



CLEAN WATER ACT

Priorities for Offset
Policies that Benefit
the Environment and
Communities



About EPIC

The Restoration Economy Center, housed in the national nonprofit Environmental Policy Innovation Center (EPIC), aims to increase the scale and speed of high-quality, equitable restoration outcomes through policy change.

The mission of EPIC is to build policies that deliver spectacular improvement in the speed and scale of conservation. EPIC focuses on a narrow set of strategies:

- Improving policies that allow private sector funding or stewardship to expand or supplant public or charitable conservation work
- Transforming government policies to focus on what matters—outcomes
- Eliminating the organizational barriers that prevent public agencies from adapting to 21st century solutions

We believe that innovation and speed are central to broadening efforts to conserve wildlife, to restore special natural places, and to deliver to people and nature the clean water they need to thrive. To achieve those goals, conservation programs must evolve to accommodate our modern understanding of human behavior and incentives and the challenges posed by humanity’s expanding footprint. We embrace experimentation with novel ideas in conservation policy, to learn quickly from mistakes and iteratively design effective approaches to be even more successful.

EPIC is a fiscally sponsored project of Sand County Foundation. Sand County Foundation is a non-profit conservation organization dedicated to working with private landowners across North America to advance ethical and scientifically sound land management practices that benefit the environment.

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Table of Contents

Executive Summary 4

Introduction..... 5

 Background on Mitigation 6

 The Clean Water Act 8

 Wetland and Stream Mitigation 8

 Challenges Facing Wetland and Stream Mitigation 9

 Water Quality Trading..... 11

Recommendations to Improve Mitigation Rules and Practices under the CWA..... 13

Immediate Recommendations 14

 1. Refine WOTUS 14

 2. Increase resources and set metrics that hold the Army Corps accountable for fulfillment of mitigation targets and full enforcement of Section 404..... 14

Long-Term Recommendations 16

 1. Create clearer federal guidance on water quality trading programs and collaborative watershed approaches. .. 16

 2. Create a federal advanced mitigation floor price revolving fund. 17

 3. Incentivize the removal of hazardous dams. 17

 4. Move beyond the morass of ‘stacking’ additional ecosystem services 18

Conclusion..... 21

Executive Summary

The Biden administration has made bold commitments to conserve land and transition to renewable energy, including multiple executive orders committing the US to a carbon-free power sector by 2035, a net-zero economy by 2050, building or rebuilding \$1–\$2 trillion in new infrastructure, and delivering 40 percent of the benefits of relevant federal investments to under-resourced communities. These goals will be difficult to accomplish—or substantially delayed—without stronger policies to pre-identify irreplaceable resources to avoid impacting and to incentivize investment in supplies of advance compensatory benefits.

In this paper, we offer immediate and long-term recommendations for how the Biden Administration can strengthen the Clean Water Act and related policies providing the foundation for a supply of wetland, stream, and water quality in advance of impacts. These recommendations were informed by interviews with over thirty-five mitigation experts, including federal agency staff, environmental groups, tribal representatives, and regulated industry.

In this paper, we offer immediate and long-term recommendations for how the Biden Administration can strengthen the Clean Water Act and related policies.

The recommendations:

- Include clarification about intermittent and ephemeral tributaries in the anticipated second Waters of the US (WOTUS) rulemaking process.
- Increase resources and set metrics that hold the Army Corps accountable for ensuring mitigation targets are met and Section 404 is fully enforced.
- Ensure mitigation credits are tied to ecological performance.
- Clarify federal guidance on water quality trading and collaborative watershed approaches.
- Create a federal advanced mitigation fund for water quality to help plan for compensatory mitigation needs over the long term.
- Incentivize the removal of hazardous dams.
- Develop a voluntary market framework for quantifying and rewarding additional ecosystem services that result from mitigation projects under the CWA.

Additional detail can be found in the report.

The Environmental Policy Innovation Center has the capacity to assist agencies in developing policies that dramatically increase the scale, pace, quality and inclusion of environmental restoration. Contact Phoebe Higgins at phiggins@policyinnovation.org and visit restorationeconomy.org to learn more.

Introduction

The Biden administration has made bold commitments to conserve land and transition to renewable energy, including multiple executive orders committing the US to a carbon-free power sector by 2035, a net-zero economy by 2050, building or rebuilding \$1–\$2 trillion in new infrastructure, and delivering 40 percent of the benefits of relevant federal investments to under-resourced communities.

These goals will be difficult to accomplish—or substantially delayed—without stronger policies to pre-identify irreplaceable resources to avoid impacting and to incentivize investment in supplies of advance compensatory benefits.

Many parts of the federal government developed strong policies and approaches to mitigating the impacts of infrastructure and other projects on natural resources between 2015 and 2016. They included, for example, a requirement in a Presidential Memorandum that mitigation policies create predictability for permit applicants. Unfortunately, most of those policies were subsequently dismantled, including the rescinding of a 2016 definition of Waters of the United States.

This paper makes recommendations for improving mitigation rules and practices under the Clean Water Act.

This paper makes **recommendations for improving mitigation rules and practices under the Clean Water Act**. EPIC interviewed over thirty-five mitigation experts to inform our recommendations, including federal agency staff, environmental groups, tribal representatives, and regulated industry. We selected these interviewees based on their deep expertise in how mitigation policies were developed and how mitigation is practiced under different environmental laws and in different regions of the country. Each interviewee informed the contents of the report sections that matched their expertise. Through careful consideration, EPIC selected the recommendations that we believe have the most potential to improve mitigation. (This report is not intended to reflect the views of our interviewees or their organizations.)

This paper:

1. Provides general background on mitigation and the Clean Water Act,
2. Reviews compensatory mitigation that can be used for impacts to wetlands and streams under Section 404 of the CWA and recent regulatory changes,
3. Reviews water quality trading that can be used to improve water quality (CWA Section 402) and/or to meet a National Pollutant Discharge Elimination System (NPDES) permit (CWA Section 303(d)), and
4. Provides immediate and long-term recommendations to improve mitigation rules and practices under the CWA.

Note that this paper is one in a series of briefs containing excerpts from a comprehensive paper – [Net Zero or Better](#) (see Box 1 on the next page, which includes holistic recommendations for mitigation policy).

Box 1. Net Zero or Better Report – Programs, Rules and Policies Covered, and Overall Recommendations

The report *Net Zero or Better: Priorities for Offset Policies that Benefit the Environment and Communities* (November 2021) makes statute- and agency-specific recommendations for improving mitigation rules and practices. The report covers the following programs, rules, and policies:

- Endangered Species Act
- National Environmental Policy Act
- Migratory Bird Treaty Act
- Bald and Golden Eagle Protection Act
- Federal Land Policy and Management Act
- National Forest Management Act
- Associated policies relating to tribal engagement with mitigation

Overall recommendations:

- Quickly restoring specific Obama-era policies related to mitigation (where they existed) that were rescinded between 2017 and 2020.
- Developing additional necessary agency-wide mitigation policies and implementing them through step-down guidance and other measures. In many cases, we recommend complementing this effort by assigning dedicated staff to work on mitigation and conducting staff training on mitigation.
- Supporting initiatives and funding that create advance offset supplies such that, when offset needs arise, the private sector or government agencies already have produced a ready supply of relevant offsets, or at least the future projects that can provide them.
- Putting administrative procedures in place to improve the permitting timeline for important infrastructure programs as well as ecological restoration and climate resilience permitting.

Background on Mitigation

“Mitigation” (or compensatory mitigation) refers to the overall process of avoiding, minimizing, and then offsetting negative impacts on natural resources. Some advocates argue that compensatory mitigation allows development that would otherwise not occur. We are not aware of evidence of that being true. Instead, in circumstances that predate compensatory mitigation, what appears to happen is that damage is simply permitted, not that permits are not issued. For example, before the late 1990s and the development of stream mitigation banking, impacts to streams were simply allowed. As stream mitigation banking developed, impacts were both avoided and offset for the first time, although this is still not the case in some states and Army Corps regions.

Better offset policies can also create jobs in restoration while enhancing certainty around the costs of doing business for regulated industry. Proactive planning for where to implement offsets can also help ensure that under-resourced communities receive water quality, flood control, outdoor recreation, and other benefits from restoration projects.

Many mitigation principles (Table 1) transcend any particular law. For example, the principle of additionality—that one should have to prove or document that a resource’s condition is better off than it would be, but for the action. If one policy has it and another doesn’t, it is simply a flaw in the policy and the agency culture that somehow believes it doesn’t matter. From 2015 to 2017, a Presidential Directive¹ made those principles clear, especially to agencies that operated in their own silos and were not aware of patterns that emerged in other areas of law, science, and regulation. Mitigation principles exist in some mitigation policies, including those at the state level, and make sense in almost all contexts.

Table 1. Mitigation principles

Theme	Notes
Irreplaceable natural resources	<ul style="list-style-type: none"> Require land management plans to identify irreplaceable resources. Define (i.e., map) irreplaceable resources where only avoidance is appropriate.
Clear goalposts for how much is enough	<ul style="list-style-type: none"> Done right, no net loss, net benefit, and net zero are all examples of goals that allow both an agency and a potential permittee to understand and reach an agreement around “how much mitigation is enough.” If an agency’s mitigation policies are not seeking to achieve no net loss, net zero, or net benefit for a finite and rare resource, then by definition, those policies are facilitating the resource becoming increasingly rare. If subsequent permits contribute to that rarity, it’s by agency design and not the permittees’ fault or a fault of development writ large.
Additionality	<ul style="list-style-type: none"> Additionality analysis should be required by all federal agencies to make sure that preservation, restoration, and management actions truly offset new damage to resources.
Advance compensation preference	<ul style="list-style-type: none"> A policy preference for advance compensatory actions will almost always produce better results for natural resources.
Durability	<ul style="list-style-type: none"> Durability means that environmental benefits of offsetting actions are expected to endure for at least as long as the harm they are compensating continues.
Clear and measurable process for mitigation and mitigation evaluation	<ul style="list-style-type: none"> Require quantitative ecological performance standards on measures that can actually be delivered. Require a balance of long-term financial assurances, insurance, or other mechanisms to mitigate risks to durability.
Equal standards for different types of compensatory mitigation	<ul style="list-style-type: none"> Documentation standards, insurance standards, and performance requirements should be similar regardless of whether a private entity or public agency provides compensatory offsets.

¹ Presidential Memorandum on Mitigating Impacts on Natural Resources From Development and Encouraging Related Private Investment, 80 FR 68743. (2015, November 3).

The Clean Water Act

The Clean Water Act was established to restore and maintain the chemical, physical, and biological integrity of the nation's waters. This includes provisions in Section 404 of the law that protects wetlands, streams, and other aquatic resources; states' accountability for setting and meeting water quality standards (Section 303); and the regulation of point sources of pollution (Section 402) through the permit-based National Pollutant Discharge Elimination System (NPDES). The Environmental Protection Agency (EPA) primarily administers the CWA and associated regulations in coordination with state governments. In coordination with EPA, the US Army Corps of Engineers administers permitting of dredging and filling aquatic resources under CWA Section 404.

Although the CWA, state programs, and funding have led to great improvements for water resources since the law's passage in 1972, water quality and wetland loss remain significant problems in the US. A 2017 EPA survey of the nation's rivers, streams, lakes, reservoirs, and ponds found that over half of those studied were impaired, often meaning they were not viable habitats for many aquatic species or were not safe to drink.² The rate of wetland loss has slowed dramatically since the 1970s, when over 450,000 acres were lost annually.³ In more recent years, the EPA has claimed achieving no net loss based on acres of permitted impacts and acres of compensatory mitigation.⁴ However, this claim assumes that compensatory mitigation fully meets performance standards, which researchers have found to be not the case.⁵ A National Academies report from 2001 concluded that no net loss was likely not being achieved at the time.⁶ Stronger policies and enforcement are sorely needed to address the large number of impaired US waterways and to correct the health disparities caused by lack of access to clean drinking water and exposure to wastewater. Stronger implementation of existing regulations and policies can ensure that water quality and wetland and stream mitigation markets work efficiently to incentivize high-quality restoration, and new strategies can boost the supply of offsets and ensure equitable sharing of and improvements to habitat and water quality.

Stronger policies and enforcement are sorely needed to address the large number of impaired US waterways.

Wetland and Stream Mitigation

The CWA Section 404 Regulatory Program manages wetland and stream mitigation and regulates discharges of dredged or fill material into the "waters of the United States" (WOTUS). The goal of the Section 404 program is to achieve overall no net loss of wetland functions and values, however this goal is "a statement of policy or an interpretive rule" and "does not appear in Corps or EPA regulations."⁷ The CWA Section 404(b)(1) guidelines describe permittees' obligations to follow the "mitigation hierarchy" when designing projects, to first avoid and then minimize any impacts to aquatic resources.⁸ The Army Corps is primarily responsible for carrying out the Section 404 permitting program. For unavoidable impacts, permittees must compensate or offset any losses, which is further described in the 2008 Compensatory Mitigation Rule (2008 Rule).⁹ The 2008 Rule articulates a preference of compensatory methods that prioritizes purchase of qualifying credits from a mitigation bank, then use of an in-lieu fee program (if no bank credits are available), and then "permittee-responsible mitigation" (PRM) project, which means a permittee designing

2 US Environmental Protection Agency. [National Summary of State Information](#).

3 Dahl, T.E. 2011. [Status and Trends of Wetlands in the Coterminous United States 2004-2009](#). USFWS.

4 EPA Office of Inspector General, 2014. [EPA Needs to Clarify Its Claim of "No Net Loss" of Wetlands](#). Report No. 14-P-0191.

5 Ibid. EPA Office of Inspector General, 2014.

6 National Research Council, 2001. [Compensating for Wetland Losses Under the Clean Water Act](#). Washington, DC: The National Academies Press.

7 Ibid. National Research Council, 2001.

8 [Compensatory Mitigation for Losses of Aquatic Resources under CWA Section 404 \(Final Rule\)](#) aka 2008 Rule, 33 CFR 325 & 332 and 40 CFR 230

9 Ibid. 2008 Rule.

their own mitigation project (Box 2). The 2008 Rule also requires all mitigation methods are held to equivalent standards and requirements.

Box 2. Compensatory Mitigation Methods, in Order of Preference of the 2008 Rule

Mitigation bank: A site, or suite of sites, where resources are restored, established, enhanced, and/or preserved to provide offsets for future impacts. In general, a mitigation bank sells credits to project developers whose obligation to provide compensatory mitigation is then transferred to the mitigation bank sponsor who takes on a perpetual obligation to maintain the resources. A credit is a defined unit of environmental goods or services that can be applied toward compliance with a permit, or held, traded, sold, or retired.

In-lieu fee program: A third party collects and administers fees from project developers causing negative impacts, which are used to pay for projects that compensate for the resource loss. Compensatory projects are often carried out after the negative impacts have occurred. The 2008 Compensatory Mitigation Rule requires a nonprofit or a state government to manage an in-lieu fee program.

Permittee-responsible mitigation: Offsetting projects or activities conducted by the project developer themselves or by a subcontractor, which usually take place concurrently with or after the project creating negative impacts.¹⁰

Considered among the best compensatory mitigation policies in the world, the 2008 Rule spurred private investment in wetland and stream protection and restoration and helped to create by far the largest ecological credit market in the US.¹¹ It is a significant contributor to the ecological restoration industry across the country that directly employs 126,000 people and generates \$9.5 billion in annual sales, and indirectly supports another 95,000 jobs and \$15 billion in indirect economic output.¹² To compare this with other domestic resource-intensive industries, iron and steel mills employ 91,000 people, coal mining employs 79,000, and logging employs 54,000. Jobs in the ecological restoration industry are often in rural and economically depressed areas and have wages higher than local averages.¹³

Challenges Facing Wetland and Stream Mitigation

The mitigation credit market and much of the ecological restoration industry exist because of the CWA, its implementing regulations and enforcement, and the nation's goal to achieve no net loss of aquatic resources (creating a quantitative target).¹⁴ No other federal policy sets as clear a standard on how impacts to resources should be offset. However, two significant challenges face the wetland and stream mitigation market under the Section 404 regulatory program.

First, while mitigation banks are considered the best type of offset for achieving high-quality and lasting conservation, they can be undercut by cheaper and less ecologically effective options that do not require successful completion of mitigation projects before being allowed to offset impacts. This often happens due to lax implementation of the preference of mitigation methods in the 2008 Rule (Box 2) on a regional or case-by-case basis. This undercuts an approach that otherwise provides a steady price signal and demand for effective environmental offsets. Some Corps

¹⁰ Definitions based on: Bennett, et al., 2017. [State of Biodiversity Mitigation 2017](#). Ecosystem Marketplace. Washington, DC.

¹¹ Ibid. Bennet et al., 2017.

¹² BenDor et al., 2015. [Estimating the Size and Impact of the Ecological Restoration Economy](#).

¹³ Davis E.J., et al., 2011. [The Economic Impacts of Oregon's South Coast Restoration Industry](#); Shropshire, R. & Wagner B., 2009. [An Estimation of the Economic Impacts of Restoration in Montana](#); Weinerman M., et al., 2012. [Socioeconomic Benefits of the Fischer Slough Restoration Project](#). Prepared for TNC and NOAA.

¹⁴ US Environmental Protection Agency. (2002, December 24). [National Wetlands Mitigation Action Plan. Federal Guidance for the Establishment, Use and Operation of Mitigation Banks](#). 60 FR 58605. (Nov 28 1995)

Districts have allowed new procedural steps or inconsistent application of Corps regulation and guidance to stymie bank approvals. Funding for personnel to conduct reviews is also a problem.

The second challenge is the ever-changing definition of the waters of the US (WOTUS), which defines the extent of protection under the Clean Water Act. A pair of Supreme Court decisions in 2001¹⁵ and 2006¹⁶ muddied the jurisdictional scope of the CWA's provision that protects wetlands, streams, rivers, and lakes. The Obama administration promulgated the Clean Water Rule (CWR) in 2015 to define what constitutes WOTUS.¹⁷ That rule was repealed in October 2019¹⁸ and replaced with the Trump administration's Navigable Waters Protection Rule effective on June 22, 2020, considered the most significant rollback of the jurisdictional scope of the CWA since its passage almost 50 years ago.¹⁹ The Biden administration repealed the 2020 rule, and proposed temporarily adopting the 1986 definition of WOTUS, which includes waters that are relatively permanent and/or have a significant nexus to navigable waters.²⁰ Importantly, the 1986 definition does not explicitly cover intermittent and ephemeral tributaries, as they are not "relatively permanent" and are unlikely to meet the "significant nexus" standard of "significantly affect[ing] the chemical, physical, or biological integrity of traditional navigable waters, interstate waters, or the territorial seas."²¹ This decision is significant, as the EPA has found that "Ephemeral and intermittent streams make up approximately 59% of all streams in the United States (excluding Alaska), and over 81% in the arid and semi-arid Southwest."²² Keeping this 1986 WOTUS definition excludes all of these waters from CWA protection and also removes the catalyst for stream mitigation.

There could be a drastic reduction in federal protections of aquatic resources if the Supreme Court rules in favor of Sackett.

The Supreme Court is also reviewing "the proper test for determining whether wetlands are [WOTUS]" in *Sackett v. EPA*, so it remains to be seen whether the court will keep to the current tests of relatively permanent and significant nexus or choose a different test.²³ The test preferred by the petitioner in the case is the "test set forth in [Justice Scalia's] *Rapanos* plurality opinion," which includes only navigable waters and wetlands with continuous surface water connections to navigable waters.²⁴ There could be a drastic reduction in federal protections of aquatic resources if the Supreme Court rules in favor of *Sackett*: no non-adjacent wetlands without surface water connection to navigable waters, no intermittent or ephemeral wetlands, and no isolated wetlands would be considered WOTUS. The Supreme Court could leave interpretation on how the *Rapanos* test is adopted to the EPA and USACE. As well, a reduction in protections does not necessarily mean an equivalent impact on aquatic resources (e.g., unprotected intermittent streams may be in areas with low likelihood of development).

After an inevitable flurry of lawsuits, states could "fill in the gaps" and strengthen state level laws, whereas other states cannot by law exceed federal protections. This would lead to a patchwork of stronger and weaker protections and could kill demand for producing aquatic restoration in advance of impacts in states with weak protections. However, this may not come to pass. Twenty-six amicus briefs²⁵ have been filed by groups supporting and opposing the petitioner's suggested change of WOTUS, including industrial, agricultural, and developer groups, States, members of

15 *Solid Waste Agency of Northern Cook County (SWANCC) v. US Army Corps of Engineers*, 531 US 159 (2001).

16 *Rapanos v. United States*, 547 US 715 (2006).

17 *Clean Water Rule: Definition of "Waters of the United States"*, 80 FR 37053. (2015, June 29).

18 US Environmental Protection Agency. [WOTUS Step One - Repeal](#).

19 *The Navigable Waters Protection Rule: Definition of "Waters of the United States"* 85 FR 22250. (2020, April 21).

20 *Revised Definition of "Waters of the United States"* 86 FR 69372. (2021, December 7).

21 *Ibid.* Revised Definition of "Waters of the United States."

22 US EPA, 2008. [The Ecological and Hydrological Significance of Ephemeral and Intermittent Streams in the Arid and Semi-arid American Southwest](#).

23 Inside EPA. (2022, January 4). [High Court Again Wades Into Debate Over Water Act's WOTUS Definition](#).

24 [Sackett vs. EPA](#)

25 An amicus curiae brief refers to an individual or group who is not directly involved in, but has a strong interest in the case and petitions the court "for permission to submit a brief in the action intending to influence the court's decision" ([Legal Information Institute](#)).

Congress (including a group of 167 members critical of the case²⁶), and environmental groups.²⁷ The case will be heard in October of 2022.²⁸

Overall, there is uncertainty in how anticipated regulation and court decisions (not to mention future court challenges) will affect the extent of waters and wetlands across the US, with implications for the public (i.e., loss of the benefits derived from wetlands) and individuals and organizations involved in compensatory mitigation of wetlands and streams.

Water Quality Trading

The EPA publishes water quality criteria under Section 304(a) of the CWA. States with water bodies that do not meet water quality standards are required to set a Total Maximum Daily Load (TMDL) for each water body, which determines the maximum amount of a pollutant that can be present in the water while still staying within water quality standards. States are responsible for developing and submitting TMDLs to the EPA for approval. Federally recognized tribes, through the Treatment as a State (TAS)²⁹ provision of the CWA, can also set water quality standards and TMDLs, as well as assume permitting authority.

In 2003, the EPA released a water quality trading policy to encourage the use of reductions in nutrient pollution in different areas of a watershed to help point sources elsewhere in the watershed to achieve reductions in nutrient discharges in ways that deliver more co-benefits.³⁰ Since then, the EPA, the United States Department of Agriculture (USDA), other federal agencies, states, and many other stakeholders have contributed time, money, energy, and

26 BRIEF OF AMICI CURIAE 167 U.S. MEMBERS OF CONGRESS IN SUPPORT OF RESPONDENTS. June 17, 2022.

27 Found in [list of Sackett vs. EPA files](#)

28 Supreme Court oral argument calendar for the 2022-2023 term. Released June 14, 2022.

29 US EPA. (2021, September 2). [Tribal Assumption of Federal Laws - Treatment as a State \(TAS\)](#)

30 [Water Quality Trading Policy; Issuance of Final Policy](#), 68 Fed. Reg. 1608. (2003, January 13).

Photo credit: Chesapeake Bay Program, Sediment in Hampshire County WV; <https://www.flickr.com/photos/chesbayprogram/51098124488/in/gallery-69138254@N03-72157720864426232/>, CC BY-NC 2.0.



thought leadership to promote water quality trading programs and watershed-scale initiatives. In 2018, the EPA and USDA issued a joint statement saying that the departments will work together to increase collaborative approaches.³¹ In 2019, the EPA issued a second memo that strengthened and simplified the first.³² Although they did not transform earlier policy, the memos are important for providing additional guidance to states, tribes, and stakeholders regarding the use of market-based programs to reduce pollution. Instead of focusing exclusively on one contributing source of pollution, water quality trading enables states to consider other, often nonregulated, contributing sources, and to authorize a more cost-effective distribution of strategies to reduce pollutant loads, or strategies with more co-benefits. In these policy statements, the EPA provided guidance for when trading may occur and defined elements of trading programs.

However, there has been a lack of broad demand for credits. Reasons for lack of adoption include general inertia and preference for gray infrastructure (“the way it’s always been done”) over green infrastructure, States expressing regulatory uncertainty of their ability to use water quality credits, a lack of widely approved predictable standards for crediting and debiting, a lack of clarity on whether credits can be banked for later use, and a lack of developed discharge limits for nutrients from many polluted water bodies.³³

In April 2022, the EPA released a memo on Accelerating Nutrient Reductions that included actions salient to water quality trading.³⁴ In the memo, the EPA announced they would:

- “Finalize a policy statement on flexibilities for implementing market-based approaches within the NPDES permit program.”
- “Initiate rulemaking to explicitly state that NPDES permits may include conditions allowing market-based approaches, including trading, to meet applicable effluent limits.”
- “Support states to employ a variety of permitting approaches, including watershed-based permitting, integrated planning, adaptive management, and various market-based approaches including trading and offsets.”
- “Work with states and EPA regional permitting authorities as they write water quality-based permit limits to meet water quality standards, including those that implement TMDLs. We will ensure that both EPA and state-issued permits... incorporate technically sound nutrient limits when necessary...”

If implemented, these actions could address impediments and help water quality trading reflect the characteristics of mitigation banking under Section 404. With regards to the first two bullets above, the EPA should broaden the policy statement and rule making to include both market-based approaches and other collaborative watershed-based approaches to allow ongoing innovation in this space.³⁵ Additionally, we recommend the EPA fund consistent enforcement of permits, create guidance to clarify how cities, utilities, and other stakeholders can design and implement water quality projects before regulation establishing numeric limits on pollutants. Our recommendations intend to provide direction for how to execute water quality projects in the near term, given that regulatory limits will take considerable time to establish and implement.

Our recommendations intend to provide direction for how to execute water quality projects in the near term.

31 US Environmental Protection Agency Press Office. (2018, December 4). [EPA and USDA Encourage Use of Market-based and Other Collaborative Approaches to Address Excess Nutrients](#) [Press release].

32 EPA, 2019. [EPA Assistant Administrator for Water's Memorandum](#) dated February 6, 2019

33 Durand, B., personal communication, June 2022; US Government Accountability Office. (2017, October). GAO-18-84 [Report to the Honorable Sheldon Whitehouse, US Senate](#). Washington, D.C.; Willamette Partnership, 2018. Ibid.

34 EPA, 2022. [Accelerating Nutrient Pollution Reductions in the Nation's Waters](#).

35 Huntley and Durand, 2022. Blog: [An EPIC Response to EPA's Nutrient Pollution Memo](#). April 18, 2022.

Recommendations to Improve Mitigation Rules and Practices under the CWA

Table 2 below provides a high-level view of the recommendations, indicating the type of change and the near or long-term timeframe.

Table 2. Clean Water Act Recommendations

Clean Water Act	Policy Change	Implementation	Act of Congress	R&D	Big Asks
Highlight Immediate and Long-term as subheaders somehow					
Include clarification about intermittent and ephemeral tributaries in the anticipated second rulemaking process	X				
Increase resources and set metrics that hold the Army Corps accountable for ensuring mitigation targets are met and Section 404 is fully enforced.		X			
Ensure mitigation credits are tied to ecological performance.		X			
Long-term					
Clarify federal guidance on water quality trading and collaborative watershed approaches.		X			
Create a federal advanced mitigation fund for water quality to help plan for compensatory mitigation needs over the long term.					X
Incentivize the removal of hazardous dams.		X			
Invest in research for quantifying and rewarding additional ecosystem services that result from mitigation projects under the CWA.				X	

Immediate Recommendations

1. Refine WOTUS

The Biden administration has already successfully repealed the Navigable Waters Protection Rule and proposed a return of the extent of Clean Water Act protections to the 1986 definition of WOTUS, which includes waters that are relatively permanent and have a significant nexus to navigable waters.³⁶ The EPA anticipates “a second rulemaking process that further refines and builds upon that [1986] regulatory foundation.”³⁷ This second rulemaking could include clarification about whether WOTUS includes intermittent and ephemeral tributaries, which as noted above, are currently not covered in the 1986 definition of WOTUS.

We recommend that the EPA administrator and the secretary of the Army:

- Include clarification about intermittent and ephemeral tributaries in the anticipated second rulemaking process.³⁸

2. Increase resources and set metrics that hold the Army Corps accountable for fulfillment of mitigation targets and full enforcement of Section 404.

The supply of available mitigation banking credits should keep pace with or exceed the demand from development projects. This is happening in some Corps Districts, but not in many others because Section 404 and the mitigation rule are not consistently implemented across Districts. In particular, District offices largely have not been held accountable for ensuring permitting outcomes meet mitigation program requirements, including the mitigation methods preference hierarchy. This lack of accountability results in weaker conservation outcomes and leaves permitted development more likely to contribute to the net deterioration of water resources. We recommend the following actions:

- Increase the annual budget for the Army Corps’ Regulatory Program to at least \$250 million and direct that increased funding toward hiring additional project managers, mitigation leads, training, and a mentorship program on mitigation review and oversight. The budget has been largely stagnant at \$200–\$210 million for the past 15 years.
- The assistant secretary of the Army (Civil Works) should act to ensure that Army Corps districts consistently implement the preference hierarchy in the 2008 Rule. This should include guidance on ways that districts should standardize various types of mitigation paperwork requirements, like standard easement language, credit release schedules, and roles of interagency review teams in bank, in-lieu fee, and permittee responsible project review.
- Establish clear job performance metrics against which Army Corps staff will be evaluated to ensure that staff prioritizes efficient mitigation banking reviews and decisions. This will help to address the backlog of proposed bank projects. The Army Corps has already included the time to permit mitigation banks as a new performance metric for the Office of Management and Budget (OMB) to track the program—continue this and publicly track it in a database or dashboard that is updated throughout the year.

³⁶ [Revised Definition of “Waters of the United States”](#) 86 FR 69372. (2021, December 7).

³⁷ EPA. (2021, June 9). [Webpage - Revising the Definition of “Waters of the United States.”](#)

³⁸ *Ibid.* [Revised Definition of “Waters of the United States”](#)

- Continue to ensure transparency on permit availability, as it provides more stability for bank developers seeking to provide mitigation offsets. Recent updates to the Regulatory In-Lieu Fee and Bank Information Tracking System database have been helpful to permitting entities, specifically the added information on why a given feature is in a jurisdiction, where wetlands are located, and offset approaches used.³⁹ Also, the creation of a more easily searchable national permitting database that includes water quality and species habitat credits allows developers to find projects in a service area of interest rather than having to use requests under the Freedom of Information Act.⁴⁰
- The Army Corps' Regulatory Program standard operating procedures specify that a maximum of 25 percent of an Army Corps District's regulatory budget can be spent on enforcement.⁴¹ We recommend the Army Corps immediately amend these standard operating procedures to either increase the budget cap of enforcement or fund enforcement on an as-needed basis.

39 USACE, 2022. [Regulatory In-Lieu Fee and Bank Information Tracking System](#).

40 USACE, 2022. [USACE permit finder](#).

41 National Research Council, 2001. "[Appendix G Army Corps of Engineers Standard Operating Procedures for the Regulatory Program](#)." Chapter within *Compensating for Wetland Losses Under the Clean Water Act*. Washington, DC: The National Academies Press. doi: 10.17226/10134.

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Long-Term Recommendations

1. Create clearer federal guidance on water quality trading programs and collaborative watershed approaches.

The process for setting up water quality trading programs has been made more complicated than it needs to be. Several groups have issued how-to guides that are often case-specific or regional in focus, including the National Network on Water Quality Trading and EPIC / Sand County Foundation's Watershed Partnerships Guide.^{42 43} More federal-level guidance is needed to provide practical advice on how to arrange functional, scalable programs:

- The Water Quality Trading Toolkit for Permit Writers should be updated.⁴⁴ The EPA should also create case studies illustrating successes and challenges in water quality trading and collaborative watershed approaches that can be applied across a range of contexts.
- The EPA should implement the actions announced in the April 2022 memo on Accelerating Nutrient Reductions.⁴⁵ These actions include policy and rulemaking that make clear that water quality trading can be used while keeping open other collaborative watershed-based approaches to allow ongoing innovation in this space.
- Working with the Council of Environmental Quality's (CEQ) Office of Environmental Justice, the EPA should encourage and guide states on how to design water quality trading programs to incentivize water quality improvements in areas that will benefit the most vulnerable communities, particularly those with a history of environmental justice burdens. For example, models can incentivize clean-water investments to benefit vulnerable areas where water quality issues are most severe. Communities may not be aware that water quality trading and other watershed partnerships can meet regulations at lower costs than gray infrastructure. Sand County Foundation has identified examples of cost savings in Broadhead, Wisconsin; Grafton, Wisconsin; Ames, Iowa.⁴⁶ CEQ and EPA should also consider issuing guidance or revising funding programs to allow federal payments to supplement local financing where co-benefits like environmental justice outcomes create additional costs in project design, construction, or maintenance for projects that would otherwise fall on wastewater utilities or other credit buyers.
- The EPA should accelerate work with states to set numeric nutrient criteria. For priority watersheds that do not yet have numeric nutrient criteria, the EPA should support establishing a "zero year," after which any entities delivering and documenting quantitative improvements in water quality are assured that those improvements will always be countable or tradable under any future quantitative TMDL. Doing so would incentivize early action to improve water quality, knowing that projects would always be fairly credited and not be depreciated over time.

More federal-level guidance is needed to provide practical advice on how to arrange functional, scalable programs.

42 National Network on Water Quality Trading, 2018. [Breaking Down Barriers: Priority Actions for Advancing Water Quality Trading](#).

43 Sand County Foundation, EPIC, and Great Lakes Regional Center, 2022. [Municipal-Agricultural Watershed Partnerships Project Guide](#).

44 EPA, 2003. [Water Quality Trading Toolkit for Permit Writers](#).

45 EPA, 2022. [Accelerating Nutrient Pollution Reductions in the Nation's Waters](#).

46 Sand County Foundation, 2022. [Municipal-Agricultural Watershed Partnerships](#).

- State water quality trading programs benefit from collaboration with EPA staff who have local knowledge. Specialized EPA regional staff with water quality trading expertise should be hired to provide “circuit rider” expertise to help states address any challenges in implementing trading and watershed-based programs to offset point source impacts.
- The EPA and the US Department of Agriculture should launch a joint initiative that supports the use of existing quantification tools that estimate the nutrient pollution reduction benefits of best management practices. For an example of how a quantification tool could be enabled in legislation, see H.R. 6182 “The Farmer Driven Conservation Outcomes Act.”⁴⁷ Specifically, the EPA and states should allow the use of these tools to track progress toward water quality goals and facilitate transactions for projects. This effort should also focus on making the use of these tools easier for watershed groups, farmers, and investor-backed efforts. This has already been attempted for climate change mitigation with the Growing Climate Solutions Now Act of 2021, which creates direction for the USDA to accept numerous carbon tracking methodologies and establish a certification process for experts who provide quantification services. The EPA and USDA can do the same thing for nutrients without legislation.

2. Create a federal advanced mitigation floor price revolving fund.

Mitigation is currently funded and implemented on a project-by-project basis, which works well in geographies with predictable and somewhat consistent demand, but less so when mitigation requirements (i.e., regulatory requirements like TMDLs) remain speculative or where future demand is unclear. One way to address this is by creating a federal mitigation fund used to contract for the acquisition of Section 304 or Section 404 credits with two conditions: 1) contracts for credits are not paid until 5–10 years after contracts are signed, and 2) contractors can void the contract without penalty before any payment occurs to sell credits to another buyer (or for any other reason). Congressional action would be needed to clarify that obligated funds for contracts that are eventually canceled go into a dedicated or revolving fund to cover more contracts in the future.

Mitigation funded and implemented on a project-by-project basis doesn't work well when those requirements remain speculative.

Why do this? Consider the risks to a conservation investor or conservation organization that believes a numeric nutrient pollution limit on phosphorus will be established in a watershed without one. If they pay for a wetland restoration and protection project in advance of the regulatory change and then no change is made, the value of their asset goes to zero—no one will buy it. However, with a government contract in place to buy the restored asset at a specific price in the future, the asset value might be lower than projected but it won't go to zero (i.e., it won't end up as a stranded asset). This should have the effect both of stimulating early investment in offsets and of making it easier to develop strategies to meet regulatory requirements. From a taxpayer's perspective, if the restoration practitioner terminates a contract early because they found another buyer, then obligated funding is never spent and a restored wetland or stream or enhanced water quality has still been achieved. For a permittee or a state, it helps guarantee there is an available supply of development offsets to meet future regulatory needs.

3. Incentivize the removal of hazardous dams.

The American Society of Civil Engineers gives US dam infrastructure a D grade, noting that 17 percent of the over 90,000 dams in the US are high-hazard potential.⁴⁸ Dam removal can be less expensive than repair or replacement

⁴⁷ H.R.6182 - [Farmer-Driven Conservation Outcomes Act of 2020](#).

⁴⁸ American Society of Civil Engineers. (2017). [2017 Infrastructure Report Card: Dams](#).

and can also provide significant habitat benefits.⁴⁹ A market is needed that incentivizes the removal of high-hazard dams that endanger nearby communities or dams that impede access to critical habitat for endangered fish species. The Army Corps should make this a priority by drafting District-level standard operating procedures to promote the wider implementation of Regulatory Guidance Letter 18-01 on the Determination of Compensatory Mitigation Credits for the Removal of Obsolete Dams and Other Structures from Rivers and Streams.⁵⁰ This regulatory guidance letter defines factors to consider when determining the amount of mitigation credit generated from the removal of obsolete dams or other structures as well as recommendations for quantifying mitigation credits. It should be clear to any project proponent that offsetting impacts to artificial wetlands behind the dam is not required if the outcome is a return to a more natural flow regime and ecosystem upstream and downstream of the structure. The Army Corps should also conduct training and workshops on dam removal.

4. Move beyond the morass of ‘stacking’ additional ecosystem services

Over the last decade, significant research has gone into the largely theoretical discussion of ‘stacking’ ecosystem services, which we define as selling more than one compliance-grade credit from the same land.⁵¹ Early research analyzed opportunities for landowners that needed additional financial incentives for restoration and conservation,

49 Walls, A. & Gonzales, V. (2020, October 22). [Dismantling Dams Can Help Address US Infrastructure Problems](#). Resources for the Future. Washington, D.C.

50 US Army Corps of Engineers. (2018, September 25). [Regulatory Guidance Letter No. 18-01: Determination of Compensatory Mitigation Credits for the Removal of Obsolete Dams and Other Structures from Rivers and Streams](#).

51 See LaRocco and Deal, 2011, [Giving Credit Where Credit is Due: Increasing Landowner Compensation for Ecosystem Services](#); Madsen et al., 2012, [Offset Credit Stacking](#); Cooley and Olander, 2012, [Stacking Ecosystem Services Payment: Risks and Solutions](#); Gardner and Fox, 2013, [The Legal Status of Environmental Credit Stacking](#); Robertson et al., 2014, [Stacking Ecosystem Services](#); vonHase and Cassin, 2018, [Theory and Practice of ‘Stacking’ and ‘Bundling’ Ecosystem Goods and Services: A Resource Paper](#)

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legal barriers and opportunities, and principles such as ‘additionality’ (proving that a project has benefits beyond an existing baseline). To date, no compliance-grade credit stacking has occurred.⁵² There are a few areas that could move the credit stacking conversation out of a theoretical morass and into productive action.

The first area is acknowledging that what is impractical today could be needed in the future. Today, creating and selling just one credit requires identifying a Venn diagram sweet spot of sufficient unmet demand for credits to be economically viable to develop, law or policy that allows crediting, and implementation of that policy. Creating and selling more than one compliance-worthy credit multiplies this challenge.

There may be a time in the future, however, when there is diminished supply and what was once a challenge becomes practicable. For example, conversation in the Chesapeake Bay had simmered for over a decade about the largely theoretical idea of water quality trading across state lines. In 2022, diminished opportunities for nutrient reductions in the state of Maryland catalyzed policy language to officially allow interstate trading of water quality credits.⁵³

There are a few areas that could move the credit stacking conversation out of a theoretical morass and into productive action.

A second opportunity to move beyond the morass of stacking is to consider that the 2008 Rules on compensatory mitigation in reality focus on aquatic outcomes (hydrology primarily, and water quality⁵⁴) and benefits like biodiversity or carbon sequestration could be considered additional to the primary outcomes. Although wetlands are defined under the 2008 Rules holistically to incorporate physical, chemical, and biological characteristics or functions, in practicality regulators approve compensatory mitigation projects heavily skewed towards water-related performance indicators. It should not be a surprise then that mitigation is heavy on hydrologic restoration as opposed to biological restoration. Provisioning of biodiversity, carbon sequestration, or other ecosystem services from aquatic restoration is a happy coincidence and certainly is not incentivized or optimized under wetland and stream restoration as we know it. Consider a hypothetical future where it is acknowledged that Section 404 permittees are not buying biodiversity or carbon, and therefore other ecological benefits could meet the principle of additionality. This would require a change in law that would clarify that a compensatory mitigation provider could create and sell (retire) a CWA 404 wetland or stream credit but retain the right to sell any other ecological uplift from the restoration, given that the project had established and disclosed the condition of other ecological characteristics, could establish the uplift gained, and retains the aquatic outcomes already sold under Section 404. The Biden administration should lay the groundwork by allocating funds for the EPA and Army Corps to provide research grants to create a more standardized measurement system for additional ecosystem services on bank, in-lieu fee, and permittee-responsible mitigation sites. There is some movement in policy to establish the ability for a landowner to receive multiple payments for environmental services. For example, the 2022 Maryland Conservation Finance Act allows a participant in a state cost share program to receive payment for additional conservation benefits:

The Department may not prohibit or limit, through any cost-share agreement, a participant in the cost sharing program established under this subtitle from participating in and receiving compensation from greenhouse gas markets, carbon credits, or soil carbon programs, if the purpose of the compensation is to achieve additional conservation benefits that are consistent with the state’s Chesapeake Bay conservation goals.⁵⁵

52 One exception was a nutrient credit and wetland credit sold off the same land in North Carolina that provided no additionality and was subsequently prohibited (Kenny, 2009, “[When is Credit Stacking a Double-Dip?](#)”). Other studies point out “joint” mitigation banks which allow the sale of either a wetland credit or a species credit, which does not fall within our definition of stacking.

53 [Maryland Conservation Finance Act](#), SB 348. March 24, 2022.

54 Or in the parlance of the 2008 Rule, physical and chemical processes of aquatic functions. 2008 Rule, *Ibid*.

“The Department may not prohibit or limit, through any cost-share agreement, a participant in the cost sharing program established under this subtitle from participating in and receiving compensation from greenhouse gas markets, carbon credits, or soil carbon programs, if the purpose of the compensation is to achieve additional conservation benefits that are consistent with the state’s Chesapeake Bay conservation goals.”⁵⁵

Wealthy landowners frequently gain multiple revenue streams from the same land - tax breaks, crops, hunting leases, and incentive payments. Why shouldn’t environmental programs also consider opportunities for multiple payments, based upon delivery of multiple benefits?

55 Ibid. [Maryland Conservation Finance Act](#).

Photo credit: Allegra Wrocklage, EPIC.



Conclusion

Mitigation programs developed under the Clean Water Act are some of the most robust in the US and in the world. However, more clarity is needed to provide project developers the certainty they need regarding when and how credits will be recognized, where projects should be prioritized and that incentives will support a market for credit demand. A durable WOTUS definition, more robust water quality trading guidance and specific guidance for dam removals will all support the expansion of a market for buyers and sellers of mitigation credits. If implemented, these recommendations will ultimately ensure fewer impacts go unmitigated, and that high quality offsets are developed in advance of impacts.

Photo credit: Allegra Wrocklage, EPIC.

