



April 3, 2019

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Andrew Wheeler, Administrator  
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Mr. R.D. James, Assistant Secretary for the Army  
Civil Works U.S. Army Corps of Engineers  
HQ 441 G Street, NW  
Washington, DC 20314-1000

Regarding: Waters of the US Rulemaking. Docket ID No. EPA-HQ-OW-2018-0149

Administrator Wheeler and Assistant Secretary James,

The Cahaba River Society is a 501c3 organization in central Alabama with a mission to restore and protect the Cahaba River watershed and its rich diversity of life. The diverse lives depending on the Cahaba include the people of central Alabama who rely on the river for drinking water as well as its globally-significant diversity of freshwater wildlife.

We do not support adoption of the Revised Definition of “Waters of the United States” (the Proposed Rule <sup>1</sup>). The Proposed Rule is an unprecedented rollback of protections for our Nation’s waters with no scientific underpinning nor legal justification. Our chief concerns are listed here, and we elaborate on those concerns below:

- The overall health of our Nation’s Rivers and Streams is currently poor. The Proposed Rule would worsen this problem.
- The EPA’s and the Army Corps’ deliberation about the Proposed Rule disregards the extensive scientific body of information developed for the 2015 Clean Water Rule.
- The Proposed Rule dramatically contracts which waters and wetlands will be protected by the Clean Water Act, excluding vital water resources that have traditionally been protected, and will contribute to confusion over

<sup>1</sup> [https://www.epa.gov/sites/production/files/2019-02/documents/revised\\_definition\\_of\\_waters\\_of\\_the\\_united\\_states.pdf](https://www.epa.gov/sites/production/files/2019-02/documents/revised_definition_of_waters_of_the_united_states.pdf)

'jurisdiction by rule'. MS4s' stormwater management would become more complicated and uncertain under the Proposed Rule.

- Contraction of the WOTUS definition will not yield an economic benefit for the Nation and will result in higher costs for drinking water and water quality restoration.
- The Proposed Rule disregards the public comments submitted for the 2015 Clean Water Rule.
- The Proposed Rule imperils drinking water quality, supply, and cost for Alabamians who rely on having a clean, healthy drinking water, by excluding all ephemeral and potentially some or all intermittent streams that are headwaters of surface drinking water sources, such as the Cahaba River.
- The Proposed Rule assumes that groundwater does not influence surface water quality. For the Cahaba (and most other streams), this is a grave error that will result in significant degradation of the nation's waters.
- The WOTUS definition should not be limited to only perennially flowing streams.
- Advocates for the Proposed Rule make misleading claims that distort understanding of science, costs and benefits.
- The Proposed Rule would encourage **significant** loss of wetlands that now serve vital water supply and flood-prevention functions.

**The overall health of our Nation's Rivers and Streams is currently poor. The Proposed Rule would worsen this problem.**

The goal of the Clean Water Act is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters". It is important to reference this fact because the Proposed Rule does not serve that goal. Unfortunately, the Proposed Rule would, if adopted, result in progressively degraded water quality in the Nation's waters.

In March of 2016, the EPA published *The National Rivers and Streams Assessment 2008/2009*<sup>2</sup>. This was a survey of 1.2 million miles of U.S. rivers and streams. That assessment showed that "46% of our nation's rivers and streams are in poor biological condition, with 25% in fair condition and 28% in good condition." Over 40% of our streams have levels of nutrients that are too high. About 24% do not have healthy riparian vegetation and 15%, including our Cahaba River, have excessive sediment pollution that damages aquatic wildlife and increases the cost to treat drinking water, among other impacts. Compared to an earlier *2004 Wadeable Streams Assessment*, these sad statistics are getting worse over time. From almost everyone's perspective, these numbers are not satisfactory.

It is unreasonable to expect improvement in the health of our Nation's waters if we cut back on the number and types of waters that will be protected by the Clean Water Act.

Given that **only 28%** of the nation's waters were found to be in good condition, withdrawal of Clean Water Act protections from all ephemeral streams (which are at least 18% of all river and stream miles in the U.S.), potentially some or all intermittent streams (which are at least 52% of all river

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<sup>2</sup> U.S. Environmental Protection Agency. Office of Water and Office of Research & Development. *National Rivers and Streams Assessment 2008/2009: A Collaborative Survey (EPA/841/R-16/007)*. Washington, DC. March 2016. Available at <https://www.epa.gov/national-aquatic-resource-surveys/nrsa> .

and stream miles in the U.S.)<sup>3</sup>, and about half of the nation's wetlands, would only make the current inadequate condition of our Nation's waters worse. Proponents of the Proposed Rule have not explained how it will help advance the goals of the Clean Water Act.

The health of our nation's rivers, streams, and wetlands has already been compromised too far. Rather than decreasing the scope of waters protected under the Clean Water Act, as the Proposed Rule would do, we should be focusing on ways to improve the physical, chemical, and biological integrity of these critical resources.

The Cahaba River is well known for its rich biodiversity. One of our local drinking water providers, the Birmingham Water Works Board, describes the Cahaba River as an irreplaceable source water supply for drinking water. Nevertheless, water quality is impaired for over one hundred miles of length of the Cahaba River mainstem (this does not include over 140 miles of impaired Cahaba tributaries and the 961 acres of Lake Purdy impaired for excessive mercury) due to excessive sediment and habitat alteration, excessive nutrients, and excessive pathogens. Further degradation of the Cahaba River risks the quality, availability, and cost of our drinking water. More on that concern is described below.

### **The EPA's and the Army Corps' deliberation about the Proposed Rule disregards the extensive scientific body of information developed for the 2015 Clean Water Rule.**

The scientific information submitted for the 2015 WOTUS Rule deliberation is directly applicable in evaluating this Proposed Rule and should be carefully reviewed. Over 1,200 peer-reviewed scientific studies were assessed by a Scientific Advisory Board. In October of 2014, that Scientific Advisory Board produced a report entitled Connectivity of Streams & Wetlands to Downstream Waters: A Review & Synthesis of the Scientific Evidence<sup>4</sup> (hereafter referred to as the 'Connectivity Report'). The body of scientific information submitted for deliberation about the 2015 Rule and the Connectivity Report provided a solid foundation and explanation of the 'connectedness' of our waterways and our groundwater resources. The Connectivity Report and other scientific information submitted for the 2015 Rule review should be included in the deliberations about adoption of the current Proposed Rule. Failure to consider that critical scientific information will result in a flawed decision.

The Connectivity Report reached at least five major conclusions which have apparently been ignored in the development of the Proposed Rule. An abbreviated version of those conclusions are:

- Conclusion 1 states (in part): *"The scientific literature unequivocally demonstrates that streams, individually and collectively, exert a strong influence on the integrity of downstream waters. All tributary streams, including perennial, intermittent, **and ephemeral** (emphasis added), are physically, chemically, and biologically connected to downstream rivers via channels and associated alluvial deposits where water and other materials are concentrated, mixed, transformed, and transported..."*

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<sup>3</sup> [https://www.sciencemag.org/news/2018/12/epa-claims-no-data-impact-weakening-water-rule-numbers-exist?r3f\\_986=https://www.google.com/](https://www.sciencemag.org/news/2018/12/epa-claims-no-data-impact-weakening-water-rule-numbers-exist?r3f_986=https://www.google.com/). We recognize that these estimates are provisional and are currently based on an incomplete National Hydrography Dataset. However, these were assembled by EPA and are the best available data.

<sup>4</sup> [https://cfpub.epa.gov/si/si\\_public\\_file\\_download.cfm?p\\_download\\_id=523020&Lab=NCEA](https://cfpub.epa.gov/si/si_public_file_download.cfm?p_download_id=523020&Lab=NCEA).

- Conclusion 2 states (in part): *“The literature clearly shows that wetlands and open waters in riparian areas and floodplains are physically, chemically, and biologically integrated with rivers via functions that improve downstream water quality, including the temporary storage and deposition of channel-forming sediment and woody debris, temporary storage of local ground water that supports baseflow in rivers, and transformation and transport of stored organic matter. Riparian/floodplain wetlands and open waters improve water quality through the assimilation, transformation, or sequestration of pollutants, including excess nutrients and chemical contaminants such as pesticides and metals, that can degrade downstream water integrity...”*
- Conclusion 3 states (in part): *“Wetlands and open waters in non-floodplain landscape settings (hereafter called “non-floodplain wetlands”) provide numerous functions that benefit downstream water integrity. These functions include storage of floodwater; recharge of ground water that sustains river baseflow; retention and transformation of nutrients, metals, and pesticides; export of organisms or reproductive propagules to downstream waters; and habitats needed for stream species...”*
- Conclusion 4 states (in part): *“Watersheds are integrated at multiple spatial and temporal scales by flows of surface water and ground water, transport and transformation of physical and chemical materials, and movements of organisms. Although all parts of a watershed are connected to some degree—by the hydrological cycle or dispersal of organisms, for example—the degree and downstream effects of those connections vary spatially and temporally, and are determined by characteristics of the physical, chemical, and biological environments and by human activities...”*
- Conclusion 5 states (in part): *“The incremental effects of individual streams and wetlands are cumulative across entire watersheds and therefore must be evaluated in context with other streams and wetlands. Downstream waters are the time-integrated result of all waters contributing to them...”*

Under the Proposed Rule, ephemeral streams would no longer be covered by the Clean Water Act despite the fact that the Connectivity Report has highlighted their vital significance in providing the clean water and clean drinking water for our nation. The Proposed Rule would no longer cover wetlands that do not have surface flow to other jurisdictional waters despite the fact that the Connectivity Report firmly established their significance, showing how important wetlands, even those that do not have obvious surface connections, are to the protection of the physical, chemical, and biological integrity of the nation’s waterways. Excluding wetlands from WOTUS due to a lack of demonstrable surface flow is arbitrary and simply not supported by the scientific literature.

The Connectivity Report emphasized the significance of non-floodplain wetlands in improving the hydrological response of the nation’s waters, treating, transforming, and minimizing the negative impacts of pollutants on our streams and in reducing the impacts of flooding. Unfortunately, the Proposed Rule would decrease the proportion of these important wetlands that are currently protected by as much as 50%. Wetlands, including non-floodplain and non-adjacent wetlands, are essential in our watershed to ameliorate flood peaks and to sustain flow during drought intervals. The Proposed Rule would allow the destruction of wetlands that currently function to minimize flooding and sustain flow during droughts. Without these wetlands, more people in the Cahaba watershed will experience more frequent and greater magnitude flooding and more frequent ‘no-flow’ conditions during drought intervals, with accompanying loss of drinking water supplies, which is becoming more frequent and extreme in the southeast.

Conclusion 5 of the Connectivity Report emphasizes how important it is to protect all streams, including ephemeral streams. The Proposed Rule would remove protections from ephemeral streams which are known to comprise around 18% or more of the total length of stream miles in the U.S. and are essential to surface drinking water supplies like the Cahaba River.

The Proposed Rule significantly ignores elements of each of the above Conclusions. In that regard, the Proposed Rule ignores sound science. In ignoring sound science, the EPA and the Army Corps are putting the health, welfare, economic security, and recreational enjoyment of the American public at risk.

**The Proposed Rule dramatically contracts which waters and wetlands will be protected by the Clean Water Act, excluding vital water resources that have traditionally been protected and will contribute to confusion over ‘jurisdiction by rule’. MS4s stormwater management would become more complicated and uncertain under the Proposed Rule.**

The Proposed Rule would withdraw all Clean Water Act protections from all ephemeral streams (which are at least 18% of all river and stream miles in the U.S.), potentially some or all intermittent streams (which are at least 52% of all river and stream miles in the U.S.), and about half of the nation’s wetlands.

The Connectivity Report notes this extremely important point:

***“...headwater streams, which are the smallest channels where streamflow begins, are the cumulative source of approximately 60% of the total mean annual flow to all northeastern streams and rivers.”<sup>5</sup>***

The authors of the Proposed Rule seem to assume that ephemeral and intermittent streamflow is somehow insignificant; being the source of 60% of the total mean annual flow ***is not insignificant!*** How can we withdraw Clean Water Protections from the sources of the majority of flow to traditionally navigable waters and not expect significant water quality degradation? The Proposed Rule is not a ‘careful realignment’ so much as it is a total abdication of the federal government’s responsibility to implement the Clean Water Act.

Our understanding is that the Proposed Rule would allow unregulated discharges to ephemeral streams ***even if those pollutants will subsequently reach traditional navigable waters.*** As described above, current environmental protection regulations and enforcement have not been adequately protective. How can the Agencies reasonably expect to maintain the current (inadequate) water quality conditions of our Nation’s waters while removing Clean Water Act protections from the headwater streams that supply ***60% of the mean annual flow to traditional navigable rivers and streams?*** We assert that it would be impossible to do so and that it is unwise to alter the approach established by the 2015 Clean Water Rule.

The 2015 Rule proposed objective, physical, observable field characteristics of headwaters (evidence of regular flow, an ordinary high water mark, and evidence of a bed and bank, for

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<sup>5</sup> See the Executive Summary, page ES-8, first paragraph on the page and on page 3-1.

example) and explicit distances of isolated wetlands from traditional navigable waters that allowed a person to determine which water features qualified as WOTUS. These were reasonably objective qualities which *clarified* which waters should be designated WOTUS.

Unfortunately, the Proposed Rule eliminates objective guidelines for defining WOTUS and will contribute to greater confusion about which waters should be considered WOTUS. Moreover, if the Proposed Rule is adopted, individual landowners would be responsible for determining if a given receiving water is jurisdictional. This includes the responsibility to determine whether or not a given stream eventually flows into a navigable water. This may be difficult or impossible for some or most landowners to determine.

The Connectivity Report determined that pollutants discharged to ephemeral streams and intermittent streams are so likely to reach traditional navigable waters that it is reasonable to include those waters as WOTUS by rule. The Proposed Rule apparently assumes that no pollutants discharged to ephemeral and intermittent streams will reach traditional navigable waters. That assumption appears to be based, not on any scientifically established basis, but rather on wishful thinking only.

There are two significant errors in the Proposed Rule's assumption that discharges to ephemeral or intermittent streams have no impact on traditionally navigable waters. First, traditional navigable waters are entirely derived from a combination of ephemeral stream flow, intermittent stream flow, and incremental, shallow groundwater flow<sup>6</sup>. Without some control over the water quality in those streams that comprise traditional navigable waters, it is impossible that the summation of all those contributions will result in a healthy waterway<sup>7</sup>. The Proposed Rule appears to assume that the flow contribution from ephemeral and intermittent streams have an insignificant impact on WOTUS. That assumption is incorrect and highlights why the Agencies must carefully consider the information contained in the Connectivity Report.

Secondly, the Proposed Rule offers no feasible mechanism to objectively evaluate whether or not discharges to ephemeral and intermittent tributaries that flow to traditionally navigable waters might deliver pollutants to WOTUS. The Proposed Rule appears to assume tributaries will not deliver pollutants to WOTUS. Will it be left up to citizens or the states and tribes to discover when pollutants are reaching WOTUS? Will the public have a way to learn if discharges to ephemeral or intermittent streams is going to take place? Moreover, it is an untenable approach because neither citizens nor the states have the resources to undertake that task.

The Proposed Rule is also confusing with regard to coverage of intermittent streams. The Agencies assert that intermittent streams would be defined as those streams that have continuous flow for "certain times of a typical year". Unfortunately, the Proposed Rule offers no objective basis for determining whether or not an intermittent stream meets that description. There exists no database of flow information that provides an answer to such a question. The Proposed Rule would

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<sup>6</sup> Again, it is worth noting that headwater streams are the cumulative source of approximately 60% of the total mean annual flow to all northeastern streams, according to the Connectivity Report.

<sup>7</sup> Perhaps an analogy would be helpful here. Say you want to build a good, solid brick wall. It is important to exercise quality control over the integrity of the individual bricks used to make the wall. Poor quality bricks will inevitably result in a poor quality wall; ephemeral streams = bricks and traditionally navigable waters = a wall. Crumbling bricks yield crumbling walls and poor water quality in ephemeral streams yields poor water quality in WOTUS.

substitute a confusing, nebulous definition of an intermittent stream for the objective, observable approach defined by the 2015 Rule. **We do not support exclusion of intermittent streams, by any definition, from the Proposed Rule.**

As areas urbanize, the increasing proportion of impervious surfaces results in groundwater starvation. Consequently, streams that had been intermittent or perennial receive diminished groundwater supply resulting in diminished streamflows. Ultimately, urban streams may cross the threshold for coverage under the Proposed Rule's definition of WOTUS. In this way, urban streams progressively would be dropped from Clean Water Act coverage.

The Proposed Rule would also contribute to confusion over coverage of Municipal Separate Storm Sewer System (MS4) discharge permits. Will MS4s be relieved from responsibilities to manage pollutant discharges when the outfalls do not directly meet the definition of WOTUS? What if those discharges would eventually result in discharge of pollutants to streams that meet the new definition of WOTUS?

Here in Alabama, some business interests have vigorously opposed regulation of urban stormwater runoff. These interests sued the regional stormwater management authority in the metropolitan Birmingham area, opposed implementation of improved stormwater management in many ways, and worked to limit the scope and authority of local stormwater management. There is little doubt these interests would actively lobby municipalities to limit their authority to manage discharges to only those streams defined by WOTUS. As noted below, Alabama law requires that state environmental standards (such as MS4 permit requirements) be no more stringent than the Federal requirements. There is little doubt in our minds that water quality coming from our local MS4 systems would degrade WOTUS as a result from adoption of the Proposed Rule.

**Contraction of the WOTUS definition will not yield an economic benefit for the Nation and will result in higher costs for drinking water and water quality restoration.**

Advocates for the Proposed Rule claim that a contraction of the WOTUS definition will result in economic benefits. This is misleading and a stunningly short-sighted perspective. Allowing oil and gas drillers and a limited number of other industries greater latitude to pollute the Nation's waters will harm the health, economic welfare, and enjoyment of the great majority of American citizens. The economic assessment of the Proposed Rule does not evaluate the potential economic impact of increases in flooding, diminished availability and quality of drinking water, and the increased costs associated with increased treatment needed to use water that has been fouled by dischargers to ephemeral and intermittent streams the Proposed Rule would allow. Nor does it place adequate value on the ecosystem services provided by headwaters and wetlands, such as those described by the Connectivity Report. It is impossible to reach a valid cost/benefit assessment when the benefits of healthy headwater streams and wetlands are ignored.

**The Proposed Rule disregards the public comments submitted for the 2015 Clean Water Rule.**

Over a million public comments were submitted for the 2015 Clean Water Rule. About 80% of those comments supported adoption of the 2015 Rule. In rescinding the 2015 Rule, the administration is saying they don't care what those commenters think and they disregard the validity of the scientific and economic impact information those commenters submitted. Discarding those comments

disregards the opinion of people that supported a *more inclusive definition of WOTUS* than is found in the Proposed Rule.

**The Proposed Rule imperils drinking water quality, supply, and cost for Alabamians who rely on having a clean, healthy drinking water, by excluding all ephemeral and potentially some or all intermittent streams that are headwaters of surface drinking water sources, such as the Cahaba River.**

The Cahaba River basin provides the source water for the following public water systems: the Birmingham Water Works Board, which serves approximately 600,000 customers; the Trussville Utilities; the Irondale Water System; the Alabaster Water Board; the Helena Utility Board; and the Pelham Water Works. These public drinking water systems utilize ground and/or surface water sources. It is important to recognize that central Alabama's karst geology results in significant intermingling of surface and groundwater resources. Impacts to one affect the other. For this reason, the Proposed Rule has the potential of negatively impacting both classes of drinking water sources.

The highly probable impacts to jurisdictional waters resulting from deregulation of headwater sources include degraded water quality, reduced water supply (especially during drought), and increased treatment costs to drinking water ratepayers. The Pre-2015 Water Rule had been interpreted to include ephemeral and intermittent streams. The 2015 Rule explicitly includes some ephemeral and all intermittent streams. As the Connectivity Report has made clear, ephemeral and intermittent streams are vital for the protection of WOTUS. Given the inter-connectedness of ground and surface water in the Cahaba watershed, the potential for degrading groundwater sources also exists and is, in our opinion, inevitable.

**The Proposed Rule assumes that groundwater does not influence surface water quality. For the Cahaba (and many other U.S. streams), this is a grave error that will result in significant degradation of the nation's waters.**

As described in the previous section, shallow groundwater and surface waters in the Cahaba River basin (and for many other basins) are intimately connected. The Connectivity Report emphasizes the significant links between surface waters and groundwater for WOTUS generally.

None of the previous water rules have *explicitly* included groundwater in their definition of WOTUS. However, the pre-2015 Water Rule and the 2015 Water Rule acknowledged the significant interconnection of some surface waters to groundwater features or geographical situations through explicit inclusion by rule of some of these features as WOTUS. The Proposed Rule also excludes groundwater, but fails to accommodate our understanding of those surface/groundwater interconnections through explicit inclusion of especially important water features. For example, some isolated wetlands and other features were included as adjacent wetlands under the pre-2015 and 2015 Water Rules but are excluded under the Proposed Rule. We support inclusion of the isolated wetlands and adjacent wetlands that were deemed 'jurisdictional' as was defined under the pre-2015 and 2015 Water Rules.

## **The WOTUS definition should not be limited to only perennially flowing streams.**

The authors of the Proposed Rule invited comment on whether additional intermittent streams should be excluded from the definition of WOTUS. This question is presented with no background information nor any scientific justification for such exclusion. We think excluding intermittent streams from WOTUS is a dangerous concept that has not and cannot be scientifically or economically justified. Elsewhere in these comments, we have underscored our support for including ephemeral and intermittent streams as WOTUS as those were defined by the 2015 Water Rule.

## **Advocates for the Proposed Rule make misleading claims that distort understanding of science, costs, and benefits.**

A number of assertions made by proponents of the Proposed Rule are incorrect. The Agencies have asserted the Proposed Rule 'rebalances the relationship' between the States and the Federal government. A legitimate 'rebalancing' requires that the States have adequate resources, and that States have the legal authority and political will to do more than they presently are. For the State of Alabama, it appears all of those assumptions are incorrect.

The idea that Alabama can take on programs and functions of the Federal agencies or that it may protect a wider range of waterways and wetlands is untrue. Alabama is among the twenty-eight States that requires state environmental standard be no more stringent than the Federal requirements. Our State environmental agency, ADEM, does not have the resources to enforce regulations beyond whatever rule the Agencies adopt. Alabama ranks last in per capita funding of its environmental agency<sup>8</sup>. Our State environmental agency does not have the resources nor the authority to backstop the diminished level of protection suggested by the Proposed Rule.

At the Alabama Department of Environmental Management, our state environmental agency, the Water Program is funded by EPA, fines, permit fees, and by *very limited* state funding. Moreover, the State Legislature recently required the Alabama Department of Environmental Management to return fees collected for the Scrap Tire Disposal and Solid Waste Disposal programs to the Legislature<sup>9</sup>. The idea that the Proposed Rule will encourage 'more flexibility' and help establish a new 'network of coverage' is, from our perspective, rhetorical nonsense. The Proposed Rule would actually leave an enormous gap in the system of protections for our waters.

The hyperbole about the 2015 Rule being a federal 'power grab' was largely based on exaggerated claims about the 2015 Rule regulating 'puddles and ditches' on agricultural land. However, under the Pre-2015 and the 2015 Clean Water Rule, agricultural activities were exempt.

## **The Proposed Rule would encourage *significant* loss of wetlands that now serve vital water supply and flood-prevention functions.**

Alabama has already lost as much as 50 percent of its original wetlands over the past 200 years. Alabama has lost 69 percent of its coastal freshwater marsh and 29 percent of its estuarine marsh in

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<sup>8</sup> [https://www.al.com/news/2017/04/alabama\\_environmental\\_agencys.html](https://www.al.com/news/2017/04/alabama_environmental_agencys.html)

<sup>9</sup> [https://www.al.com/news/2015/09/alabamas\\_environmental\\_managem.html](https://www.al.com/news/2015/09/alabamas_environmental_managem.html)

the interval between 1955 and 1979. If the Proposed Rule is adopted, we stand to lose **an additional** 50 percent of our important wetlands in short order.

In 1996, the US Geological Survey published a summary of wetlands resources status <sup>10</sup>. That report notes that “Some wetlands provide flood control, some provide water for aquifers, others feed streams, some modify climate, others improve water quality, some help maintain the salt balance necessary for estuarine life, and still others control erosion.” <sup>11</sup> These are vital functions that, if lost, will bring more flooding, degraded water quality, and degraded outdoor experiences to Alabamians.

Coastal marshes and inland wetlands are vitally important for Alabama’s seafood industry. The potential economic loss for Alabama is serious.

We appreciate your thoughtful consideration of these comments.

Sincerely,



Beth K. Stewart,  
Executive Director  
Cahaba River Society



Randall C. Haddock, PhD  
Field Director  
Cahaba River Society

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<sup>10</sup> USGS. 1996. Judy Fretwell, John Williams, and Phillip Redman, Compilers. *National Water Summary on Wetland Resources: Water Supply Paper 2425*. Available at <https://pubs.usgs.gov/wsp/2425/report.pdf> .

<sup>11</sup> Ibid., page 3, in the Executive Summary.