agricultural Conservation Easement Program that provides for a wetland reserve easement contract to restore the functions and values of an existing 31.7-acre wetland located within the reservation. This event marked the first tribal wetland long-term contract established in Kansas and one of only a handful throughout the United States. It brings to reality a project first envisioned by the Nation in 1996. The project will restore and enhance wetland wildlife habitat and improve overall water quality for the contract area, and provide opportunities for educational outreach, hunting, trapping, and recreational bird watching. A walking path will be established for visitors to reach the center area of the wetlands to observe the natural wildlife in their restored habitat. *Read the full case study here*.

Confederated Salish and Kootenai Tribes | CSKT Voluntary Wetlands Restoration Efforts

As the largest landowner on the Flathead Indian Reservation, CSKT can affect conservation through voluntary restoration and protection efforts as well as through compensatory mitigation. The tribes have persisted through a few key legal battles and won settlements for damages to natural resources in ceded lands. As a trustee, the tribes were obligated to spend the settlements on restoring aquatic resources within the reservation. The tribal fisheries and wildlife programs have spent two decades purchasing and restoring aquatic habitats on the reservation to benefit fish, wildlife, and other tribal values. *Read the full case study here*.

In some cases, nongovernmental organizations, local agencies, and private landowners may be interested in wetland protection or restoration but lack the guidance to proceed. Tribes may be able to help these groups obtain information on technical issues or additional resources. Many state and federal programs provide information and, in some cases, funds for wetland restoration and protection efforts that can show clear benefits.[37]

While voluntary restoration and preservation of wetlands generally receive broad support, some difficulties of these efforts may include:

- **Conflicting goals:** Certain enhancement projects may favor one type of wetland function over others. For example, impoundment of a stream may benefit waterfowl but be detrimental to fish and some native plant habitats. Tribes must evaluate any planned use or expansion of wetlands to provide stormwater management, including water quality treatment and flood water attenuation, for the potential to cause deleterious effects to wetland condition and water quality, which in turn would conflict with habitat protection and restoration goals.
- **Technical challenges:** Some types of wetlands can be difficult to re-establish or impossible to restore once altered. These can include forested wetlands, peatlands (including bogs and fens), and other ecotypes that are

37 The Wisconsin Department of Natural Resources has, for example, developed helpful materials regarding wetland restoration. See https://dnr.wisconsin.gov/topic/Wetlands/restoration.html

Great blue heron, called a crane by most Pacific Northwest tribes, in Puget Sound waters (part of the broader Salish Sea), with kelp in the background. Photo courtesy of Linda Storm.

highly sensitive to hydrological alterations. Even in wetland types where successful wetland restoration is well documented, scarcities of suitable water, soils, or plant stock reduce the prospects for success.

- **Regulatory requirements:** Permits are frequently required for wetland restoration work because restoration often involves conducting some form of activity within areas under tribal, state, and/or federal jurisdiction (e.g., placing fill in wetlands, installing temporary coffer dams to dewater areas, constructing berms or installing structures, restoring straightened streams to new or historical channels).
- **Cost:** Lack of funds to undertake desired wetland restoration and preservation projects can be a significant limiting factor. Collaboration among multiple interest groups is one common way to address this need, seeking to share costs, expertise, and staff time. In addition, demonstrating program success through monitoring and reporting on completed projects can improve prospects for securing future funding support. While tribes can use WPDGs to identify priority wetland sites to restore and develop restoration plans, support for project implementation requires other funding sources (see Section IV below).

As a related and typically less voluntary activity, wetlands are often restored to provide compensatory mitigation as a condition of a permit, authorizing unavoidable adverse impacts to aquatic habitats. Technical and policy issues associated with compensatory mitigation generally relate to the Regulatory Activity core element. In some cases, voluntary restoration and regulatory program requirements may function synergistically to achieve overall restoration planning objectives as, for example, when different tribal departments share maps of vulnerable or rare wetland resources that should be prioritized for restoration or heightened protection. Moreover, regulatory and voluntary wetland restoration may play a role in the broader tribal implementation of CWA programs. For example, CWA section 319 grants provide funds and technical assistance to states and tribes to develop and implement plans to reduce NPS pollution. Many of these projects also fund stream or aquatic ecosystem restoration. Similarly, tribes may pursue wetland restoration to improve impairments to lake or stream water quality and to comply with total maximum daily load pollutant allocations in impaired waters and watersheds. Tribes can improve water quality through total maximum daily loads that relate to nutrient loading, temperature, or other pollutants that can be addressed in part by restoring or protecting wetlands in the watershed.

Stockbridge-Munsee Community | Resolving a Restoration Conflict

The Stockbridge-Munsee Community received grant funding to remove multiple sections of an abandoned railroad bed that the tribe had recently acquired The presence of the rail bed embankment and perched culverts had severely altered the hydrologic connectivity of adjacent wetlands and a small trout stream for over 100 years. Although approved by tribal leadership, the project met resistance from some members of the tribal community, who started a petition to halt construction. The location and length of the rail bed made it a popular road for tribal members to use for hunting access, ATV use, snowmobiling, and general travel. In the end, a compromise was reached that changed the project design considerably. Instead of removing the rail bed, the tribe installed five large culverts to restore hydrological function. Because the grant had already been awarded, these changes required a lot of time and effort to adjust the project plan and gain approval from the funding source. The new design created additional challenges with engineering, culvert construction, and installation. Overall, the project successfully reconnected a large amount of stream and wetland habitat while still providing road use by the tribal community. However, restoration remains somewhat incomplete as natural hydrological function is still impacted by the new structures and remaining rail bed. *Read the full case study here*.

Sundew (*Drosera rotundifolia*), a carnivorous plant found in peat system wetlands. Photo courtesy of Red Lake DNR Water Resources Program.

Tribes have become increasingly active in compensatory mitigation efforts. For example, several tribes have participated in interagency review teams in the Pacific Northwest to help inform mitigation bank design and implementation. Moreover, some tribes are interested in serving as long-term stewards for established mitigation banks that provide first foods or other IK/TEK resources. While tribes cannot use WPDG awards to develop a bank, they can fund various foundational activities (e.g., identifying wetland restoration priorities in a watershed, developing IK/TEK performance or monitoring measures, identifying IK/TEK resources appropriate for targeted wetland types) that can lead to establishing well-functioning mitigation banks. Further, some tribes are combining their watershed restoration planning objectives and regulatory program needs by developing mitigation banks or in-lieu-fee programs (e.g., Lummi Nation's Wetland and Habitat Mitigation Bank,[38] the Tulalip Tribes' Quilceda Village In-Lieu-Fee Program,[39] or the Cow Creek Band of Umpqua's Mitigation Bank). The CSKT case study describes one such program *here*.

F. Questions and Answers About the Core Elements Framework and Wetland Program Plans

The Core Elements Framework is helpful, but we cannot do everything at once. What is the best way to start?

As a first step, evaluate the current circumstances that will most significantly impact developing an approach to managing and protecting wetlands in Indian Country, such as:

- Size of reservation or landholdings.
- Tribal population and distribution.
- Quantity and quality of wetlands and aquatic resources.
- Threats and stressors to wetlands and aquatic resources in Indian Country.
- Political and public support or resistance to wetland protection efforts.
- Tribal capacity (e.g., financial, technical, staffing).
- Extent of existing wetlands-related information (e.g., maps, assessments, monitoring data).
- Effectiveness of existing tribal and federal wetland protection efforts.

This type of situation assessment and diagnosis—a "taking stock"—will allow for an informed approach to developing realistic strategies that have the best chance of being effective and efficient. For example, the approach for a tribe with extensive lands, a large population, rich aquatic resources, and multiple resource threats will likely differ from a tribe with limited lands and smaller and fewer wetlands. In the first case, it may make sense for the tribe to invest significantly in identifying and characterizing wetland resources and coordinating tribal, local, state, and federal regulatory efforts; in the second case, a tribe might opt to protect its few wetlands directly through acquisition or conservation easement rather than create some kind of regulatory infrastructure. Additionally, a tribe with TAS status and approved WQS may wish to focus its efforts on developing wetland WQS and diligently exercising its authorities under CWA section 401.

With all the information out there, how do I go about developing a tribal wetland monitoring and assessment program?

One place to learn more about developing a tribal monitoring and assessment program is How Do I Develop a Wetlands Monitoring Program? To avoid "reinventing the wheel," identify and study what states and other tribes have done, particularly in your ecoregion. It may also be useful to review approved WPPs submitted by other tribes and reach out to other tribes to learn about their wetland monitoring and assessment strategies, what methods or protocols they are using, and more. In some cases, it may be possible to rely on existing partnerships or create new ones, with state agencies, nearby tribes, or academic institutions. In addition, it may be possible to recruit citizen volunteers to help gather certain kinds of information.

38 https://www.lummi-nsn.gov/Website.php?PageID=66.

39 https://www.nawm.org/pdf_lib/epa_region_10_webinar/quil_ceda_village_in_lieu_fee_program_062519_warner.pdf.

We want to use a rapid assessment method (RAM) to support our regulatory program and other wetland management strategy efforts. There seem to be a lot of choices. How do we decide which one is best?

Many wetland scientists and practitioners have developed RAMs, and a good first step is to evaluate existing tools.[40] Another key factor relates to how the assessment information will be used. For regulatory decisions? Prioritizing areas for acquisition or other protection? Some approaches will be more useful than others depending on the intended purposes. In some cases, RAMs have been "regionalized" to increase their suitability for use in certain geographic areas. In addition, some states and academic institutions have developed geographically targeted RAMs. In deciding how to proceed, first conduct a review of the existing literature. Next, reach out to federal, state, and other tribal wetland program managers and regulators in your area for advice and input about what tools might best fit the tribe's specific situation.

Given that the CWA provides national protection for wetlands, why should tribes consider developing their own regulatory programs? After all, wetland regulations are frequently controversial and operating a regulatory program is a significant investment.

In deciding whether to regulate wetland impacts, and defining the scope of regulation, a tribe will need to consider the pros and cons of various options. There are several potential advantages to tribal regulatory programs. Tribal staff have expertise in local resource needs and are often well-positioned to use professional judgment to allow, prohibit, or condition alteration of wetland resources. Tribal knowledge of priority issues and related aquatic programs, backed by the support of the tribal council, may result in strong and common-sense protection of wetland resources. Moreover, tribal programs can be more efficient than federal programs by using local staff and offices to provide a prompt permitting decision. In some cases, tribal regulations fill gaps in federal law, protecting small but locally or culturally significant wetland areas or regulating activities not covered under the CWA. Tribal programs may protect ecosystem services and cultural values that may not be a focus of or covered by federal law. Tribal members may also accept and comply with tribal regulatory requirements more readily than with federal requirements.

With staff limitations, it is difficult to enforce regulatory requirements in remote areas of the reservation. How can that issue be managed?

Enforcing regulatory requirements is sometimes difficult, even for programs with sufficient staff and funding, and it can become especially challenging in the tribal context. Issues may arise related to either unpermitted activities (e.g., working without authorization) or compliance (e.g., operating in violation of permit conditions). In areas where the tribal community may be unaware of regulatory requirements or where monitoring activities is difficult due to staff limitations, it may be useful to conduct periodic spot inspections, which can help foster a culture of compliance Where there are widespread enforcement issues, tribes may need to consider the pros and cons of reallocating scarce resources to comprehensively address the concerns.

Without TAS status, can a tribe develop WQS for wetlands and exercise section 401 authority under the CWA?

While a tribe is always free to develop WQS pursuant to its authorities, for the WQS to be in effect for CWA purposes, a tribe must receive TAS authority under CWA section 303(c) to administer a WQS program and obtain EPA approval of the tribe's WQS pursuant to CWA section 303(c). In addition, a tribe cannot exercise section 401 authority under the CWA unless it receives TAS status for section 401. Until a tribe receives TAS status for section 401, EPA is the CWA section 401 certifying authority for federal permits and licenses in Indian Country, per 33 U.S.C. 1341(a)(1). As the certifying authority, EPA may look to a tribe's existing water quality requirements in other tribal laws, ordinances, or codes, in addition to the several CWA provisions listed in section 401 as considerations.[41]

40 For example, see https://www.epa.gov/wetlands/wetlands-monitoring-and-assessment and https://nepis.epa.gov/Exe/ZyPDF.cgi/P1003GXN.PDF?Dockey=P1003GXN.PDF.

41 As of this guide's writing, EPA is developing, but has not completed, a proposed rule to establish federal "baseline" WQS for Indian reservation waters that currently do not have CWA-effective WQS in place, with a few exceptions. Once promulgated, federal baseline WQS will be available for EPA to use in section 401 water quality certifications. where EPA is the certifying authority. See https://www.epa.gov/wqs-tech/promulgation-tribal-baseline-water-quality-standards-under-clean-water-act

IV. Getting Help

Developing and implementing a comprehensive Wetland Program Plan (WPP), particularly for tribes with significant aquatic resources, can be a substantial undertaking. Tribes may face financial constraints, constraints on available technical expertise and staffing, data management issues, and political support, among other challenges. A number of tribes have WPPs approved by the U.S. Environmental Protection Agency (EPA), while other tribes are developing plans. Some tribes have staff dedicated to wetlands work, while other tribes rely on natural resource and environmental staff to fill those needs. Many tribes are stretched thin with limited resources and staff.

Tribes frequently identify obtaining reliable program funding as one of the most significant impediments they face in carrying out existing WPPs. Indeed, funding may be the most critical issue for determining tribal capacity to manage and protect their wetlands. Tribes without tribally supported and funded wetland programs report that wetland protection efforts fluctuate with funding. Moreover, each type of grant seems to have a different application and reporting process. An oft-repeated recommendation from tribes has been to establish sustainable base funding for wetland programs.[42] Tribes have cited various recurring rationales for this recommendation, including promoting program stability, appropriately rewarding proven programs, allowing allocation of effort to where it is most needed, reducing transactional costs and staffing volatility, allowing for more predictable planning efforts, and funding program implementation actions and activities.

Actions identified in WPPs commonly require additional staff and resources. Effective WPPs often include a multi-year funding strategy with goals, outcomes, and benefits that can be understood by tribal officials, funders, and other decision-makers. As a practical matter, achieving objectives articulated in WPPs may require and include receiving funding from multiple sources.

While EPA does not require including "sustainable financing" or addressing budgets or other specific financial information in WPPs, tribes may want to consider doing so. A sustainable financial plan involves identifying what is needed to accomplish the work the tribe anticipates and seeking funding sources and/or project partners to help make it happen. As an example, the Yurok Tribe's WPP indicates that it intends "to outline YTEP's [the Yurok Tribe Environmental Program's] program development needs and objectives and better plan for future funding and coordination opportunities." Meanwhile, the Salt River Pima-Maricopa Indian Community tasks its senior environmental specialist with preparing grant requests and coordinating with other tribal departments and external agencies.

In some cases, a WPP specifically identifies grants and other funding sources that tribes will pursue or even identify "sustainable financing" as a separate core element. For instance, the Goshute Reservation identified several federal sources from EPA, the U.S. Department of Agriculture, and the Bureau of Indian Affairs (BIA) in its WPP, as well as plans to seek funding from the states of Utah and Nevada. The Fort Belknap Indian Community outlines potential uses for a Wetland Program Development Grant (WPDG) over a five-year period, tying a potential funding source to specific tasks in the WPP. The Hopland Band of the Pomo Indians similarly discuss plans to use bond money and associated matching funds for constructing fish passage improvements.

Beyond identifying funding sources, tribes following a sustainable finance framework also seek out governmental and non-governmental partners to help them complete their work. Several WPPs include information on these program partners. The Chippewa Cree listed several partners from within the tribe, state and federal agencies, and consultants to help with their sweet grass reintroduction project. Pointing to other examples, both the state of New Mexico and the Salt River Pima-Maricopa Indian Community identified key federal, state, and tribal partners as well as their anticipated roles in their WPPs.

WPDGs (see below) provide the most direct funding opportunity for tribal wetland program development, although they do not provide a dedicated source for program implementation and operation. Consequently, tribes typically need a multi-faceted approach to develop, implement, and sustain a wetland program. This can include tapping multiple funding sources, creating internal efficiencies, and establishing productive partnerships with other tribes, state or federal governments, academic institutions, and other partners.

42 See, for example, Consensus Building Institute and Lucy Moore Associates. 2016. Tribal Wetlands Project: Arid Southwest and Rocky Mountain Eco-Regions Assessment Report.

Bog cranberries (*Vaccinium oxycoccos*), Snoqualmie ancestral peatland. Photo courtesy of Snoqualmie Tribe (Alex Harwell).

Fingers in Many Pies: The Havasupai Reservation Example

In its WPP (on page 11), the Havasupai Tribe laid out a funding strategy: "CWA Section 106 Water Pollution Control Program grants for federal assistance to support water quality monitoring, assessment, and protection, including wetlands. CWA Section 104(b) (3) Wetlands [grants] to provide federal financial assistance and are used for wetlands protection and management. Indian Environmental General Assistance Program (GAP) grants for environmental program development and infrastructure for the environmental protection department including wetland resources. The Bureau of Indian Affairs (BIA) has trust responsibility on the Havasupai Reservation and can provide technical and financial (638 funds) assistance and resources when available that include addressing Tribal wetland resources. The Natural Resources Conservation Service (NRCS) can provide technical and financial assistance when available that include addressing Tribal wetland resources. The USFWS can provide technical assistance and competitively-awarded financial assistance through a Tribal Wildlife Program grant."

Tribal wetland programs must somehow pay for personnel, lab supplies, travel, contractual work, data management, mapping, website maintenance, outreach and education, training, permitting (e.g., site visits, applications), vehicles for fieldwork, overhead expenses, grant administration, and other costs. Because many tribes have limited funds for environmental programs, wetland programs often seek to identify additional funding sources. A tribe may partner with another agency on a grant, where each entity provides part of the funding. While EPA's WPDG (see below) has been an important source of support for many tribal wetland programs, those funds can only be used for program development (e.g., writing regulations but not issuing permits in an ongoing program). Most tribal wetland programs are therefore funded through a combination of sources.

A. Wetland Program Development Grants

WPDGs allow applicants to develop and refine comprehensive tribal government wetland programs. At present, there are three different kinds of WPDG requests for applications (RFAs). The first RFA is a national set-aside competition for tribes and intertribal consortia. The second is a regional competition for tribes, states, territories, local governments, interstate agencies, and intertribal consortia. Finally, the third RFA is a national competition for nonprofit organizations, nongovernmental organizations, interstate agencies, public and private universities and colleges, and tribal consortia. WPDGs assist tribes (as well as states, territories, and local governments) in building programs that protect, manage, and restore wetlands. Tribes are eligible to respond to both regional and national RFAs. Regional RFAs are usually announced in odd years, whereas the two different national RFAs are typically announced in even years.[43] All WPDGs are intended to:

- Build capacity to increase the quantity and quality of wetlands in the United States by conserving and restoring wetland acreage and improving wetland condition.
- Use one or more of the core elements discussed above to achieve this goal.

43 The FY 2020–2021 RFA can be viewed here: https://www.epa.gov/sites/default/files/2020-10/documents/hq_fy20-21_wpdg_rfa_-_2020_october_29_final.pdf

Tribal grant competitions focus primarily on the national tribal set-aside and the regional WPDGs. The primary focus of these grants is to build tribal, state, and territory wetland programs. Since 2016, EPA has funded a national tribal WPDG competition that has included two tracks. Track One is for proposals to develop a WPP or carry out projects from an EPA-approved WPP. Track Two is for proposals that are consistent with one or more of the four core elements. For the regional WPDGs, EPA regions may add specific priorities that are compatible and consistent with the core elements and actions in the appendix of development and refinement actions found at https://www.epa.gov/wetlands/wetland-program-development-grants.

EPA's Wetland Grants Database contains information about past awards of WPDGs and contains searchable and filterable grant data, a three-year demonstration pilot program (the "pilot grants"), grant case study narratives, and model products created by grant recipients. Tribes may be able to find case studies and previous awards in the database, as well as products or deliverables from past WPDGs, that can inform their current proposals (e.g., project design, deliverables).

Putting WPDGs to Use

The **Washoe Tribe of Nevada and California** has long known the importance of wetlands. Consequently, the tribe's beliefs and practices to protect the health of wetlands have been transmitted from generation to generation. Plants found only in certain wetland areas continue to provide food and medicine, and today the Washoe are committed to protecting the few remaining wetlands from further degradation and restoring those that have been destroyed or degraded. The tribe has made significant strides in defining its wetland systems through the support provided by three WPDGs. The Washoe Tribe's Trust Lands are scattered throughout two states, creating challenges for identifying and protecting wetland resources. However, the tribe's Department of Environmental Protection has made significant strides in protecting its wetlands and educating the Washoe community about these vital resources.

Tribes may find some aspects of the WPDG program challenging. For some tribes, the message may almost seem to be "nothing fails like success," when, as good performers, they are less likely to receive ongoing support. For others, those with the greatest challenges seem to be at a disadvantage. Some have speculated that compared to tribes, state natural heritage programs and other state efforts—often with highly educated staff and experts—seem to receive a disproportionate amount of funding. One recurring suggestion from tribes has been an approach that includes a base funding component with a competitive overlay. Currently, grant funds are seen as "soft money" that cannot be relied on for long-term needs, such as funding a wetland coordinator position through multiple years. Rolling funds over from one year to the next would give tribes a more secure future in protecting their wetlands. In addition, some tribes face internal challenges that can complicate meeting deadlines, such as difficulty gaining access from landowners or tribal government processes.

A report prepared by the Pacific Northwest Tribal Wetlands Working Group (PNW TWIG)[44] identified obstacles tribes face in meeting grant requirements, such as the 25 percent match for stand-alone grants not part of Performance Partnership Grants and high staff turnover, which might partially be a result of grant funds being "two-year money." In some cases (as described below), tribal wetland programs may also be able to access funds from other sources to support WPP implementation, such as Clean Water Act (CWA) sections 104, 106, and 319; they may also be able to get monies from other federal agencies such as BIA and the U.S. Fish and Wildlife Service (USFWS).

B. Other Sources of Funding

A good place to learn and remain updated about funding opportunities is through EPA's regional Enhancing State and Tribal Programs staff. In addition to the WPDG program, there are several other annual or periodic sources of funding tribes can consider. These may either be "internal" (e.g., within the tribe's control) or "external" (e.g., grant programs). Several of the more common government-run opportunities are listed below. Beyond recurring, periodic government programs, tribes may be eligible to submit proposals and compete for support from private foundations.

44 Baerwalde, M. 2020. Summary of Barriers to Developing New or Renewing Expired Tribal Wetland Program Plans. Pacific Northwest Tribal Wetlands Working Group.

Five-Star Wetland and Urban Waters Restoration Grant

The Five-Star and Urban Waters Restoration Programs support education and training through projects that restore wetlands and streams. The program provides challenge grants, technical support, and chances for information exchange to enable restoration projects. Funding levels are modest ($10,000 to $40,000), with $20,000 being the average amount awarded per project. However, especially when combined with partner contributions, restoration projects funded under this program can demonstrate meaningful environmental improvements. Importantly, they can fund implementation of restoration projects that may have been identified and planned under a WPDG or WPP.

Pentaquin River Watershed Alewife Restoration and Outreach

The Passamaquoddy Tribe received a Five Star Grant to repair two fish ladders that had been inhibiting river herring passage within the Pennamaquan River watershed in Maine. The project engaged 15 Tribal community members to help construct and install improved fish ladders and restore migratory connections to the river, tripling the current river herring population. Project partners include Maine Coast Heritage Trust, Maine's statewide land trust, and Maine Sea Grant.

Clean Water State Revolving Fund and Wetlands

In 1987, Congress amended the CWA and created the Clean Water State Revolving Fund (CWSRF) to finance projects that improve water quality. The 51 individual revolving funds combine federal and state money to provide low-interest loans for eligible projects. The CWSRF provides more than $5 billion annually to public and private organizations to improve water quality. As the loans are repaid, money can be used again for new projects—a true revolving fund. Wetland preservation, restoration, and creation projects have historically been eligible for funding under the CWSRF.

Water Pollution Control Section 106 Grants

CWA section 106 authorizes EPA to provide financial assistance to states (including territories and the District of Columbia), eligible interstate agencies, and tribes in the form of water pollution control grants. CWA section 106 grants provide funding to build and sustain water quality programs. Funding from section 106 grants, unlike WPDG monies, can be used for program implementation purposes including hiring staff, purchasing equipment, attending trainings and workshops, and other aspects of implementing a wetlands program. In addition, section 106 grants can be allocated to monitoring and assessment programs, developing water quality standards (WQS), and developing WPPs.[45]

Nonpoint Source Water Pollution Section 319 Grants for States and Territories

Under CWA section 319, EPA provides grants and technical assistance to support tribal environmental programs in assessing and managing nonpoint source (NPS) pollution problems and threats. A wide range of activities are eligible for funding, including but not limited to NPS training for tribal staff, watershed plan development, riparian planting, livestock exclusion fences, lake protection and restoration activities, ordinance development, outreach and education, and more. Tribes eligible for and receive base section 319 grants can also apply for the periodic competitive section 319 grants.[46]

45 For more information on tribal water quality monitoring CWA section 106 grants, see https://www.epa.gov/water-pollution-control-section-106-grants/tribal-grants-under-section-106-clean-water-act and https://www.epa.gov/water-pollution-control-section-106-grants/tribal-grants-under-section-106-clean-water-act#tribaleligible

46 For more information on tribal NPS CWA section 319 grants, see https://www.epa.gov/nps/tribal-nonpoint-source-program and https://www.epa.gov/nps/tribal-nonpoint-source-program#Eligibility

Protecting the Pee Posh Wetlands from NPS Pollution

The Gila River Indian Community is located in south-central Arizona. The Pee Posh Wetlands, which are high-quality wetlands in the northwest corner of the community, have been threatened by sedimentation and floating debris originating from the suburbs of Phoenix to the north of the reservation.

To mitigate NPS pollution to the Pee Posh Wetlands, the Gila River Indian Community proposed measures to prevent sediment and debris from entering the wetlands. Sediment pollution has resulted in a suspended sediment concentration of 98.7 mg/L, in excess of the tribal draft standards. Floating debris are commonly caught in native wetland vegetation. Restoration proposed under the grant includes the installation of both a sediment basin and a trash control structure to prevent excess sediment and trash from entering the wetlands. These measures are expected to minimize the effects of sediment and debris on the Pee Posh Wetlands.

Indian Environmental General Assistance Program[47]

In 1992, Congress passed the Indian Environmental General Assistance Program (GAP) Act, which authorized EPA to provide GAP grants to federally recognized tribes and tribal consortia for planning, developing, and establishing environmental protection programs and developing and implementing solid and hazardous waste programs in Indian Country. The goal of GAP is to assist tribes and intertribal consortia in developing the capacity to manage their environmental protection programs in accordance with individual tribal needs and applicable federal laws and regulations.

Additional funding opportunities may arise through other federal agencies, including USFWS, BIA, the Natural Resources Conservation Service (NRCS), and the USACE.[48]

Furthermore, one source of funding might be through "self-generating" revenues from tribal permit or CWA section 401 certification application fees and penalties received from enforcement actions. For example, the Swinomish Tribe charges a $250.00 processing fee for CWA section 401 water quality certifications.[49]

C. Tribal Collaboration Efforts and Partnerships

Intertribal and intratribal collaboration efforts, partnerships, and other cooperative arrangements can yield significant benefits for tribes and may take numerous forms. In some cases, tribes have created consortia or working groups to address issues of common interest, collectively pursue projects, or share information and expertise. Other tribes have formed partnerships with local, state, or federal government agencies or academic institutions. In some cases, partnerships focus on one or more discrete issues and are of limited duration; in other circumstances, tribes create standing arrangements that cover multiple matters of shared interest. Partnerships may also be "internal," where connections are forged between different departments or entities within a tribal government. Including a specific section relating to existing or planned partnerships and collaborative efforts in a WPP can be helpful both for planning purposes and to improve funding prospects.

Wild rice, a culturally significant food plant of critical importance to many tribes in North America. *Zizania aquatica* and *Zizania palustris* are two species of wild rice, called manoomin in Ojibwe. Photo by Puthuchon.

47 For more information on Indian Environmental GAP grants, see https://www.epa.gov/tribal/indian-environmental-general-assistance-program-gap.

48 See, for example, Indian Environmental General Assistance Grants and https://www.nawm.org/wetland-programs/sustainable-finance/.

49 For example, see the Swinomish Tribe's CWA section 401 certification application form and fees at https://swinomish-nsn.gov/media/122671/20210914_401wqcertificationapplication.pdf.

Intertribal Collaboration

One longstanding and highly successful example of intertribal collaboration is in the Pacific Northwest (EPA Region 10), which covers the 271 tribes within the states of Alaska, Idaho, Oregon, and Washington. EPA Region 10 received funds to convene tribes in the Pacific Northwest in 2009, and that initial effort eventually developed into the Pacific Northwest Tribal Wetlands Working Group (PNW TWIG.)[50] This tribally directed, self-sustaining group meets regularly and provides valuable peer-to-peer training, largely sustained through EPA WPDGs. The PNW TWIG exists to share knowledge from a tribal perspective that supports restoring and protecting wetlands and other aquatic resources. The PNW TWIG specifically aims to::

- Promote wetland and aquatic resources training opportunities for tribes.
- Provide a venue for sharing information and transferring technical expertise regarding restoration, protection, and management strategies for wetlands and aquatic resources between staff of Pacific Northwest and Alaska tribes.
- Support development and implementation of wetland and aquatic resource monitoring strategies.
- Increase awareness of the cultural importance of wetlands and aquatic resources.

In 2011, the Yakama Nation hosted the first PNW TWIG training, which focused on techniques and design of the National Wetlands Condition Assessment (NWCA), with training provided by EPA Region 10 technical staff. Since then, tribes and their partners have convened semi-annual workshops and trainings across Washington, Idaho, and Oregon. These gatherings have grown to include both field and office presentations and focus on the issues and efforts of the host tribe. Each WPDG that has supported the PNW TWIG includes funding for travel so tribes can meet in person. More than 40 tribes from throughout the region have participated in the PNW TWIG, which typically holds two meetings per year, hosted by different tribes. The host tribe sets the agenda for the two- or three-day meeting, which opens with a cultural ceremony and includes field trips focused on the host tribe's current projects (e.g., restoration projects, monitoring protocols). Examples of meeting themes include developing mitigation banks, developing WPPs, increasing technical capacity, and monitoring and assessment.

Another example of sustained intertribal coordination is the Wisconsin Tribal Conservation Advisory Council (WTCAC), which established a forum in 2001 for the 11 federally recognized Native American tribes in Wisconsin.[51] WTCAC aims to identify and solve natural resource issues on tribal lands by working cooperatively on important conservation issues of mutual interest to its members. A number of years later, in 2015, the Council established a wetland subcommittee to identify tribal wetland program needs, thus establishing the WTCAC Tribal Wetland Working Group (WI TWWG), the first tribal working group in EPA Region 5. Its objectives are to promote training opportunities for tribes; provide for information sharing and transfer of technical expertise regarding restoration, protection, assessment, and management of aquatic resources; and foster a more widespread awareness and appreciation of the cultural importance of wetlands. Its first meeting was at the 2016 Wisconsin Wetland Association Annual Science Conference, and the WI TWWG was made an official subcommittee of WTCAC in March 2017. Since its inception, the WI TWWG has had multiple meetings and received funding from EPA Region 5 for training on wetland assessments (e.g., Wetland Rapid Assessment Methodology 2.0, Sampling Protocol for Wetland Floristic Quality Assessment). Additional upcoming activities include restoration site visits and training, basic wetland delineation training, and a tribal wetland video series.

In some cases, wetland issues are—or can become—part of an already established collaborative effort. For instance, the Great Plains Tribal Water Alliance, Inc. (GPTWA), an independent corporation, serves as an advisory committee on water issues to the Great Plains Tribal Chairmen's Association. Established in 2006 by the Standing Rock, Oglala, and Rosebud Sioux Tribes, GPTWA now includes the Flandreau Santee Sioux Tribe as well as other tribal nations in the Great Plains region. Committed to preserving the member tribes' reserved water rights in the Missouri River, the GPTWA mission statement is long term, promising that, "As its sacred obligation, the Great Plains Tribal Water Alliance will provide technical and policy recommendations for the protection of all water resources for the next 7 generations."

50 https://pnwtwig.wordpress.com/.

51 https://www.wtcac.org/.

Beautiful elephant heads (*Pedicularis groenlandica*) and camas (*Camassia quamash*) meadow located on Musselshell Meadows. Photo courtesy of Rue Hewett Hoover.

Other examples of tribal collaboration include:

- Tribes work together in "stream teams" on project monitoring, stream sampling, and stabilization. Stream teams move from one tribal location to the next for monthly or quarterly working meetings.
- The Institute for Tribal Environmental Professionals, based in Flagstaff, Arizona, is a useful forum for tribal training and information exchange.
- The United Southeast Tribes is a regional forum for tribal networking on environmental issues.
- Three Oklahoma tribes have initiated a pilot project to explore their capacity for cooperation in method sharing and other technical issues. Each tribe contributes a share of its CWA section 106 monies to support the effort, focusing on skills exchange relating to geographic information systems (GIS), cultural resources, natural resources, and more. The plan is to invite non-Indian partners as appropriate. A related effort is the Tribal Environmental Coalition of Oklahoma, a potential forum for sharing wetland information.
- The Northwest Indian Fish Commission is an organization composed of multiple staff and member Pacific Northwest treaty tribes. The focus is on protecting treaty resource rights, including protecting and restoring Endangered Species Act–listed anadromous or salmonid fish runs in and around the Puget Sound of Washington State while also considering broader watershed protection issues.
- Similarly, the Columbia River Intertribal Fish Commission is an organization composed of multiple staff and member tribes that have usual and accustomed territories in the Columbia River basin.

Collaboration with Outside Partners

Tribes have collaborated successfully with non-tribal partners.[52] EPA Regional Tribal Operations Committees also provide important forums and opportunities for tribes to gather with EPA, exchange information, and offer guidance. Some states, such as Washington, have a wetland monitoring and assessment workgroup, including members from federal, state, tribal, and academic organizations. In certain circumstances, tribes may draw on the expertise of state fish and wildlife biologists, NPS managers, or state floodplain engineers. Such coordinated efforts make sense in terms of resource management and make effective use of limited staff resources. For example, the Blackfeet Nation has coordinated development of WQS with the Montana Department of Environmental Quality by examining baseline water quality sampling data from new permit applications and the monitoring studies conducted in past years. This effort has helped the tribe integrate wetland WQS into monitoring and assessment plans and regulatory permit reviews.

As noted above (see text box, page 27), the Prairie Band Potawatomi Nation and NRCS commemorated the approval of an Agricultural Conservation Easement Program Wetland Reserve Easement, the first tribal wetland long-term contract established in Kansas, and one of only a handful throughout the United States. The tribe entered into a 30-year contract with NRCS to restore the functions and values of an existing wetland located on the Prairie Band Potawatomi Reservation.

The Stockbridge-Munsee Community (SMC) used an EPA WPDG award to improve outreach and education efforts for their water resources programs, particularly within the tribal community. SMC created a series of ArcGIS story maps, which are a method to combine maps, narratives, photos, and videos to convey information in an engaging and interactive way. SMC contracted St. Mary's University of Minnesota, GeoSpatial Services, to assist with website design and the creation of the story maps that display:

- SMC's history and cultural connection to water.
- An overview of SMC water resources and the water resources programs.
- A summary of the SMC potentially restorable wetland (PRW) mapping project.
- An interactive map of stream quality and PRWs within the watershed.

52 See Appendix B for case study descriptions.

- Highlights from past water resources projects.
- An overview of the Miller Creek stream and wetland restoration project.

There may also be opportunities to interweave wetland management with other resource programs important to a tribe and its partners to achieve more widespread benefits. Explicitly defining these links in a WPP encourages collaboration. Some possible areas where either "internal" collaboration between tribal departments or "external" partnerships with outside parties may be fruitful include:

- Incorporating wetland issues in CWA section 319 NPS programs, and specifically in developing watershed plans. Restoring, enhancing, or establishing wetlands and riparian areas can increase protection of other waters as well.
- Considering wetlands creation, restoration, and protection within the landscape in total maximum daily load programs to reduce or manage NPS loading from the specific sources in the watershed.
- Including wetlands in integrated programs that report and list impaired waters.
- Integrating wetland and floodplain management programs, such as wetland restoration, to address restoring stream hydroperiods and connectivity.
- Protecting critical habitat for waterfowl and other wildlife, including other birds, reptiles, amphibians, and mammals. This may also include provision of habitat corridors linking other aquatic and natural areas.
- Restoring wetlands as part of an Endangered Species Act watershed-based recovery plan to, for example, restore habitat for salmon and other anadromous fish.
- Safeguarding rare community types, such as bogs, fens, and vernal pools.
- Considering wetland functions in agricultural and silvicultural areas, including water storage, evapotranspiration for local rainfall, greenbelts
- along stream systems, and for some types of timber production.
- Supporting economic contributions through hunting and fishing, bird watching, canoeing, and kayaking, and other activities.
- Maintaining and restoring culturally significant wetland places for their traditional foods, fibers, and medicine plant communities, and for the myriad ecological and cultural benefits they provide.

Although the benefits of partnerships and other collaborative efforts are clear, some challenges exist to creating and sustaining effective collaboration. There may be significant differences in levels of expertise, experience, and resources among participating tribes. Tribal procedures, decision- making processes, and timelines sometimes conflict. Typically, it is important to have certain people willing and able to take the lead in forming and sustaining such a collaborative effort through its founding stage. Staff turnover and administration changes can be a stumbling block for consistency of effort. Some tribes may be interested in collaborating but are too isolated or do not have the time and money required to travel—especially smaller bands with fewer resources. Some tribes do not have a contiguous land base or a reservation, limiting their ability to relate to other jurisdictions. Finally, for some tribes, their uniqueness, history, or cultural beliefs and practices may inhibit collaborating too closely with other tribes or inhibit trust in other entities.

Bee pollinator on wapato (*Sagittaria latifolia*) flower, Snoqualmie Valley. Photo courtesy of Snoqualmie Tribe (Alex Harwell).

D. Funding and Sustaining Wetland Programs Questions and Answers

Is there a place where I can review the range of tribal projects that EPA has funded under the WPDG program?

Yes. A list of previously funded projects is posted at EPA's Wetland Grant Database, located at https://iaspub.epa.gov/apex/wgd/f?p=101.

It would seem that EPA has a number of specific requirements associated with WPDG applications. Where can I find the most up-to-date information?

Tribes should monitor the relevant EPA websites and also develop a solid working relationship with the EPA tribal, wetland program, and grant coordinators in their regions. A good place to start is https://www.epa.gov/wetlands/wetland-program-development-grants-and-epa-wetlands-grant-coordinators. Developing a relationship with EPA regional tribal coordinators and regional tribal leads for EPA's Enhancing State and Tribal Program initiative is especially important because requirements can change over time. Agency staff can provide technical assistance and often have more up-to-date or complete information than may appear on the website.

Must a tribe have TAS status in order to receive a WPDG?

Tribes must be federally recognized but having "treatment in a similar manner as a state" (TAS) status is not required. Intertribal consortia must meet the requirements of 40 CFR §35.504(a) and (c).[53] The Tribal WPDG RFA describes the grant selection and award process for eligible applicants.

Where can I learn what activities are eligible or ineligible to be funded under a WPDG?

A list of example actions that are eligible for funding under each WPDG RFA is under the "Program Building Activities" menu for each core element at https://www.epa.gov/wetlands/wetland-program-development-grants-eligible-activities.

Will WPDG funding support implementation of wetland programs?

No. WPDG funds cannot be used for wetland program implementation. An implementation project is accomplished through routine or ongoing established practices or through routine tasks. An implementation project does not involve developing a program, providing a pilot study, transferring data or information, or advancing the state of knowledge. Importantly, however, monitoring and mapping typically always involves some kind of information transfer or advancing the state of knowledge. Monitoring and mapping projects, and even ongoing monitoring work, are therefore eligible for WPDG funding and are not considered "implementation.

It looks like EPA has two "applicant tracks" for funds. How does a tribe know what is the better track under which to apply?

There are two separate tracks for eligible applicants. Eligible tribes can submit applications under either Track One or Track Two, while eligible intertribal consortia can only submit applications under Track Two. Applicants under each track will only compete with other applicants for awards in the same track. A tribe seeking to develop a WPP, or a tribe that already has an approved WPP, should submit under Track One. If the application includes developing a WPP, it is beneficial to include additional tasks to develop one or more of the core elements (e.g., developing a WPP and a pilot project to inventory wetlands in Indian Country). A tribe that does not have a WPP and does not plan to develop one must submit under Track Two. Intertribal consortia also must submit under Track Two. While there is no preference given to applications under either track, Track One typically has a larger pool of funds. As a general rule, tribes should contact EPA for guidance and input before EPA issues a solicitation because, once it is out and the competitive process is underway, EPA is restricted from providing any type of special assistance to an applicant

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53 http://www.ecfr.gov/cgi-bin/text-idx?SID=ee8aaaeb886b62da5acc07bba026ab76&mc=true&node=se40.1.35_1504&rgn=div8

Does the WPDG program have a match requirement? If so, can the match be reduced?

Yes. There is a minimum non-federal 25 percent cost share/match requirement for standalone grants (i.e., grants that are not part of a tribe's Performance Partnership Grant). In their application, all applicants must describe how they will contribute the required match. In certain instances, the match requirement may be waived if the tribe is able to demonstrate the need for doing so. EPA announced the waiver of match funding requirements for tribal grants authorized under Performance Partnership Grants on September 30, 2021.[54]

Can BIA funds be used to meet the match requirement? What about other EPA grant funds?

In general, most BIA assistance funds can be used for match. Tribes should check with their BIA contacts to determine whether their funds can be used as match for other federal grants. EPA GAP, CWA section 319, or CWA section 106 funds cannot be used as match for these EPA WPDGs. Note, however, that salaries coming from other federal (i.e., non-EPA) grants can be used as cost share/match. Salaries paid from another federal source may count as match for a grant if allowed by the grant program source.

Intertribal cooperation sounds good in theory, but what's the best way to start and sustain?

There is no set process to create and sustain intertribal cooperation. Existing successful collaborative efforts have shown that participating tribes need to have a shared set of interests. These might include:

- Obtaining training in specific topics of interest, such as mapping, monitoring and assessment, wetland WQS development, and more.
- Comparing approaches to current wetland protection challenges.
- Grappling with common impacts or threats to wetlands.
- Sharing complementary skills.
- Developing consistent approaches (e.g., mitigation policies, CWA section 401 certification condition templates).
- Looking for ways to create economies of scale (e.g., one training for multiple tribes).

In addition, it is true that good collaborative efforts do not necessarily arise spontaneously or become naturally self-sustaining. Experience has shown the value and importance of having two to three people who are strongly committed to bringing tribes together and have the interpersonal skills needed to champion the effort within their own leadership, to other tribes, and to other potential partners. A single champion may have a difficult time cheerleading the effort and carrying the multiple responsibilities, including organization and logistics.

Finally, it is important to think carefully about the "infrastructure" needed to sustain such efforts. For instance, who will be responsible for hosting meetings and the associated logistics? Will duties rotate among member tribes? What competitive advantages for funding opportunities might be realized by working in concert with other tribes? In short, intertribal collaboration efforts will most likely make sense and yield mutual benefits when tribes share substantive issues of concern and interest, several people are determined to make it happen, and tribes put the process and procedural issues (e.g., who does what when, travel, funding) in place.

54 See September 30, 2021, memo from Michael Osinski, Director of Grants and Debarment, at https://www.epa.gov/grants/rain-2022-g01

Appendix A: Roundtable Members

Matt Baerwalde, Snoqualmie Indian Tribe

James Duffield, Hopi Tribe

Tom Elliott, Yakama Nation

Tabitha Espinoza, Confederated Salish and Kootenai Tribes

Rick Gitar, Fond du Lac Band of Lake Superior Chippewa

Rue Hewett Hoover, Nez Perce Tribe

Mike Jones, Mohican Nation—Stockbridge-Munsee Band

Kathleen Kutschenreuter, EPA Headquarters

Kerstien McMurl, Iowa Tribe of Oklahoma

Robyn Mercer, Pyramid Lake Paiute Tribe

Tyler Orgon, Red Lake Band of Chippewa

Toney Ott, EPA Region 8

Verna Potts, Prairie Band Potawatomi Nation

Kelly Schott, Meskwaki Nation; Sac & Fox Tribe of the Mississippi in Iowa

Benjamin Simpson, Penobscot Indian Nation

Tiernan W. Smith, St. Regis Mohawk Tribe

Marla Stelk, National Association of Wetland Managers

Linda Storm, EPA Region 10

Rachel Vaughn, Southern Ute Indian Tribe

Kerryann Weaver, EPA Region 5

Yvette Wiley, Iowa Tribe of Oklahoma

Appendix B: Case Study Summaries

The Finley Flats Wetland Preserve. Photo courtesy of Tabitha Espinoza.

CATEGORIES:

Regulatory programs

Restoration, including voluntary restoration and compensatory mitigation

Traditional Ecological Knowledge

Location: North of Interstate 90 between Missoula and Kalispell, fertile valleys and towering mountain peaks of northwestern Montana surround the Flathead Reservation.

Size of Tribal Lands/Reservation Acreage: 1.3 million acres

Population: CSKT has ~8,050 enrolled members; about 5,000 live on or near the reservation.

Size of Wetlands: The Flathead Reservation contains about 980 miles of rivers and streams, 90 lakes, and extensive wetlands.

EPA Region: 8

Wetland Program Plan (WPP) Status: WPP developed under a Wetland Program Development Grant for 2021–2025, incorporating four of four core elements (available here)

Tribal Website: https://csktribes.org/

Case Author: Tabitha Espinoza, CSKT wetlands program

Confederated Salish and Kootenai Tribes | CSKT Wetlands Restoration Efforts

As the largest landowner on the Flathead Indian Reservation, the Confederated Salish and Kootenai Tribes (CSKT) can affect conservation through voluntary restoration and protection efforts as well as through compensatory mitigation.

CSKT has reserved rights dating back to 1855, when the Hellgate Treaty was signed. The tribes have a right to fish in "all usual and accustomed places." Built into that right are the assumptions that the fish exist and that the habitat exists to support them. So, when an entity damages habitat for culturally important species in CSKT's aboriginal territories, the tribes' treaty rights have been infringed upon The tribes have persisted through a few key legal battles and won settlements for damages to natural resources in ceded lands. As a trustee, the tribes were obligated to spend the settlements on restoration to aquatic resources within the reservation.

CSKT also has a stringent Wetlands Conservation Plan, which was implemented to reach the goal of "no net loss" of wetland acreage across the reservation beginning in the late 1990s. The plan provides for monitoring, assessment, and mapping of the reservation's wetland resources. Most notably, though, the plan (along with various tribal ordinances) is a tool that holds developers accountable for unavoidable impacts to wetlands. Wetland impacts must be mitigated at an average ratio of 3:1. That means for every acre of wetland impact, 3 acres of wetlands are preserved, restored, enhanced, or created.

Since establishing the Wetlands Conservation Plan, the tribal fisheries and wildlife programs have spent two decades purchasing and restoring aquatic habitats on the reservation for benefits to fish, wildlife, and other tribal values. In working to identify potential restoration sites, the tribal wildlife program consulted with the Séliš-Qĺispé Culture Committee, who shared traditional place-names. Often descriptive in nature, these place-names revealed rich site-specific information about what the various places were like in the generational memory of the tribes

and guided the restoration process. Additionally, for many re-acquired pieces of land, tribal programs consulted with the two Culture Committees to rename mitigation parcels in the native languages. The CSKT wildlife program has been successful in reintroducing northern leopard frogs and trumpeter swans to places in their former range. See details about the efforts of the wildlife program here.

Along with various habitat restoration projects in key watersheds supporting bull trout and Yellowstone cutthroat trout, the CSKT fisheries program has built a series of filtration ponds along Mission Creek to remove pesticides and other contaminants before the stream enters the Lower Flathead River, which is very important culturally and ecologically and is explicitly protected by numerous tribal ordinances.

An important partner to CSKT in wetland mitigation has been the Montana Department of Transportation (MDT). Together, the two governments have successfully implemented various projects of different configurations, as well as facing many challenges. The Finley Flats Wetland Preserve is an example of a collaborative project designed to restore wetlands. The tribes leveraged resources from settlement monies along with funding from MDT and other sources to restore some 200 acres of wetlands there, some of which were used as credits to mitigate impacts of the Highway 93 redesign project that began in the early 2000s and is still underway.

Key Takeaway

Look to your treaties, look to your cultures, and be creative.

Additional Resources

Learn more about CSKT's wetlands conservation program: http://csktnrd.org/ep/wetlands-conservation-program

Wetland assessment work on the Flathead Indian Reservation. Photo courtesy of the Confederated Salish and Kootenai Tribes of the Flathead Nation.

CATEGORIES:

Assessment

Grant-supported projects

Location: North of Interstate 90 between Missoula and Kalispell, fertile valleys and towering mountain peaks of northwestern Montana surround the Flathead Reservation.

Size of Tribal Lands/Reservation Acreage: 1.3 million acres

Population: CSKT has ~8,050 enrolled members; about 5,000 live on or near the reservation.

Size of Wetlands: The Flathead Reservation contains about 980 miles of rivers and streams, 90 lakes, and extensive wetlands..

EPA Region: 8

Wetland Program Plan (WPP) Status: WPP developed under a Wetland Program Development Grant for 2021–2025, incorporating four of four core elements (available here)

Tribal Website: https://csktribes.org/

Case Author: Tabitha Espinoza, CSKT wetlands program

Confederated Salish and Kootenai Tribes | CSKT Monitoring and Assessment

With funding from the EPA Wetland Program Development Grants (WPDGs), the Confederated Salish and Kootenai Tribes (CSKT) Wetland Conservation Program started a comprehensive rotating basin watershed-based approach to wetland assessment and monitoring in 2004.

Due to the competitive nature of this funding source, the program has started and stopped a few times over the years and staff turnover has been prominent. As a result, the original strategy has been jolted and revised a bit over time.

The current structure of wetland monitoring on the Flathead Indian Reservation is to evaluate and report on wetland assessment, function, and condition by watershed. As funded, the Wetland Coordinator, a CSKT botanist, and a mapping contractor monitor, assess, and evaluate wetland conditions in a given watershed every other year, building on previous work. Staff revisit five monitoring sites from previous assessment periods and select 15 new wetland sites for vegetation and wetland assessment surveys in the watershed. Selected wetlands represent the full range of human disturbance, ownership, and wetland types found in the watershed, including compensatory mitigation sites when present. There are multiple steps to select sites, leading to a stratified sampling of the watershed.

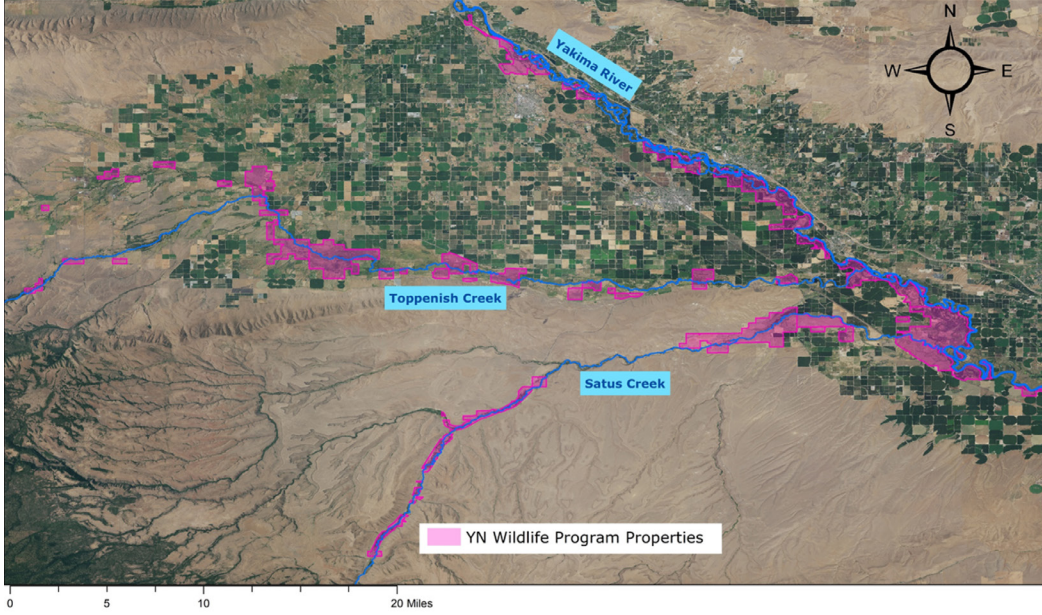
Wetland assessment and monitoring components include:

- **Plant communities.** A complete floristic list and percent cover by species will be recorded for each wetland site for determining vegetation metrics.
- **Wetland classification.** Wetland classes will be determined using both the hydrogeomorphic classification and Cowardin National Wetland Inventory classification systems.
- **Wetland function.** The Montana Department of Transportation's Rapid Assessment Method (2008) will be used to evaluate wetland functions. Rapid assessments evaluate the general condition of wetlands using observable field indicators and are useful when funding, time, or staff is not available for intensive monitoring

There are seven watersheds on the Flathead Reservation. At present, five of them have been assessed and monitored twice, allowing for limited trend analyses by comparing baseline data to current data. Completing watershed-based assessments on the two remaining watersheds will allow CSKT to analyze the data for each of the seven sub-basins and begin documenting changes over time on a larger scale. This effort was funded by an EPA Region 8 WPDG and began in fiscal year 2022. Upon project completion, CSKT's dataset will be more complete and allow for trend analysis in all seven watersheds before setting goals and implementation strategies for wetland conservation into the future.

Key Takeaways

- Don't get discouraged by ups and downs.
- Hire staff with grant-writing skills.



Yakama Nation Wildlife Program managed properties. Photo courtesy of Yakama Nation.

CATEGORIES:

Wetland restoration

Tribal land management

Traditional resource use

Location: The valley bottom portion of the Yakama Nation's Reservation is adjacent to the Yakima River and Satus and Toppenish Creeks, in south-central Washington state.

Size of Tribal Lands/Reservation Acreage: 1,371,918 acres, not including traditional territories outside the reservation.

Population: ~10,000 enrolled members

Size of Wetlands: 4,530 acres of valley bottom National Wetland Inventory wetlands under tribal management; several thousand more acres under federal and private management and under tribal management in the reservation's Closed Area.

EPA Region: 10

Wetland Program Plan (WPP) Status: WPP developed for 2014–2018, currently outdated

Tribal Website: https://www.yakama.com/

Case Author: Bridger Cohan, wildlife program wetlands restoration biologist

Confederated Tribes and Bands of the Yakama Nation | Lower Yakima Valley Riparian Wetlands Restoration Project

The Confederated Tribes and Bands of the Yakama Nation are reclaiming stewardship of valuable wetland and floodplain habitats on their reservation through acquisition, restoration, active management, and monitoring.

The Yakama People have, since time immemorial, used wetlands and floodplain areas for hunting and for gathering many culturally important species. Flooding from dams and conversion to agriculture destroyed many wetlands on the Nation's reservation and ceded territories following European colonization. However, starting in 1991, the Nation entered into a series of agreements with the Bonneville Power Administration to "fund activities on the Yakama Indian Reservation that are necessary to partially mitigate wildlife and wildlife habitats adversely affected by the construction of Bonneville, The Dalles, John Day, and McNary Dams and their reservoirs." This Lower Yakima Valley Riparian Wetlands Restoration Project has enabled tribal management of wetlands and floodplains with the reservation boundary, as well as the implementation of many innovative wetland restoration projects. Specifically, the project pursues four main goals:

1. To permanently protect 27,000 acres of floodplain lands along the Yakima River, Toppenish Creek, and Satus Creek within the agricultural portion of the Yakama Reservation.
2. To enhance those lands to realize a net increase in native fish and wildlife habitat values.
3. To adaptively manage those lands to ensure permanent fish and wildlife value.
4. To monitor the habitat conditions to ensure the desired habitat value is reached and maintained.

To date, the project—administered by the Yakama Nation Wildlife, Range, and Vegetation Resources Management Program—has acquired 21,630 acres of habitat and manages those lands according to tribal priorities and values. Some were relatively intact wetlands, grassland, or shrub-steppe that had passed into private

ownership under the Allotment Act, while others were purchased as agricultural fields and restored. These lands now provide valuable wildlife habitat; offer opportunities for tribal members to gather tule reeds (*Schoenoplectus acutus and S. tabernaemontani*), wapato (*Sagittaria latifolia*), and other important plants; and are a central part of a tribally managed hunting season.

Project lands also provide opportunities for projects that improve the health of local watersheds, such as side channel reconnection efforts or using managed wetlands to trap and clean agricultural runoff. An example of the former project type was partially implemented in 2019, creating inlet structures that will funnel water from the Yakima River into a disconnected side channel that is scheduled for restoration as part of future work. Another upcoming project will use water from the North Drain, an agricultural wasteway with poor water quality, to supplement over 900 acres of managed wetlands at the mouth of Satus Creek. This work will not only improve habitat for migrating waterfowl, but also keep sediment, nutrients, and other agricultural pollutants out of Satus Creek, which hosts an important run of Endangered Species Act–listed Middle-Columbia steelhead (*Oncorhynchus mykiss*).

Through targeted land acquisition and management, as well as specific restoration projects, the Yakama Nation has improved tribe members' opportunities to exercise traditional hunting and gathering practices on their reservation. The project has also enabled the Yakama Nation to manage wildlife populations and hunting on the reservation without state interference, preserving tribal sovereignty. Project staff contribute to environmental decision-making in the Yakima basin more broadly as well, helping the Yakima Nation to advocate for its interests in its ceded territories, in addition to protecting critical habitats on the reservation.

Key Takeaways

- Sovereignty and control of land is key to true tribal management.
- Small-scale but targeted restoration can have a large impact on the landscape.
- Be clear-eyed about working within current watershed and landscape conditions, but with the goal of maximizing benefits to native species and traditional cultural practices.

Additional Resources

An older but still informative look at project restoration, with videos: https://yakamafish-nsn.gov/restore/projects/xapnish

The former Wetland Program Plan: https://www.epa.gov/sites/default/files/2019-03/documents/yn_draft_wetland_program_plan_9-30-13.pdf

A spruce bog on the Fond du Lac Reservation. Photo courtesy of Rick Gitar.

CATEGORIES:

Water quality standards for wetlands

Location: The Fond du Lac Reservation, which was established in 1854 by treaty with the U.S. government and to which the U.S. government has a trust responsibility, is situated in northeastern Minnesota, adjacent to the city of Cloquet. The reservation is located about 20 miles west of Lake Superior and the city of Duluth.

Size of Tribal Lands/Reservation Acreage: 101,000 acres

Population: ~4,300 enrolled members

Size of Wetlands: The Fond du Lac Reservation contains 4,662 individual wetland entities based on the Cowardin Classification System; wetlands total 43,873 acres and 43.4% of the reservation land area.

EPA Region: 5

Wetland Program Plan (WPP) Status: WPP developed under a Wetland Program Development Grant for 2019–2023, incorporating four of four core elements, following development of EPA-approved water quality standards (available here)

Tribal Website: https://www.fdlrez.com/

Case Author: Richard Gitar, Water Regulatory Specialist/Tribal Inspector, Fond du Lac Office of Water Protection

Fond du Lac Band of Lake Superior Chippewa | Development of Wetland Water Quality Standards

In preparation for Fond du Lac's triennial review of their water quality standards (WQS), the Wetland Program developed narrative wetland WQS.

The Wetland Program primarily used EPA's template tool (available here) to develop the narrative standards. In addition to wetlands becoming a designated use of the WQS, the template aided in preparing language for using wetland functions as wetland designated uses. This was then combined with the standard "free from" language to complete the narrative standards.

Key Takeaway

It was important to Fond du Lac to include wetlands in their standards because nearly all of the Clean Water Act (CWA) section 401 water quality certifications granted on the reservation have involved wetland impacts from U.S. Army Corps of Engineers permits. Creating wetland WQS has allowed Fond du Lac to include these standards as part of the CWA section 401 water quality certifications and include conditions specific to the protection of wetland designated uses.

Additional Resources

Fond du Lac's WQS are available here. Chapter 7, page 34, contains the wetland standards language.

White turtlehead (*Chelone glabra*), a medicinal plant. Photo courtesy of Rick Gitar.

CATEGORIES:

Traditional Ecological Knowledge/ cultural uses of wetlands

Location: The Fond du Lac Reservation, which was established in 1854 by treaty with the U.S. government and to which the U.S. government has a trust responsibility, is situated in northeastern Minnesota, adjacent to the city of Cloquet. The reservation is located about 20 miles west of Lake Superior and the city of Duluth.

Size of Tribal Lands/Reservation Acreage: 101,000 acres

Population: ~4,300 enrolled members

Size of Wetlands: The Fond du Lac Reservation contains 4,662 individual wetland entities based on the Cowardin Classification System; wetlands total 43,873 acres and 43.4% of the reservation land area.

EPA Region: 5

Wetland Program Plan (WPP) Status: WPP developed under a Wetland Program Development Grant for 2019–2023, incorporating four of four core elements, following development of EPA-approved water quality standards (available here)

Tribal Website: https://www.fdlrez.com/

Case Author: Richard Gitar, Water Regulatory Specialist/Tribal Inspector, Fond du Lac Office of Water Protection

Fond du Lac Band of Lake Superior Chippewa | Wildcrafting Guide and Medicinal Plant List

Several members of the Fond du Lac Environmental Program, including the Environmental Education Coordinator, Wetland Specialist, and Water Regulatory Specialist, developed the Wildcrafting Guide and Medicinal Plant List, available here, for use in various classes with students.

Since created, the list has been used for several classes on medicinal plants sponsored by Fond du Lac's 13 Moons Program, which is designed to bring the Ojibway Culture back to its people through hands-on learning.

This effort began as a list of plants encountered during a medicinal plant walk conducted by Rick Gitar, Water Regulatory Specialist, in the summer of 2014. Later, others added plants to the list that they were either familiar with or had used medicinally themselves. This was often done as part of several additional medicinal plant walks taken with students (both youth and adults) who were willing to share their knowledge of medicinal plants while on these walks. The idea was to provide interested Band members with a guide and plant list of local medicinal plants they could use without having to fumble through a larger plant book with unrelated species or plants that were not in the area.

The plant list is centered on plants found in northeast Minnesota and northwest Wisconsin. However, nearly all of the species on the list have a much larger range and can be found in many other states as well.

Key Takeaway

The process of creating the Wildcrafting Guide and Medicinal Plant List—as well as the list itself—served to engage Band members, lifting up the Ojibway Culture through learning and doing, and created a locally and culturally specific plant reference book that will continue to serve Band members.

Additional Resources

Wildcrafting Guide and Medicinal Plant List, available here.

High-altitude spring in White Ruin Canyon. Photo courtesy of Jim Duffield.

CATEGORIES:

Assessment

Water quality standards for wetlands

Wetland Program Plan development

Location: The Hopi Reservation in northeast Arizona lies in the Little Colorado Watershed, the Dinnebito Wash, and the Moenkopi Wash.

Size of Tribal Lands/Reservation Acreage: ~1.6 million acres

Population: ~14,041 tribal members

EPA Region: 9

Wetland Program Plan (WPP) Status: WPP developed under a Wetland Program Development Grant for 2015–2019, incorporating four of four core elements (available here)

Tribal Website: https://www.hopi-nsn.gov/

Case Author: Jim Duffield (retired), hydrogeologist, Hopi Tribe Water Resources Program

Hopi Tribe | Wetland Program Development

In FY 2012 the Hopi Water Resources Program (WRP) applied for and received a grant under section 104(b)(3) of the Clean Water Act. The WRP created a Wetland Program Plan (WPP) by addressing the components of the Core Elements Framework (CEF) and applying them to the unique culture and waters of the Hopi lands.

The CEF consists of four elements: Monitoring and Assessment, Regulatory Activities, Voluntary Restoration and Protection, and WQS for Wetlands.

WRP focused first on Monitoring and Assessment, developing a monitoring design from data review, a wetland inventory, and a classification system of Hopi wetlands. WRP selected core indicators that represented wetland health/condition, and a wetlands bioassessment quality assurance project plan was created to standardize new monitoring techniques. Tribal employees were trained in field methods to monitor indicators and increase the scientific capability of Hopi WRP. The tribe used these data to address the second section of the CEF, Regulatory Activities, and design a comprehensive jurisdictional range for the Tribal Wetland Program.

Goals for the third element of the CEF, Voluntary Restoration and Protection, were set with the input of other tribal programs such as Wildlife and Ecosystems and the Range Program. By providing guidance on management techniques and restoration methods within a watershed context, the tribe was able to standardize methods and more easily compare results in Hopi restoration and protection goals Reservation-wide.

Using outputs from the first three elements, WRP created a set of WQS for wetlands, addressing the fourth core element. These standards included the adoption of a definition of "wetlands" and their delineation on lands within Hopi jurisdiction.

The Hopi Tribe WPP included five key points:

1. An overall goal statement for the program over the time period covered by the WPP.
2. An overall timeframe for the WPP.
3. A list of planned actions consistent with the CEF for the program to carry out over the WPP's timeframe.
4. A schedule for the achievement of each action.
5. A list of more specific activities to be accomplished under each action.

Key Takeaway

Interfacing with the U.S. Environmental Protection Agency and understanding the guidance for developing a WPP, and how it fits in with the particular context of your tribe and the wetlands your tribe is protecting and managing, is essential.

The Nez Perce Tribe's Musselshell Meadows, a culturally important camas (Camassia quamash ssp. quamash) harvesting wetland. The Nez Perce's name for camas is q'emes. Photo courtesy of Rue Hewett Hoover.

CATEGORIES:

Assessment

Traditional Ecological Knowledge/ cultural uses of wetlands

Location: The Nez Perce Reservation is located in the Columbia Snake River Plateau east of Lewiston, Idaho.

Size of Tribal Lands/Reservation Acreage: The current Nez Perce Reservation encompasses 770,470 acres, with tribal lands having originally occupied a vast territory of approximately 13 million acres in the present-day states of Idaho, Oregon, and Washington.

Population: ~3,510 enrolled members

Size of Wetlands: More than 300 wetlands. Many are small, with over a third less than 1.25 acres. The majority are classified as palustrine emergent wetlands according to the Cowardin classification and as riverine according to the hydrogeomorphic classification.

EPA Region: 10

Wetland Program Plan (WPP) Status: WPP developed under a Wetland Program Development Grant for 2020–2025, incorporating four of four core elements (available here)

Tribal Website: https://nezperce.org/

Case Author: Rue Hewett Hoover, water resources, wetland specialist, Nez Perce Tribe

Nez Perce Tribe | Wetland Ecosystem Services Protocol Tool

The Nez Perce Tribe Wetlands Program has adapted a functional assessment tool, the Wetland Ecosystem Services Protocol (WESP), created by Dr. Paul Adamus, for tribal use on the Nez Perce Reservation.

This tool will be used to determine the functions and values (both ecological and cultural) of reservation wetlands to make decisions and prioritize actions in the tribe's approach to future wetland management.

WESP-NP addresses 17 specific functions, not all of which are applicable in each individual wetland:

- Water storage and delay (WS)
- Thermoregulation (SFT)
- Sediment retention and stabilization (SR)
- Phosphorus retention (PR)
- Nitrate removal and retention (NR)
- Carbon sequestration (CS)
- Organic nutrient export (OE)
- Aquatic invertebrate habitat (INV)
- Fish habitat (FA)
- Amphibian and reptile habitat (AM)
- Waterbird habitat (WB)
- Songbird, raptor, and mammal habitat (SBM)
- Pollinator habitat (POL)
- Native plant diversity (PD)
- Cultural significance (CRI)*
- Wetland sensitivity (Sens)
- Wetland stress (STR)

It is anticipated that this tool will have several uses for the Tribe's Natural Resource divisions and other tribes and agencies in the region as a tool for identifying functions, benefits, and values of individual wetlands; prioritizing wetlands restoration and protection; evaluating restoration results; monitoring the long-term effects of wetland restoration; predicting and evaluating impacts from

* In addition to adapting and calibrating this model to the Nez Perce ecosystems (Reservation and Ceded Lands), a cultural importance function was added, which has never been included before.

changing rainfall and weather patterns to assist in adaptation to hazards, floods, and droughts due to climate change; and incorporating cultural value into the evaluation of wetlands.

The Nez Perce Tribe Wetlands Program staff have worked with Dr. Paul Adamus to adapt the tool for use on the reservation and add a cultural component using the tribe's Traditional Ecological Knowledge.

With this tool, the Wetlands Program has started prioritizing wetland restoration projects with other tribal departments.

Incorporating the cultural component into the tool will raise the rated value of each wetland based on cultural importance. This functional assessment tool, which incorporates ecological and cultural attributes, was something the tribe was lacking and needed to assess wetlands. It will be helpful to apply as guidance in Nez Perce tribal programs to help them design and evaluate future restoration projects.

Key Takeaways

- WESP-NP provides a science-based, landscape-level view of a wetland's various ecological services. All wetlands are important, but not all are equal—functional assessment (FA) enables distinction between wetlands on a functional basis, based on both the effectiveness and value of each function.
- FA results can be used as a decision-making tool for regulators in wetland regulatory approval processes, as well as for proponents in project planning and design.
- WESP-NP is a tool for determining compensation requirements for wetland alterations and also for evaluating wetland restoration success.
- The field component of WESP-NP is quite rapid and efficiently executed.
- Repeatability, or consistency, of scores using WESP-NP has been found to be within ± 0.6 points or less on a 0 to 10 scoring scale.
- Numeric scores facilitate inter-wetland comparison, ecological ranking of wetlands, and change over time analysis (i.e., pre- and post-alteration or restoration/enhancement).
- Results can be analyzed in individual functions (e.g., nitrate removal) or grouped functions (e.g., terrestrial support)

Additional Resources

Adamus, P.R. 1983. A Method for Wetland Functional Assessment. Volume II: Methodology. FHWA-IP-82-24. Federal Highway Administration.

Adamus, P.R., E.J. Clairain, R.D. Smith, and R.E. Young. 1987. Wetland Evaluation Technique (WET). Volume II: Methodology. US USACE.

Adamus, P.R., E.J. Clairain, Jr., D.R. Smith, and R.E. Young. 1992. Wetland Evaluation Technique (WET). Volume I: Literature Review and Evaluation Rationale. USACE.

Adamus, P.R., T.J. Danielson, and A. Gonyaw. 2001. Indicators for Monitoring Biological Integrity of Inland Freshwater Wetlands: A Survey of North American Technical Literature (1990–2000). EPA843-R-01-Fall 2001. U.S. Environmental Protection Agency EPA). https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P1007Z4S.txt.

Adamus, P., and K. Verble. 2020. Manual for the Oregon Rapid Wetland Assessment Protocol (ORWAP, Revised): Version 3.2. Oregon Department of State Lands. https://www.oregon.gov/dsl/WW/Pages/ORWAP.aspx.

Adamus, P., K. Verble, and L. McCallister. 2020. Oregon Rapid Wetland Assessment Protocol (ORWAP, Revised): Version 3.2 Calculator Spreadsheet, Databases, and Data Forms. Oregon Department of State Lands. https://www.oregon.gov/dsl/WW/Pages/ORWAP.aspx.

Adamus, P.R. 2013. Wetland Ecosystem Services Protocol for Southern Alberta: Calculator Spreadsheet and Manual. Alberta Environment and Sustainable Resource Development.

The Wallooskee-Youngs Restoration Project site, sponsored by the Cowlitz Tribe. Photo courtesy of Snoqualmie Tribe (Matt Baerwalde).

CATEGORIES:

Education

Intertribal cooperation

Partnerships with federal or state agencies, academic institutions, or others

Wetland program plan development

Location: Tribal lands across the Pacific Northwest region

Participating Tribes: Over 40 different tribes, native villages, and tribal organizations have participated in the PNW TWIG.

EPA Region: 10

Wetland Program Plan (WPP) Status: Tribal WPPs submitted to and approved by EPA can be found on EPA's website, here, in the Region 10 section.

TWIG Website: https://pnwtwig.wordpress.com/

Case Author: Matt Baerwalde, Snoqualmie Indian Tribe, former TWIG Lead and current Steering Committee member

Pacific Northwest Tribal Wetlands Working Group | PNW TWIG

The Pacific Northwest (PNW) Tribal Wetlands Working Group (TWIG) is a group of Native American tribes that have common interests in wetlands and aquatic resources.

Since 2010, the PNW TWIG has met at workshops or trainings about twice per year to share wetland and aquatic resource restoration and monitoring techniques, tribal approaches, and learn from one another on reservations across the Northwest. These workshops and trainings are open to PNW tribes and are aimed at improving Wetland Program Plans and the condition of wetlands in the region.

Self-governance, tribal heritage, and cultural identity are directly dependent upon water quality and associated traditional resources, which for many tribes was guaranteed by treaty. However, the geographic isolation of tribal wetland and aquatic resource management professionals hampers the cohesiveness of an important professional support network.

The TWIG started with a conversation in 2009 at an Environmental Protection Agency (EPA) training and the discovery that tribal staff wanted to meet more regularly to talk more about WPPs. In 2010, Scott O'Daniel from the Confederated Tribes of the Umatilla Indian Reservation stepped in as the first TWIG lead; that position has since passed to Matt Baerwalde from the Snoqualmie Indian Tribe (in 2017) and now to Kelsey Payne (2021), also from the Snoqualmie Tribe.

The TWIG is guided by the TWIG lead and the TWIG Steering Committee, which was designed to be small in order to increase efficiency and responsiveness and to represent the diversity of tribes active in the group. The Steering Committee is open to any interested TWIG participant, and the TWIG aims to refresh committee membership while retaining institutional knowledge. The volunteer structure of the TWIG relies on intertribal partnerships to guide the completion of the workplans outlined in the EPA grant agreements that support the group's activities. Over the past decade, the TWIG has built many partnerships necessary to hold each workshop and training event and guide the group's work.

TWIG programming is reflective of tribes' needs and current challenges. Training topics are decided by polling participating tribes; content for workshops is organized and presented by the hosting tribes, according to the issues they are working on, along with their collaborators and with support from the TWIG lead. Examples of themes from past workshops included the role of wetlands in stream temperature regulation, climate change influence on high meadows, urban encroachment on floodplain wetlands, and incorporating tribal values into rapid assessment methods.

For over ten years, the PNW TWIG has facilitated collaborative, science-based decision-making while encouraging peer relationships and creating opportunities that facilitate natural resource management policies and methods consistent with tribal values. Tribal WPPs are locally developed efforts, centered on a particular tribal community's traditional patterns of using wetlands and aquatic resources. Outcomes of TWIG's efforts have contributed to a significant increase in the number of tribes creating WPPs and increased collaboration between EPA and the PNW tribes.

Key Takeaways

- The TWIG supports EPA Region 10 tribes (which includes 271 tribes in Alaska, Idaho, Oregon, and Washington in protecting wetlands and aquatic resources by sharing knowledge and expertise, in large part through collaboratively designing and hosting meaningful workshops and trainings that help tribal staff learn, grow, and share.
- Tribal wetlands and aquatic resources staff have found value in the TWIG as a venue for information sharing and transfer of technical expertise regarding restoration, protection, and management strategies for wetlands and aquatic resources, from a tribal perspective.
- The TWIG works to support ongoing development and implementation of tribal wetland and aquatic resource monitoring strategies, and increased awareness of the cultural importance of wetlands and aquatic resources, through regular outreach to regional tribes and working in collaboration with EPA Region 10 wetlands staff.

Additional Resources

PNW TWIG website: https://pnwtwig.wordpress.com/

SSpring 2021 WPP training recordings:

- Part 1: https://youtu.be/7Z77wUgtI0o
- Part 2: https://youtu.be/Tyx_LbYMhHE

A small drainage (i.e., input) that flows from the north into the larger Prairie Band wetland restoration project. Vegetation shown includes reed canary grass (*Phalaris arundinacea*), black willow (*Salix nigra*), and bush false indigo (*Amorpha fruticosa*). Photo courtesy of Frank Norman.

CATEGORIES:

- Assessment
- Education
- Grant-supported projects
- Mapping, inventory
- Partnerships with federal or state agencies, academic institutions, or others
- Regulatory programs
- Restoration, including voluntary restoration
- Traditional Ecological Knowledge/ cultural uses of wetlands

Location: Northeast region of the state of Kansas

Size of Tribal Lands/Reservation Acreage: ~77,440 acres

Population: ~5,000 enrolled members

Size of Wetlands: Over 120 acres of wetlands and nearly 2,000 acres of potential wetland restoration areas exist within the exterior boundary of the Prairie Band Potawatomi Reservation.

EPA Region: 7

Prairie Band Potawatomi Nation | Wetland Reserve Easement Project

The Prairie Band Potawatomi Nation and the Natural Resources Conservation Service (NRCS) commemorated the approval of an Agricultural Conservation Easement Program–Wetland Reserve Easement (ACEP-WRE) contract on Monday, December 17, 2018, in an event held at the Prairie Band Casino & Resort.

The contract approval marked a momentous event in Kansas as the first tribal wetland long-term contract established in Kansas, and one of only a handful throughout the United States. The Prairie Band Potawatomi Nation entered into a 30-year contract with NRCS to restore the functions and values of an existing wetland located on the Prairie Band Potawatomi Reservation. The Nation learned about the ACEP-WRE program opportunity through involvement in watershed restoration and protection strategies with local agencies, county extension, and others. Being involved with local stakeholders in meetings, at conferences, and through networking has led to many partnerships over the years.

The wetland restoration area consists of 31.7 acres. The project was initiated in 1996 under the direction of the Prairie Band Potawatomi Nation Planning and Environmental Protection department according to the department's director, Virginia LeClere. Over the course of many years, and many staff contributing to the project, it became a reality.

The site consisted of many types of wetland plants and appropriate hydrology present, but the one significant determining factor in selecting the site was that a majority of the land was not in production and had lain fallow for years. The wetland restoration site will serve multiple purposes, such as flood control, increased habitat, educational opportunities, and recreational and cultural uses.

The primary objectives of this project are to restore and enhance wetland wildlife habitat and improve the overall water quality for the contract area. The Prairie Band Potawatomi Nation aspires to restore the values and functions of the degraded wetland by restoring hydrology and enhancing the wetland and

Wetland Program Plan (WPP) Status: First WPP approved by Tribal Council in January 2015, for 2015–2018; plan developed under a Wetland Program Development Grant for 2019–2023, incorporating four of four core elements (available here)

Tribal Website: https://www.pbpindiantribe.com/

Case Author: Verna Potts, Senior Environmental Technician, Prairie Band Potawatomi Nation

adjacent upland buffer area for pollinators. This wetland restoration helps the Nation meet its overall conservation goals by meeting a set of objectives:

1. To establish a net gain wetland policy and a no destruction of wetlands policy for tribally owned lands.
2. To integrate wetlands management with other resources issues on a watershed basis.
3. To access, characterize, and identify wetland within the reservation, including past, present, and potential wetlands.
4. To develop a classification system and water quality standards to protect wetlands functions and values.
5. To provide technical assistance and other incentives to landowners implementing management practices that conserve, enhance, and restore wetlands on private property.

This area will also be used for educational outreach and provide opportunities for hunting, trapping, and recreational bird watching. A walking path will be established for visitors to reach the center area of the wetlands in order to observe the natural wildlife in their restored habitat.

The WRE program has provided the Nation with the opportunity to enroll acres into their program to restore marginal agricultural lands. A financial incentive is allocated based on criteria set forth by the U.S. Department of Agriculture. And through the tribe's partnership with their local NRCS agency, a wetland management plan was also provided to the Nation for this site. This will assist the Tribe in future maintenance and planning for potential enrollment of other wetlands. The primary goal of this effort is conservation and net gains of wetlands on the Prairie Band Potawatomi Nation's reservation.

A very important component of protection and sustainability of tribal natural resources is listening and learning from tribal elders. Valued Traditional Ecological Knowledge is not taught by way of a book or an educational institution; it is learned by taking the time to visit and listen to the elders and incorporating that knowledge into developing and practicing sound management decisions for our limited natural resources. Elders will honor and respect water in our ceremonies and pass on this wisdom. Wetlands have been instrumental in the survival of our people. For instance, during the age of war and relocation, Indigenous people would seek shelter in places like wetlands to survive. Wetland plants and animals also provide food and medicines that are only located in wet habitats. Wetland protection and restoration are key to ensuring that future generations benefit from this precious resource.

The WRE project ensures the wetland will remain in conservation for a term of 30 years. This measure was taken to prevent wetland losses and degradation. This site will be monitored and assessed every five years to gauge the effectiveness of the restoration project. And the Nation will showcase this site to encourage other agricultural and landowners to appreciate the benefits of wetlands.

"The Prairie Band Potawatomi Nation is thankful for the opportunity to return this portion of land back to its natural wetland condition and for the area's high potential to provide environmental education. We look forward to having our youth and the community visit the site and experience direct learning about the unique attributes a wetland provides for water resources and the environment," said Joseph Rupnick, Prairie Band Potawatomi Nation Chairman.

Key Takeaway

Under Clean Water Act section 319, U.S. Environmental Protection Agency (EPA) funds activities to protect and/or restore wetlands for nonpoint source water quality improvement, and EPA encourages such dual-purpose, wetland/water quality improvement activities. Strategic planning, by way of integration of water programs goals, objectives, and developing a comprehensive planning process, is a key component of our wetlands and section 319 programs. Collaboration and partnership are very essential to building a network of shared goals. Developing and fostering partnership among states, tribes, community, and others has enabled the Prairie Band Potawatomi Nation's water programs to advance and implement wetland restoration and enhancement.

The Pyramid of Pyramid Lake. Photo courtesy of Robyn Mercer.

CATEGORIES:

Education

Traditional Ecological Knowledge/ cultural uses of wetlands

Location: The Pyramid Lake Indian Reservation is located 35 miles northeast of Reno, Nevada, in a remote desert area in the counties of Washoe, Lyon, and Storey.

Size of Tribal Lands/Reservation Acreage: ~477,000 acres

Population: ~2,300 enrolled members

Size of Wetlands: The Wetlands Program has monitored 22 wetlands since the early 2000s and has recently added new sites that were inventoried in 2021, coming to a total of 36 wetlands. The majority of these wetlands are small in size and characterized as riverine, slope, or depressional.

EPA Region: 9

Wetland Program Plan (WPP) Status: WPP developed under a Wetland Program Development Grant for 2015–2018, incorporating three of four core elements; the plan was then updated for 2018–2021, and the program is currently updating and revising the plan for 2022–2025

Tribal Website: https://plpt.nsn.us/

Case Author: Robyn Mercer, wetlands specialist

Pyramid Lake Paiute Tribe | Improvements to Education and Outreach

The Pyramid Lake Paiute Tribe is located about 35 miles northeast of Reno, Nevada. The reservation encompasses the entirety of Pyramid Lake, which is a desert-terminal lake that sits at the bottom of the Lake Tahoe and Truckee River Watersheds. The Wetlands Program is funded entirely through a Wetland Program Development Grant (WPDG). The program adds a new project through each new grant cycle, while also continuing annual work through other components. The tribe's most recent WPDG, which ended September 30, 2021, contained one new component focused on developing a wetlands story map through ArcGIS. The Wetlands Program needed new and innovative ways to reach the community; this is crucial in gaining support for program work, and in spreading information about wetlands, their history and cultural uses on the reservation and the program. The tribe's Wetlands Program work has also consisted of larger projects that used community outreach events.

Vital to the Pyramid Lake Paiute Tribe's Wetlands Program is the continued and expanded work being done in education and outreach. Building an education and outreach component into the Wetland Program Plan was essential in gaining community support and has improved the Wetlands Program in several ways Education and outreach are useful for sharing information and getting tribe members, as well as outside community members, involved in this work.

Education and outreach components that have been incorporated into the tribe's program, through the WPDG, include:

- Development of the water quality website, which houses the Wetlands Program information page.
- Visits to local schools to give presentations and conduct activities.
- Partnering with the Project WET (national water education program)
- Volunteer and outreach events (typically for restoration activities at a wetland, as well as seed collection events).

- Using the Pyramid Lake Museum for outreach and information sharing.
- Conducting the Annual Youth Camp, a collaborative effort for the tribe's entire Natural Resources Department.
- Developing the tribe's interactive wetlands story map through ArcGIS.

In 2019, the Wetlands Program received funding through a WPDG to develop an interactive story map through the ArcGIS online platform. The Wetlands Program saw a need for additional outreach and education material to reach more people on a user-friendly platform. The website needed major updates, but overall was not sufficient for the amount of information the program desired to share. The ArcGIS story map platform is interactive, can be used on any device, and is user-friendly. Through the development process, the Wetlands Program collected historical documents, gathered cultural resources and materials, and determined the deliverables and outcomes for the story map itself. The tribe wanted the story map to be an educational, interactive public outreach tool that includes the Paiute culture and history.

With the education and outreach materials and efforts, the Wetlands Program has seen growth in community support for the program. In addition to sharing information, the program holds outreach and volunteer events, which typically involve restoration activities; these events have significantly helped in getting large projects finished and allow participants to see first-hand the work the Wetlands Program is doing.

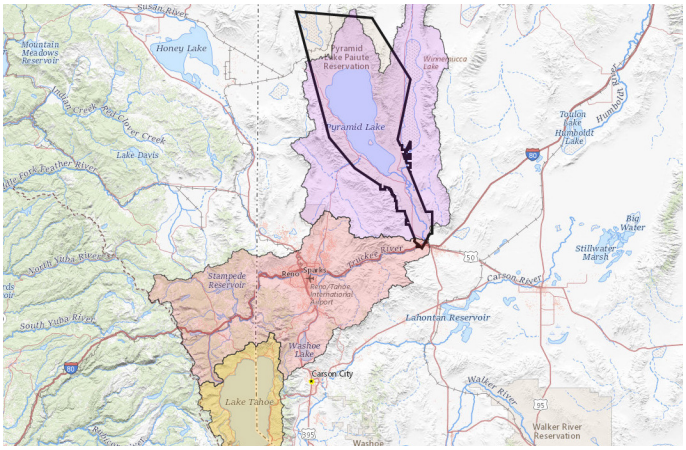
Key Takeaways

- Education and outreach can help gain support for your wetlands program and current and future work.
- Education and outreach can be achieved through many different activities.
- Sharing your experiences through innovative outreach platforms can not only increase community knowledge, but also be useful resources for other scientists/programs/tribes/etc.
- To utilize ArcGIS story maps, you do not need to be an advanced user of ArcGIS. Basic knowledge of ArcGIS is sufficient, and if you have no experience in ArcGIS, it is still possible to create a usable and efficient story map.

Additional Resources

The Pyramid Lake Paiute Tribe's Wetlands story map shares general information of wetlands, details the Wetlands Program and its work, shares historical and cultural aspects of wetlands on the Pyramid Lake Indian Reservation, and shares public outreach past and future events to get the community involved. The story map is interactive and gives the user a unique experience when reading through the page. The link for the story map can be found here.

In addition to the story map, the Pyramid Lake Water Quality Program (which houses the wetlands program) has its own website. Here, various projects and information about water quality can be found, as well as additional information on the Wetlands Program, including a link to the story map. This website can be found here.



Pyramid Lake Paiute Tribe watershed boundaries map. Courtesy of Robyn Mercer

Aerial photograph of Zagime (Mosquito), one of many shallow open-water wetlands within the Red Lake Indian Reservation. Photo courtesy of Red Lake DNR Water Resources Program.

CATEGORIES:

Assessment

Grant-supported projects

Mapping, inventory

Partnerships with federal or state agencies, academic institutions, or others

Location: The Red Lake Reservation is located across nine northern Minnesota counties. The reservation encompasses Lower Red Lake and a major portion of Upper Red Lake. Lower Red Lake is the largest Minnesota lake fully within its borders. The Red Lakes and surrounding wetlands are situated at the headwaters of the Red Lake River, which flows from the east and discharges west into the Red River in Grand Forks, North Dakota.

Size of Tribal Lands/Reservation Acreage: More than 835,000 acres

Population: ~10,000 members

Size of Wetlands: ~541,000 acres, classified into six types: shallow open-water, emergent, wet meadows, scrub-shrub, forested, and various combinations of the five mentioned

EPA Region: 5

Wetland Program Plan (WPP) Status: WPP developed under a Wetland Program Development Grant for 2016–2020, incorporating four of four core elements (available here)

Red Lake Band of Chippewa Indians | Wetland Mapping Within the Red Lake Indian Reservation

The Red Lake Indian Reservation is located in north central Minnesota. Before 2016, the tribe was relying on wetland maps (from the National Wetland Inventory or NWI) produced by the United States Fish and Wildlife Service (USFWS) dating back to the 1980s.

The tribe felt that it was in its best interest to update the NWI for the contiguous portion of the reservation to determine if wetland extent has increased or decreased over time.

The Red Lake Water Resources Program put together a WPDG in order to conduct the task within the WPP. Within the Plan, the Water Resources Program had stated the desire to update the NWI for the contiguous portion of the reservation and develop a shoreline ordinance guideline to be followed during construction practices.

In 2016, the Red Lake Water Resources Program submitted a WPDG proposal and was awarded the grant to fulfill this wetland mapping database and shoreline ordinance. Once funds became available in 2017, the Water Resources Program collaborated with the Red Lake Forestry Department to obtain land cover layers from timber cruises and logging cuts and the USFWS to develop a methodology that would highlight hydric soils using the ArcMap GIS tool.

After months of computer processing and physically digitizing hydric soils, the end result was an updated NWI layer that the Red Lake Water Resources Program could use to help inform the tribe and the Planning Department of where wetlands are located. This new NWI layer was also used to help develop the shoreline ordinance for new construction practices. The shoreline ordinance is similar to most county construction ordinances, but the Water Resource Program developed more strict guidelines to follow to help ensure that wetlands and bodies of water were given sufficient buffer zones.

Tribal Website:
https://www.redlakenation.org/

Case Author: Tyler Orgon, biologist, Red Lake Band of Chippewa Indians

Key Takeaways

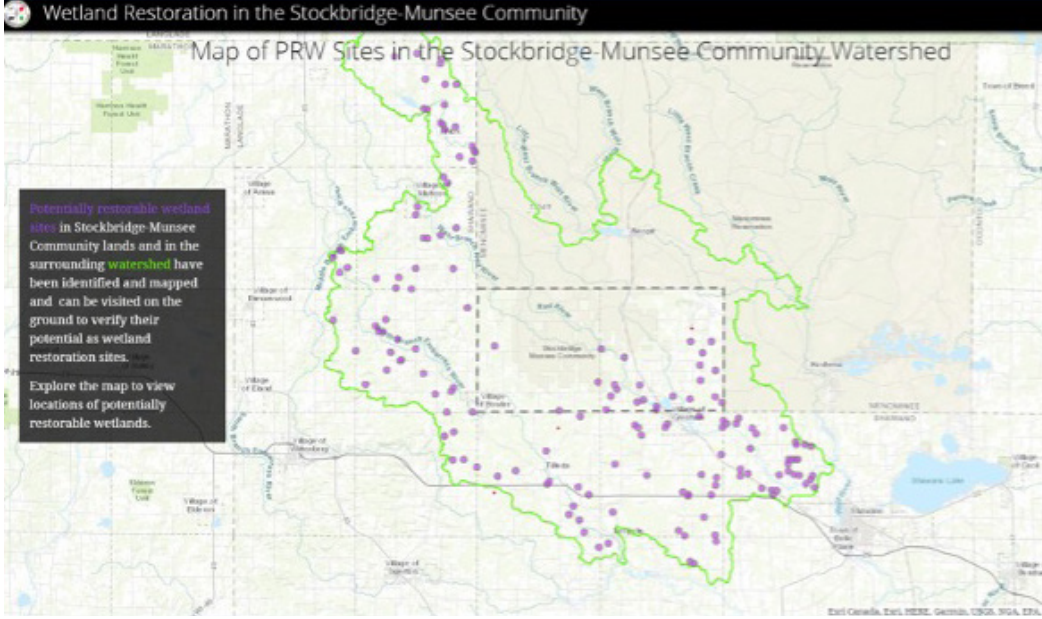
- Depending on the size of your reservation or the area of interest, it would be wise to collaborate with a local university or use a private contractor. This project took approximately a year and half of computer processing, digitizing, and ground-truthing roughly 10% of the identified wetlands for one FTE. Keep in mind that the contiguous portion of Red Lake Indian Reservation is approximately 675,000 acres.
- You need reliably good internet and server speed. Also, you're going to want a computer that has high processing speed and storage if you're not using a local server.
- Lastly, you need to be an intermediate to advanced user of ArcMap to undertake this type of project.

Additional Information and Graphics

Kloiber, S.M., R.D. Macleod, A.J. Smith, J.F. Knight, and B.J. Huberty. 2015. A Semi-Automated, Multi-Source Data Fusion Update of a Wetland Inventory for East-Central Minnesota, USA. Wetlands 35: 335–438. https://doi.org/10.1007/s13157-014-0621-3.

Rampi, L.P., J.F. Knight, and K.C. Pelletier. 2014. Wetland Mapping in the Upper Midwest United States: An Object-Based Approach Integrating Lidar and Imagery Data. Photogrammetric Engineering and Remote Sensing 80(5): 439–449. https://doi.org/10.14358/PERS.80.5.439.

Federal Geographic Data Committee. 2009. Wetland Mapping Standard. FGDC-STD-015-2009. https://www.fgdc.gov.



Example story map, showing an interactive map of potentially restorable wetlands within the Stockbridge-Munsee Community's watershed. Photo courtesy of Stockbridge-Munsee Community.

CATEGORIES:

Education

Grant-supported projects

Partnerships with federal or state agencies, academic institutions, or others

Location: The Stockbridge-Munsee Band of Mohican Indians Reservation is located in Shawano County, Wisconsin. Original tribal lands were on the East Coast in New York and Massachusetts.

Size of Tribal Lands/Reservation Acreage: 25,330 acres

Population: ~1,600 members

Size of Wetlands: 6,500 acres, 26% of land base

EPA Region: 5

Wetland Program Plan (WPP) Status: WPP developed under a Wetland Program Development Grant for 2015–2020, incorporating three of four core elements (available here); updated plan for 2022–2026 in progress.

Tribal Website: https://www.mohican.com/

Case Author: Mike Jones, Stockbridge-Munsee Community Wetland Specialist

Stockbridge-Munsee Community | Story Map Project

The Stockbridge-Munsee Community (SMC) was awarded an EPA Wetland Program Development Grant to improve outreach and education efforts for their Water Resources Programs, particularly within the tribal community.

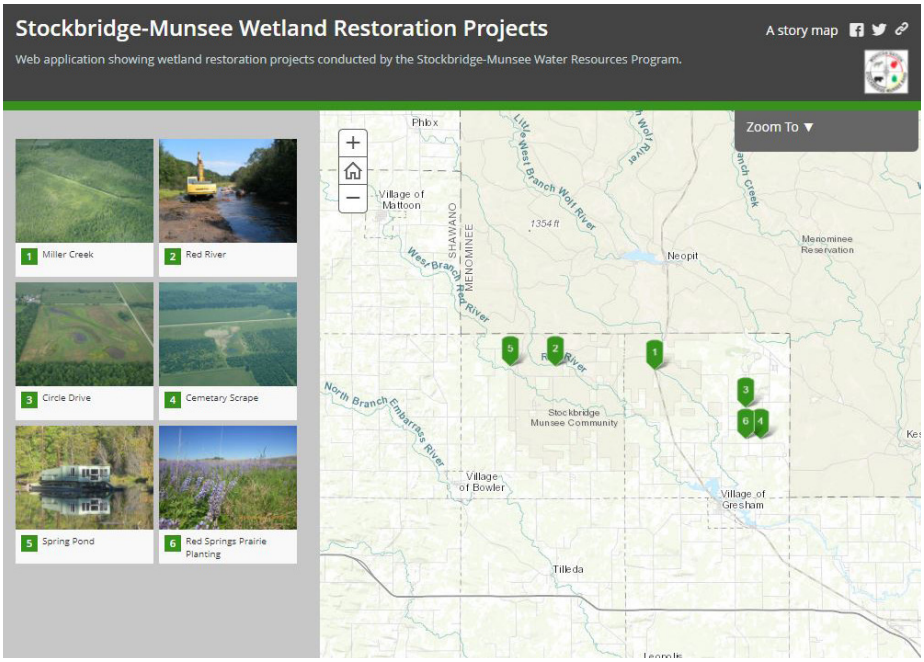
Education and outreach are important components of a successful tribal wetland program, as they help communicate goals, highlight accomplishments, and build community support. The SMC Wetland Program had felt that improvement was needed to better engage with the tribal community and decided to focus on incorporating digital media. To accomplish this, SMC created a website containing a series of ArcGIS story maps that highlighted the efforts of the programs.

Story maps combine maps, narratives, photos, and videos to convey information in an engaging and interactive way. They have become a popular communication tool throughout many different industries. While story maps can be relatively simple to create, SMC contracted St. Mary's University of Minnesota, GeoSpatial Services, to assist with website design and incorporating more advanced features.

The final website included six different story maps:

- SMC history and cultural connection to water.
- Overview of SMC water resources and the Water Resources Programs.
- Summary of the SMC potentially restorable wetland (PRW) mapping project.
- Interactive map of stream quality and PRWs within the watershed.
- Highlights from past water resources projects.
- Overview of the Miller Creek stream and wetland restoration project.

The website also includes links to several SMC management plans and assessment reports for those seeking more in-depth information. The site is currently being updated and expanded to highlight the work of the entire SMC Ecology Department.



Stockbridge-Munsee Community story map introductory page. Photo courtesy of Mike Jones, Stockbridge-Munsee Community.

Key Takeaways

- Using multiple types of media can strengthen education and outreach efforts and help reach a broader audience.
- Story maps provide an interactive and visually appealing means of communicating all aspects of a wetland program. They can work well to complement other outreach media, such as newspaper articles and newsletters.
- Story maps also offer a lot of flexibility and can be as simple or complex as needed to convey information about a wetland program. Basic story maps can be created with little to no GIS experience.

Additional Resources

Story map introduction:
https://storymaps.arcgis.com/

Large culvert installed through an abandoned rail bed to restore the hydrology of a trout stream on Stockbridge-Munsee Community land. Photo courtesy of Alex Brauer, Stockbridge-Munsee Community.

CATEGORIES:

Restoration, including voluntary restoration

Education

Conflict resolution

Location: The Stockbridge-Munsee Band of Mohican Indians Reservation is located in Shawano County, Wisconsin. Original tribal lands were on the East Coast in New York and Massachusetts.

Size of Tribal Lands/Reservation Acreage: 25,330 acres

Population: ~1,600 members

Size of Wetlands: 6,500 acres, 26% of land base

EPA Region: 5

Wetland Program Plan (WPP) Status: WPP developed under a Wetland Program Development Grant for 2015–2020, incorporating three of four core elements (available here); updated plan for 2022–2026 in progress.

Tribal Website: https://www.mohican.com/

Case Author: Mike Jones, Stockbridge-Munsee Community Wetland Specialist

Stockbridge-Munsee Community | Resolving Restoration Project Conflict

The Stockbridge-Munsee Community (SMC) received grant funding to remove multiple sections of an abandoned railroad bed that the tribe had recently acquired.

The presence of the rail bed embankment and perched culverts had severely altered the hydrologic connectivity of adjacent wetlands and a small trout stream for over 100 years. The original project called for the removal of just under 1 mile of rail bed to reconnect about 258 acres of wetland and 2 miles of stream habitat. Although approved by tribal leadership, the project met resistance from some members of the tribal community and a petition was started to halt construction. The location and length of the rail bed made it a popular road for tribal members to use for hunting access, ATV use, snowmobiling, and general travel. Some also argued that it was important for access for future timber harvest.

To address concerns, the tribe's hydrologist and wetland specialist held a public meeting. Although only a small number of people attended, the meeting provided a forum for community members to voice their opinions and give specific reasons why they were against the project. It also gave Environmental Department staff the opportunity to explain the ecological benefits of the project and clear up some misconceptions. Following the public meeting, the Tribal Council voted to suspend the project as initially proposed. Conversations continued between Environmental Department staff, petitioners, and the Tribal Council to evaluate options for compromise.

In the end, a compromise was reached that changed the project design considerably. Instead of removing the rail bed, SMC installed five large culverts to restore hydrology. Because the grant had already been awarded, these changes required a lot of time and effort to adjust the project plan and gain approval from the funding source. The new design created additional challenges with engineering, culvert construction, and installation.

Overall, the project was successful in reconnecting a large amount of stream and wetland habitat while still providing road use by the tribal community.

However, restoration remains somewhat incomplete, as natural hydrology is still affected by the new structures and remaining rail bed. The culverts also require additional maintenance, such as clearing beaver dams, which would not have been an issue if the rail bed had been removed.

While the tribe has several committees that provide project review for projects affecting tribal lands, there is no formal process for soliciting input from the tribal community. In this case, having an efficient and consistent system for involving the community in project planning may have allowed for issues to be addressed early on and incorporated into the project proposal.

Aerial photo of the abandoned rail bed post-restoration. Photo courtesy of Mike Jones, Stockbridge-Munsee Community.

Key Takeaways

- It is critically important to consider all stakeholder views when beginning project planning, especially in large projects that have potentially large impacts on the community. Take the time to solicit input through things like surveys, public meetings, or flyers.
- Try to come up with multiple project options to present to the community. This can sometimes help people better envision the project and make a more informed choice.
- Understand and respect that people have many different values and priorities and be willing to make compromises. It is easy to become too focused on ecological impacts and benefits without considering how others may view a project.
- Including the community early on also provides an opportunity for community members to take more ownership of a project so they have a vested interest in seeing it succeed.

Underplanting site in a riparian black ash wetland to mitigate the effects of the invasive emerald ash borer on Stockbridge-Munsee Community land. Photo courtesy of Mike Jones, Stockbridge-Munsee Community.

CATEGORIES:

Assessment

Grant-supported projects

Partnerships with federal or state agencies, academic institutions, or others

Restoration, including voluntary restoration

Location: The Stockbridge-Munsee Band of Mohican Indians Reservation is located in Shawano County, Wisconsin. Original tribal lands were on the East Coast in New York and Massachusetts.

Size of Tribal Lands/Reservation Acreage: 25,330 acres

Population: ~1,600 members

Size of Wetlands: 6,500 acres, 26% of land base

EPA Region: 5

Wetland Program Plan (WPP) Status: WPP developed under a Wetland Program Development Grant for 2015–2020, incorporating three of four core elements (available here); updated plan for 2022–2026 in progress.

Tribal Website: https://www.mohican.com/

Case Author: Mike Jones, Stockbridge-Munsee Community Wetland Specialist

Stockbridge-Munsee Community | Emerald Ash Borer/Black Ash Project

Black ash wetlands are common on the Stockbridge-Munsee Community (SMC) Reservation and are an important ecological and cultural species. These wetlands face a major threat from emerald ash borer (EAB), an invasive beetle that kills native ash trees.

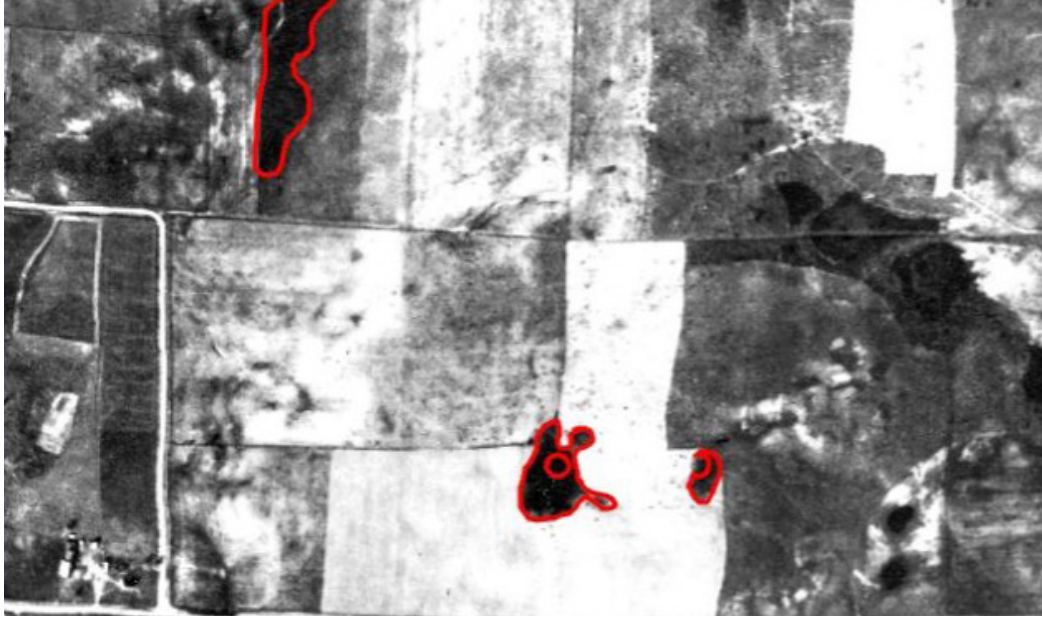
EAB invasion is expected to cause water level rise and major vegetation community shifts in black ash wetlands.

SMC was awarded an U.S. Environmental Protection Agency (EPA) Wetland Program Development Grant (WPDG) to develop a monitoring protocol for black ash wetlands to document pre- and post- EAB conditions. SMC established 12 long-term sites to monitor water level, water temperature, trees, shrubs, and herbaceous vegetation. Each site also has been included as a survey location for SMC's annual EAB trap survey. The monitoring sites will serve as controls to guide and assess the effectiveness of mitigation and restoration efforts. SMC was awarded a subsequent WPDG to expand the research and include sap flow monitoring to assess the functional role of black ash and associated tree species on the water budget of these systems. Researchers from the U.S. Forest Service and University of Wisconsin–Madison are partners in this monitoring and research.

To mitigate EAB impacts, SMC is underplanting black ash stands with suitable replacement species, allowing seedlings to become established before EAB invades. Currently, priority underplanting sites are located along trout streams, where native brook trout will likely suffer from the loss of shading from the ash canopy. Funding from the Natural Resources Conservation Service's Environmental Quality Incentives Program has been used to offset the planting costs. SMC has worked with the Wisconsin Natural Resources Conservation Service to develop new standards and payment rates that better reflect actual costs and make future underplanting more financially feasible. Annual species-specific survival data will help guide future underplantings by choosing the best possible replacement species. While it is infeasible to complete these plantings in all the black ash swamps on the reservation, the hope is that these efforts will reduce the complete loss of these systems and protect the wetlands most vulnerable to change.

Key Takeaways

- Invasive species are a major threat to wetlands, and major efforts are required to limit those impacts.
- Monitoring wetlands is critical to documenting natural conditions and identifying threats, such as invasive species, so early action can be taken to protect the wetlands.
- Partnering with outside agencies and/or universities is incredibly valuable, especially in research-focused projects. These partnerships allow tribes to take advantage of expertise and resources that most tribes do not have.



GIS-based wetland delineation based on historical aerial photos used to identify potentially restorable wetlands. Photo courtesy of GeoSpatial Services, Saint Mary's University of Minnesota.

CATEGORIES:

Assessment

Grant-supported projects

Mapping, inventory

Partnerships with federal or state agencies, academic institutions, or others

Location: The Stockbridge-Munsee Band of Mohican Indians Reservation is located in Shawano County, Wisconsin. Original tribal lands were on the East Coast in New York and Massachusetts.

Size of Tribal Lands/Reservation Acreage: 24,000 acres

Population: ~1,470 members

Size of Wetlands: 6,500 acres, 28% of land base

EPA Region: 5

Wetland Program Plan (WPP) Status: WPP developed under a Wetland Program Development Grant for 2015–2020, incorporating three of four core elements (available here)

Tribal Website: https://www.mohican.com/

Case Author: Mike Jones, Stockbridge-Munsee Community Wetland Specialist

Stockbridge-Munsee Community | Potentially Restorable Wetlands Project

The Stockbridge-Munsee Community (SMC) was awarded an EPA Wetland Program Development Grant to map potentially restorable wetlands (PRWs) throughout eight HUC-12 sub-watersheds overlapping the SMC Reservation.

SMC contracted St. Mary's University of Minnesota, GeoSpatial Services, to conduct the GIS-based analysis.

Multiple processes were used to map the PRWs. First, "historic wetlands" were delineated using photointerpretation of 1938 aerial imagery. Historic and current wetland extents and vegetation types were visually compared and, when possible, the cause of any observed change was documented (e.g., anthropogenic change, beaver influence).

Another method for identifying PRWs was to use overlay analysis of several geospatial datasets, including wetland polygons, soils, and elevation-derived hydrological rasters. Road and land use layers were then used to identify permanently altered wetlands where restoration was infeasible. Very small polygons were eliminated from the dataset for the same reason.

When these methods were combined, 178 PRWs were identified throughout the watershed. SMC has used this dataset to guide wetland restoration planning and has completed further site evaluations. SMC staff used Wisconsin's Wetland Rapid Assessment Methodology to assess 50 of the PRWs and get a better understanding of site conditions. They also use these locations to assess restoration potential on newly acquired lands.

Key Takeaways

- Restoration is a key component of the SMC Wetland Program Identifying PRWs helps guide those restoration efforts.
- Partnering with St. Mary's University allowed the tribe to utilize the University's extensive expertise in wetland-related GIS analysis. Tribal staff did not have the necessary skills or time to complete that type of analysis, so this partnership was critical to creating a useful final product.

The Swinomish Tribe is using traditional knowledge to incorporate cultural values into their wetland monitoring and management. This is one of many wetlands for which they have identified the culturally significant plants. Photo courtesy of Kari Neumeyer.

CATEGORIES:

- Assessment
- Education
- Mapping, inventory
- Regulatory programs
- Traditional Ecological Knowledge/ cultural uses of wetlands

Location: Swinomish Reservation is on the southeast peninsula of Fidalgo Island.

Size of Tribal Lands/Reservation Acreage: ~10,350 acres

Population: ~1,440 enrolled members

Size of Wetlands: The reservation includes 54 wetlands across 7,450 acres of upland and approximately 2,900 acres of tidelands.

EPA Region: 10

Wetland Program Plan (WPP) Status: The Swinomish Tribe does not have an active WPP approved by EPA.

Tribal Website: https://swinomish-nsn.gov/

Case Author: Todd A. Mitchell, Environmental Director, Department of Environmental Protection, Swinomish Indian Tribal Community

Swinomish Tribe | Using Indigenous Science to Protect Wetlands: The Swinomish Tribe's Wetlands Cultural Assessment Project

"Traditional" wetland physical assessment modules do not adequately identify tribal cultural values of wetlands and thus wetlands may not be adequately protected for cultural uses.

The Swinomish Wetlands Cultural Assessment Project has developed a cultural resource scoring module that can be incorporated into wetland assessments to better inform wetland protections.

This project built on a 1999 wetlands inventory that identified 54 wetlands on the Swinomish Reservation and assessed 36 for functions such as flood and stormwater control, base flow and groundwater support, and shoreline and erosion protection.

Local native knowledge was gathered about the traditional uses of 99 native wetland plant species, pulling from 1950s interviews with Skagit River tribes' elders, 2003 interviews with Swinomish elders, and other sources. The list of 99 plants were categorized by type (trees, shrubs, ferns, aquatics, and grasses), and a cultural scoring matrix was developed based on the presence of traditionally used plants in several use categories, including construction, ceremonial, subsistence, medicinal, common use, plant rarity, and place of value for each wetland. The combined score of the cultural and physical modules provides an overall wetland score that relates to prescribed buffer protection widths.

With this local native knowledge incorporated into wetland assessments, the Swinomish Tribe is protecting and preserving Swinomish Reservation wetlands for both cultural uses and ecological functionality through its wetland protection law.

Key Takeaway

The Swinomish Tribe hopes this innovative method can serve as a model in combining traditional cultural values with scientific methods to help promote the breadth of knowledge their ancestors possessed into modern practical environmental protection.

The Swinomish Tribe is working to have this collection of research benefit the community, not only to help protect wetlands and associated plants, but also to protect and reinvigorate the knowledge of traditional uses of those plants and places. To facilitate the work, the tribe is developing tribal community outreach materials, including a guide on traditional plant uses to distribute the collected information back to the community through the materials and curriculum for high school Indigenous science classes.

Additional Resources

Mitchell, T. 2005. Native Uses of Wetlands and Natural Resources Planning: The Swinomish Indian Tribal Community's Wetlands Cultural Assessment. Practicing Anthropology 27(1): 11–14. https://swinomish-nsn.gov/media/5313/practicing_anthropology_27.1.pdf.

Mitchell, T., and N.J. Casper. 2018. Using Traditional Ecological Knowledge to Protect Wetlands: The Swinomish Tribe's Wetlands Cultural Assessment Project. Salish Sea Ecosystem Conference. 73. https://cedar.wwu.edu/ssec/2018ssec/allsessions/73.

Mitchell, T. A., N. J. Casper, L. Thomason Logan, E. M. Colclazier, and K.J.R. Mitchell, 2022. Using Traditional Ecological Knowledge to Protect Wetlands: The Swinomish Tribe's Wetland Cultural Assessment. Manuscript submitted for publication.

Wisconsin Tribal Conservation Advisory Council.

CATEGORIES:

Education

Intertribal coordination

Location: 11 native tribes in Wisconsin

Member Tribes:

- Bad River Band of Lake Superior Chippewa Indians
- Forest County Potawatomi Community
- Ho-Chunk Nation
- Lac Courte Oreilles Band of Lake Superior Chippewa Indians
- Lac du Flambeau Band of Lake Superior Chippewa Indians
- Menominee Indian Tribe of Wisconsin
- Mole Lake Band of Lake Superior Chippewa Indians
- Oneida Tribe of Indians of Wisconsin
- Red Cliff Band of Lake Superior Chippewa Indians
- St. Croix Chippewa Indians of Wisconsin
- Stockbridge-Munsee Indian Community

EPA Region: 5

Wetland Program Plan (WPP) Status: Tribal WPP submitted to and approved by EPA (available here, in the Region 5 section)

Working Group Website: https://www.wtcac.org/

Case Author: Randy Poelma, Environment Sciences Program Manager, Ho-Chunk Division of Environmental Health

Wisconsin Tribes | Wisconsin Tribal Wetland Working Group

In 2001, the Wisconsin Tribal Conservation Advisory Council (WTCAC) established a forum for the 11 federally recognized Native American tribes in Wisconsin.

The Council aims to identify and solve natural resource issues on tribal lands by working cooperatively on conservation issues that are important at the tribal, state, and national levels. The Council established a wetland subcommittee to identify tribal wetland program needs, thus establishing the WTCAC Tribal Wetland Working Group (WI TWWG), the first tribal wetland working group in U.S. Environmental Protection Agency (EPA) Region 5.

The group's objectives are to promote wetland resources training opportunities for tribes; provide for information sharing and transfer of technical expertise on restoration, protection, assessment, and management and increase awareness and appreciation of the cultural importance of wetlands beyond the tribes. Their first meeting was at the 2016 Wisconsin Wetland Association Annual Science Conference, and the WI TWWG was made an official subcommittee of WTCAC in March 2017.

Key Takeaway

The WI TWWG is helping tribes broaden their capacity to protect these culturally important resources.

Since its inception, the WI TWWG has had multiple meetings, submitted and received noncompetitive grant funding from EPA Region 5, and held training on wetland assessments (i.e., Wetland Rapid Assessment Methodology 2.0, Time-Meander Sampling Protocol for Wetland Floristic Quality Assessment), as well as basic and advanced wetland delineation training. Additional upcoming activities include onsite restoration site visits and training, coordination meetings, hydric soils training, and a potential tribal wetland video series

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Appendix C: Funding Matrix

The chart below identifies several recurring national governmental grant and funding sources that may be especially relevant to supporting tribal wetland protection and management programs. Please note that there are numerous other potential funding sources that may be offered on a state or regional scale. Non-governmental sources of support through foundations or corporations may also be available. Funding cycles, application rules, match requirements and flexibility, and eligible projects and activities may change year to year, so it is essential to contact the funding organization for the most up-to-date information.

Program Name	Funder	Match?	Useful to Know
Wetland Program Development Grants	U.S. EPA	Yes (25% or 5% with hardship waiver)*	Contact the EPA Regional Enhancing State and Tribal Programs coordinator for updated information. See https://www.epa.gov/wetlands/wetland-program-development-grants.
CWA Section 319 Funding	U.S. EPA	Yes (40% or 10% with hardship waiver)*	Base grant funding and periodic competitive grants; funds activities related to nonpoint source pollution control; to be eligible, tribes must have TAS status. See https://www.epa.gov/nps/319-grant-program-states-and-territories.
General Assistance Program	U.S. EPA	No	Funds for planning and establishing environmental protection programs in Indian Country; for capacity building rather than implementation. See https://www.epa.gov/tribal/indian-environmental-general-assistance-program-gap.
Five-Star and Urban Waters Restoration Grant Program	NFWF	Yes (1:1)	Most awards are $10–$40K. They can fund restoration projects; five partners are required, including the applicant. The match requirement can be met by in-kind services. See https://www.nfwf.org/programs/five-star-and-urban-waters-restoration-grant-program.
CWA State Revolving Fund: Clean Water Indian Set-Aside	U.S. EPA	No	Low-interest loans provided by states; can be used for wetland restoration or preservation, green infrastructure. See https://www.epa.gov/cwsrf.
CWA Section 106 Grants	U.S. EPA	No	May be used for monitoring and assessment and development of water quality standards, among other things; must have TAS authority. See https://www.epa.gov/water-pollution-control-section-106-grants.
Agricultural Conservation Easement Program	NRCS	No	Financial assistance to purchase agricultural land easements that protect the agricultural use and conservation values. See https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/easements/acep/.
North American Wetlands Conservation Act Grant Program	USFWS	Yes	Funds protection, restoration, and/or enhancement of wetlands and associated upland habitats for the benefit of wetlands-associated migratory birds. See https://www.fws.gov/service/north-american-wetlands-conservation-act-nawca-grants-us-standard.

* For tribal grant applications submitted as part of a Performance Partnership Grant, no match is required. See "Class Exception to the Cost Share Requirements for Tribal and Intertribal Consortia Performance Partnership Grants (PPGs) at 40 CFR 35.536" (https://www.epa.gov/grants/rain-2022-g01).

Program Name	Funder	Match?	Useful to Know
Tribal Wildlife Grants	USFWS	No	Funding includes wildlife and habitat conservation planning; laboratory and field research; mapping, field surveys, and monitoring; preservation; education; and salaries, equipment, consultant services, subcontracts, and travel. See https://www.fws.gov/service/tribal-wildlife-grants.
National Fish Passage Program	USFWS	Yes (50% goal but flexible)	Works with local communities, including tribes, on a voluntary basis to restore rivers and conserve our nation's aquatic resources by removing or bypassing barriers to fish passage. See https://www.fws.gov/service/fish-passage-technical-and-planning-assistance.

Appendix D: Additional Resources

Core Elements Framework

- EPA, *Core Elements of an Effective State and Tribal Wetlands Program*: https://www.epa.gov/wetlands/core-elements-effective-state-and-tribal-wetland-programs

Wetland Program Plan Development

- Association of State Wetland Managers, *Wetland Program Plans Handbook: A Resource to Assist States and Tribes in Developing Strategic Approaches to Achieve Comprehensive Wetland Programs* (2013): https://www.nawm.org/pdf_lib/wetland_program_plans_handbook.pdf
- EPA, *State and Tribal Wetland Program Plans* webpage: https://www.epa.gov/wetlands/state-and-tribal-wetland-program-plans
- EPA, *Building State and Tribal Wetland Programs: Core Elements Framework, Wetland Program Development Grants Changes, and Wetland Program Plans* memorandum (2009): https://www.epa.gov/wetlands/2009-wetland-program-plan-memorandum

Funding

- NAWM, *Sustainable Financing* webpage: https://www.nawm.org/wetland-programs/sustainable-finance/
- EPA, *Wetland Program Development Grants and EPA Wetlands Grant Coordinators* webpage: https://www.epa.gov/wetlands/wetland-program-development-grants-and-epa-wetlands-grant-coordinators
- EPA, *Wetland Grants Database*: https://ordspub.epa.gov/ords/wgd/f?p=101:50
- EPA, *Wetland Program Development Grants—Category Definitions* webpage: https://www.epa.gov/wetlands/wetland-program-development-grants-category-definitions
- EPA, *Fiscal Year 2020 and Fiscal Year 2021 National Wetland Program Development Grants* request for applications: https://www.epa.gov/sites/default/files/2020-10/documents/hq_fy20-21_wpdg_rfa_-_2020_october_29_final.pdf
- EPA, *RAIN-2022-GO1: Class Exception to the Cost Share Requirements for Tribal and Intertribal Consortia Performance Partnership Grants (PPGs) at 40 CFR 35.536* memorandum (September 30, 2021): https://www.epa.gov/grants/rain-2022-g01
- EPA, *Tribal Grants under Section 106 of the Clean Water Act* webpage: https://www.epa.gov/water-pollution-control-section-106-grants/tribal-grants-under-section-106-clean-water-act
- EPA, *Tribal Nonpoint Source Program* webpage: https://www.epa.gov/nps/tribal-nonpoint-source-program
- EPA, *Indian Environmental General Assistance Program (GAP)* webpage: https://www.epa.gov/tribal/indian-environmental-general-assistance-program-gap
- EPA, *EPA and Other Federal Grants That Include Wetlands Restoration* webpage: https://www.epa.gov/wetlands/epa-and-other-federal-grants-include-wetlands-restoration

Mapping, Monitoring, and Assessment:

- NAWM, *Wetland Mapping Consortium Webinars* webpage: https://www.nawm.org/index.php
- Colorado Wetland Information Center, *Ecological Condition Assessment Methods* webpage: https://cnhp.colostate.edu/cwic/condition/ecological/
- EPA, *Wetlands Monitoring and Assessment* webpage: https://www.epa.gov/wetlands/wetlands-monitoring-and-assessment
  - A necessary foundation for development of wetland-specific water quality standards (WQS) is an understanding of existing wetland types and characterization of desired quality/condition. This is usually achieved through wetlands monitoring and assessment.

- EPA, *Application of Elements of a State Water Monitoring and Assessment Program for Wetlands* (April 2006): https://www.cramwetlands.org/sites/default/files/Wetland_Elements_Final.pdf
- EPA, *Wetland Monitoring & Assessment: A Technical Framework:* https://www.epa.gov/sites/default/files/2021-01/documents/wetland_monitoring_assessment_a_technical_framework.pdf
- EPA, *How Do I Develop a Wetlands Monitoring Program?* webpage: https://www.epa.gov/wetlands/how-do-i-develop-wetlands-monitoring-program
- EPA, *Review of Rapid Assessment Methods for Assessing Wetland Condition* (March 2004): https://nepis.epa.gov/Exe/ZyPDF.cgi/P1003GXN.PDF?Dockey=P1003GXN.PDF
- EPA, *Benefits and Applications of Wetland Bioassessments* webpage: https://www.epa.gov/wetlands/benefits-and-applications-wetland-bioassessments
- EPA, *Wetland Bioassessment Resources* webpage: https://www.epa.gov/wetlands/wetland-bioassessment-resources
- EPA, *Nutrient Criteria Development Document: Wetlands* webpage, featuring different wetlands monitoring modules: https://www.epa.gov/nutrient-policy-data/nutrient-criteria-development-document-wetlands#wetlands
- EPA, *Volunteer Monitoring Can Protect Wetlands* webpage: https://www.epa.gov/wetlands/volunteer-monitoring-can-protect-wetlands
- EPA, *National Wetland Condition Assessment* webpage: https://www.epa.gov/national-aquatic-resource-surveys/nwca
- EPA, *Impacts on Quality of Inland Wetlands of the United States: A Survey of Indicators, Techniques, and Applications of Community Level Biomonitoring Data* (EPA/600/3-90/073, August 1990, now out of print):
  - "Because of the lack of appropriate comparative studies of wetlands, the report does not provide biocriteria for wetlands, evaluate or prioritize potential indicators of wetland condition, nor endorse specific techniques for wetland biomonitoring and data analysis. Its intended use is mainly as a technical source document for future design, testing, and reporting of indicators."
  - "[This report] describes (a) how existing resource data might be applied in the designation of "uses" for wetlands, (b) ambient biological criteria for wetlands might be developed or modified, and (c) how wetlands might be periodically sampled (and data interpreted) to estimate their relative ecological condition, compliance with biological criteria, or need for restoration."
- EPA, *Methods for Evaluating Wetland Condition* (March 2002–December 2008)
  - These modules are a starting point to help states and tribes establish biological and nutrient water quality criteria specifically refined for wetlands. They provide information that will help states and tribes develop biological assessment methods to evaluate both the overall ecological condition of wetlands and nutrient enrichment.
- NC Wetlands, *Developing Coefficients of Conservatism to Facilitate Floristic Quality Assessment of Wetlands in the Southeastern United States: Project Summary:* https://www.ncwetlands.org/project/coefficient_conservatism/
- USFWS National Conservation Training Center: https://www.fws.gov/training and course guide: https://www.fws.gov/media/nctc-course-guide

Water Quality Standards

- Environmental Law Institute, *State Wetland Program Evaluations: Phases I–IV* (2005–2007): https://www.eli.org/research-report/state-wetland-program-evaluation-phase-iv
  - This set of reports details findings of a multi-phase study designed to describe and analyze seven components of state wetland programs—including WQS. The reports identify seven states with wetland-specific elements to their WQS and provide a short overview of each program.

- Environmental Law Institute, *State Wetland Protection: Status, Trends, and Model Approaches* (March 2008): https://www.eli.org/research-report/state-wetland-protection-status-trends-model-approaches
  - Section III provides a summary of states with wetland-specific WQS, including a table that breaks out which elements (designated uses, criteria, and/or antidegradation) those states have developed.
- EPA, *Wetland Water Quality Standards* webpage: https://www.epa.gov/wetlands/wetland-water-quality-standards
- EPA, *Templates for Developing Wetland Water Quality Standards* webpage: https://www.epa.gov/wqs-tech/templates-developing-wetland-water-quality-standards
- EPA, *Water Quality Standards Handbook* (updated 2017): https://www.epa.gov/wqs-tech/water-quality-standards-handbook
- EPA, *Our Water, Our Future video* (2003): https://www.youtube.com/watch?v=EY6r810Kwac
- EPA, *TAS Application Template for Water Quality Standards and Water Quality Certifications*: https://www.epa.gov/wqs-tech/water-quality-standards-tools-tribes#tab2
- EPA, *Model WQS Template for Waters on Indian Reservations*: https://www.epa.gov/wqs-tech/water-quality-standards-tools-tribes#tab3
- EPA, *Water Quality Standards for Wetlands: National Guidance* (July 1990): https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=00001PW6.TXT; available as Appendix D of the *Water Quality Standards Handbook*, second edition (August 1994): https://www.epa.gov/sites/default/files/2014-10/documents/handbook-appendixd.pdf
  - This document provides program guidance to states on how to apply WQS to wetlands. This guidance reflects the level of achievement EPA expected states to accomplish by the end of fiscal year 1993. Phase 1 activities presented in this guidance include the development of WQS elements for wetlands based on existing information and science. Phase 2 involves the further refinement of these basic elements using new science and program developments.
- EPA, *An Approach for Evaluating Numeric Water Quality Criteria for Wetlands Protection* (July 1991): https://www.epa.gov/sites/default/files/2018-10/documents/an-approach-evaluating-numeric-wqc-wetlands.pdf; available as Appendix E of the *Water Quality Standards Handbook*, second edition (August 1994): https://www.epa.gov/sites/default/files/2014-10/documents/handbook-appendixe.pdf
  - "This report provides an overview of the need for standards and criteria for wetlands and a description of the national numeric aquatic life criteria….[It] provides a possible approach…for detecting wetland types that might not be protected by direct application of national numeric criteria" and for making modifications based on site-specific guidelines.
- EPA, *Questions and Answers on: Antidegradation* (August 1985): https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=200137AI.TXT; available as Appendix G of the *Water Quality Standards Handbook*, second edition (August 1994): https://www.epa.gov/sites/default/files/2014-10/documents/handbook-appendixg.pdf
  - "This document provides guidance on the antidegradation policy component of WQS and its application. The document begins with the text of the policy as stated in the water quality standards regulation, 40 CFR 131.12 (40 FR 51400, November 8, 1983), the portion of the Preamble discussing the antidegradation policy, and the response to comments generated during the public comment period on the regulation. The document then uses a question-and-answer format to present information about the origin of the policy, the meaning of various terms, and its application in both general terms and in specific examples."
  - Question 13 addresses the application of antidegradation policy in the case of wetland fill permits under Clean Water Act section 404.

Wetlands Restoration

- Wisconsin Department of Natural Resources, *Wetlands Restoration and Management* webpage: https://dnr.wisconsin.gov/topic/Wetlands/restoration.html

Traditional Ecological Knowledge

- White House announcement and memorandum on Indigenous Traditional Ecological Knowledge: https://www.whitehouse.gov/ceq/news-updates/2021/11/15/white-house-commits-to-elevating-indigenous-knowledge-in-federal-policy-decisions/ and https://www.whitehouse.gov/wp-content/uploads/2021/11/111521-OSTP-CEQ-ITEK-Memo.pdf
- EPA, *The National EPA–Tribal Science Council Traditional Ecological Knowledge Workshop—June 2013: EPA Caucus Report Out:* https://www.epa.gov/sites/default/files/2015-10/documents/tsc-epa-caucus-tek-workshop-report-out-final-draft.pdf
  - This workshop was held in Syracuse, New York, hosted by the Onondaga Nation and the State University of New York, College of Environmental Science and Forestry's Center for Native Peoples and the Environment. Presentations and discussions by tribes, tribal elders, federal agencies, and tribal colleges and universities provided an overview of current uses of TEK that specifically focused on climate change, environmental decision-making, and tribal agriculture and subsistence practices.
- USGS, *Traditional Ecological Knowledge (TEK): An Introduction and Discussion of TEK's Potential to Inform Adaptive Management* presentation (2012): https://www.usbr.gov/uc/progact/amp/twg/2012-04-16-twg-meeting/Attach_03c.pdf
  - This 2012 event considered origins and definitions of TEK, where western science and TEK are complementary, and barriers to integrating TEK in environmental management.
- EPA, *Environmental Justice for Tribes and Indigenous Peoples* webinar series (2020 and 2021): https://www.epa.gov/environmentaljustice/environmental-justice-tribes-and-indigenous-peoples
  - This webinar series focused on implementing the agency's environmental justice policy with respect to tribes by enhancing environmental justice integration, building capacity, and providing technical assistance. Two of the sessions (9-15-2021 and 10-19-2021) dealt with traditional knowledge, looking at both federal agencies' considerations and the tribal experiences working with federal agencies to include traditional knowledge in management of resources.

Intertribal Workgroups and Consortia

- Code of Federal Regulations, *Section 35.504: Eligibility of an Intertribal Consortium:* https://www.ecfr.gov/current/title-40/chapter-I/subchapter-B/part-35/subpart-B/subject-group-ECFR7560dab1b022383/section-35.504
- Environmental Law Institute, *Report on Lessons Learned from the Experiences of Tribal Wetlands Working Groups*. Prepared for EPA Region 5, Water Division. EPA Contract No. GS-10F-0330P. November 2021. Contact EPA Region 5 Wetlands Program for a copy.
- PNW TWIG, *Pacific Northwest Tribal Wetlands Working Group* website: https://pnwtwig.wordpress.com/
- WTCAC, *Wisconsin Tribal Conservation Advisory Council* website: https://www.wtcac.org/