Evaluation of State Water Quality Assessments and the National Wild and Scenic Rivers System

A Technical Paper of the Interagency Wild and Scenic Rivers Coordinating Council

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Preface

This report was written by Kathryn Willi (Conservation Legacy) and Jennifer Back (NPS). As a product of the Interagency Wild and Scenic River Coordinating Council (IWSRCC), this technical paper received extensive peer review to ensure that its information was accurate and credible. Multiple rounds of review were provided by many individuals with expertise in wild and scenic rivers and/or the Clean Water Act, including members of the IWSRCC, regional wild and scenic river managers from various federal river administering agencies, and employees of the Environmental Protection Agency. Although water quality is not a requirement for designation, it is a fundamental value of wild and scenic rivers. This report provides preliminary information necessary to aid future collaborative efforts to protect and enhance the water quality of wild and scenic rivers.

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INTRODUCTION

Clean water is a fundamental part of healthy rivers. It provides services to communities in the form of recreation, drinking water, habitat for fish and other wildlife, and the underlying pleasures of pristine beauty. The Wild and Scenic Rivers Act (WSR Act)[1] establishes water quality as one of the three "river values"[2] of a Wild and Scenic River (WSR) that river managing agencies must protect and enhance:

Section 1(b): *The Congress declares that the established national policy of dam and other construction at appropriate sections of the rivers of the United States needs to be complemented by a policy that would preserve other selected rivers or sections thereof in their free-flowing condition to protect the water quality of such rivers and to fulfill other vital national conservation purposes.*

Section 10(a): *Each component of the national wild and scenic rivers system shall be administered in such manner as to protect and enhance the values which caused it to be included in said system…*

However, WSRs are not insulated from the external stressors outside their river boundaries. Despite great advancements in water quality control and these rivers' placement into the National WSR System, they are still susceptible to impairment. Because water quality is one of the three river values of the WSR Act that must be protected and enhanced, it is important to understand the water quality condition within WSRs, identify key stressors to water quality, and develop innovative approaches to address water quality issues.

Although water quality protection is a fundamental river value of the WSR Act, there has been no comprehensive effort to assess the state of water quality within the National WSR System. The purpose of this report is to address this issue by evaluating the status of water quality of designated WSRs using state water quality reports prepared under the guidance of the Clean Water Act.[3]

The year 2018 marks the 50th anniversary of the WSR Act and provides an ideal time to evaluate the program's successes and weaknesses as they relate to water quality. This comprehensive assessment of all WSRs provides information on the status of water quality for each WSR, common water quality stressors faced by WSRs, and future opportunities for the protection and restoration of some of the nation's most special rivers.

[1] 16 U.S. Code 1271-1278, Public Law No. 90-542, as amended. Citations to the WSR Act in this paper are to the sections in the public law, rather than to the sections in the U.S. Code.
[2] The values for which rivers are designated are referred to collectively in this paper as "river values." See Sections 1 and 10(a) of the WSR Act.
[3] 33 U.S. Code 1251-1376.

Water Quality and the Wild and Scenic Rivers Act

WSRs are federally protected free-flowing rivers that exhibit outstanding recreational, natural, cultural, or other similar values. The WSR Act was created by Congress in 1968 to protect these special characteristics for current and future generations to enjoy, while also acknowledging the potential for appropriate development. The federal responsibility for managing the National WSR System is shared by the U.S. Forest Service (USFS), Bureau of Land Management (BLM), U.S. Fish and Wildlife Service (USFWS), and the National Park Service (NPS). This shared responsibility has led to a national system of protected rivers that provides a unique example of interagency collaboration.[4] Currently, there are 209 WSRs,[5] some of which are managed by more than one agency or primarily administered by states and tribes. Others are managed in partnership with state and local governments or a special management council.

WSRs are designated by Congress, or in some instances, the Secretary of Interior, after sufficient evidence of that river's importance and applicability for inclusion is identified. While water quality is a fundamental value of WSRs and has implications for classification, the 1982 Interagency Guidelines[6] state that a river does not need to possess high water quality to be included in the National WSR System. However, once a river is designated, water quality becomes one of the three central river values under the WSR Act that managing agencies must work to protect and enhance. The three river values of a WSR under the WSR Act are: (1) the river's free-flowing condition, (2) the outstandingly remarkable values that make the river nationally or regionally significant, and (3) the river's water quality. The direction to protect and enhance the characteristics that led to the designation of a WSR has been interpreted as a "non-degradation and enhancement policy for all designated river areas" under the 1982 Interagency Guidelines. As part of this protection, the WSR Act prohibits federally licensed hydropower projects including dams, reservoirs, and powerhouses as well as other federally assisted projects that would damage the river's free-flowing condition, outstandingly remarkable values, or water quality.[7]

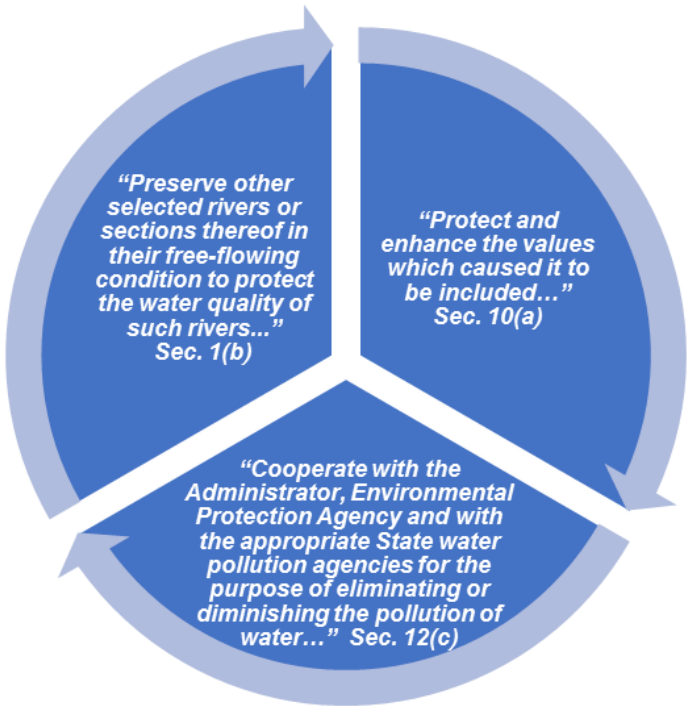
In addition to the primary requirements of protecting and enhancing the water quality of every WSR, many WSR outstandingly remarkable values have strong ties to water quality. In some instances, water quality is identified as an outstandingly remarkable value. To protect and enhance outstandingly remarkable values that rely upon clean water such as fish, recreation, or wildlife, managing agencies, within their authority, must maintain the water quality needed to support them. Moreover, a river's free-flowing condition and its water quality are inextricably linked in the WSR Act, as the WSR Act clearly states that a primary purpose is to "preserve other

[4] Haubert, J. 1998. An introduction to wild and scenic rivers. Technical Report of the Interagency Wild and Scenic Rivers Coordinating Council. National Park Service, Washington, D.C.
[5] East Rosebud Creek in Montana was designated as a Wild and Scenic River in August 2018, after our assessment was conducted. Consequently, East Rosebud Creek is not included in this report's findings and statistics on wild and scenic river water quality.
[6] 47 F.R. 39454.
[7] Section 7 of the WSR Act.

selected rivers or sections thereof in their free-flowing condition to protect the water quality of such rivers…"[8]

At the time of the passage of the WSR Act in 1968, Section 12(c) delegated the authority for protecting water quality to state water pollution control agencies. With the creation of the Environmental Protection Agency (EPA) and the Clean Water Act in the early 1970s, Section 12(c) was subsequently amended to direct WSR managing agencies to cooperate with the EPA and related state agencies to identify and address water quality issues.[9] This section of the WSR Act established the overall framework for managing agencies to work in a collaborative role with water quality control agencies to achieve water quality objectives.

Figure 1: WSR management responsibilities related to water quality, as stated in the WSR Act.



The Clean Water Act establishes a process for states to use to develop information on the quality of the nation's waters. Each state must develop a program to monitor the quality of its surface and groundwaters and prepare a report describing the status of its water quality. The EPA compiles the data from the state reports, and transmits a summary of the data to Congress along with an analysis of the status of water quality nationwide. This process described under Section 305(b) of the Clean Water Act is the principal means by which the EPA, Congress, and the public evaluate whether United States waters meet water quality standards.[10] To address the specified goals of the WSR Act that relate to water quality, information from these state water quality assessment reports was used to evaluate the status of water quality for each WSR and

[8] Section 1(b) of the WSR Act.
[9] Section 12(c) of the WSR Act.
[10] 33 U.S. Code 1315.

inform this technical paper. The following section provides information on state water quality standards and reporting methods as required under the Clean Water Act.

Water Quality Standards and the Clean Water Act

The WSR Act requires managing agencies to protect and enhance water quality, but the authority for regulating water quality rests with the states under the Clean Water Act (CWA). The CWA Section 101 objective, "…to restore and maintain the chemical, physical, and biological integrity of the Nation's waters," is often expressed as a goal of making all waters "fishable/swimmable." To achieve this goal, states must adopt and implement EPA-approved water quality standards for waters within their jurisdiction.[11] There are three elements of water quality standards: (1) designated uses for all waterbodies, (2) numerical and/or narrative water quality criteria for those uses, and (3) antidegradation policies to prevent waters from deteriorating below their current condition.

Designated Uses

Designated uses (DUs) of a waterbody are defined by each state and vary in specificity and scope. Examples of DUs include recreation, drinking water supply, propagation of fish and wildlife, and agriculture. Many waterbodies have more than one DU. DUs determine the water quality criteria that must be met within a waterbody; for example, an industrial DU could have less stringent water quality criteria than a DU of primary contact recreation. The water quality criteria can be either numerical or narrative descriptions of the physical, chemical, and biological characteristics that should be assessed and monitored to support the DU.[12] It is possible for one waterbody with a lower measured level of a given pollutant to fail in meeting its water quality criteria, while a neighboring waterbody with a higher measured level of the same pollutant is considered to have good water quality.

Antidegradation

The EPA's antidegradation requirements are implemented in combination with DUs and water quality criteria. States must protect and prevent waters from degradation below their current conditions based on a tiered classification system. Tier 1 waters receive the most basic level of protection that includes only the maintenance of water quality to support "existing uses" for all waters. The water quality of Tier 2 waters exceeds the basic goals necessary to make them "fishable/swimmable." Therefore, they must be managed to maintain their current, higher level of water quality. Degradation is only allowed if it cannot be avoided, and only after public review has occurred. Tier 3 waters, or Outstanding National Resource Waters, are considered the highest quality waters of the United States and are afforded the highest level of protection. Their existing higher quality must be managed so that it is maintained and protected. No degradation of water quality is allowed except where degradation is short-term and temporary. Lastly, some

[11] 40 C.F.R. 131.

[12] United States Environmental Protection Agency (EPA). 2012a. Water Quality Standards Handbook. Chapter 2: designation of uses. Available at: https://www.epa.gov/sites/production/files/2014-10/documents/handbook-chapter2.pdf (accessed 23 January 2018).

states have developed Tier 2½ designations that secure more protection than Tier 2, but without the strict provisions against lowering of water quality found in Tier 3 protection.[13]

State Integrated Water Quality Reports

There are two sections of the CWA that relate to state water quality reporting requirements. Section 305(b) of the CWA directs states to identify whether or not assessed waters are meeting their use-specific water quality criteria every two years. Section 303(d) requires states to identify impaired waters, the causes of their impairment, and details on the actions being taken to restore them. With few exceptions, states are typically directed to address an impairment by administering an EPA-approved Total Maximum Daily Load (TMDL) that calculates the reduction in pollutant necessary to achieve water quality standards. Together, Sections 305(b) and 303(d) make up what the EPA refers to as an Integrated Report. States are not required to integrate their 305(b) and 303(d) reports, but most have adopted the practice or are moving in that direction.

The EPA defers to states on how their waters are ultimately monitored and evaluated. However, the EPA must still approve these state-adopted methodologies. Many state water quality monitoring programs use a combination of targeted and probabilistic approaches that are often implemented by basin on a rotational basis. It is not uncommon for multiple years to pass before resampling occurs within a waterbody assessment unit.

Although states develop their own monitoring protocols, the EPA has established a numerical system to assist states in identifying the condition of their waterbodies in a nationally consistent manner. [14] The numerical system includes different categories of water quality status based on the DUs of a waterbody. Category 1 indicates a waterbody where all DUs have been assessed and they are all fully supported. Category 2 indicates that DUs that were assessed are fully supported (i.e., some, but not all, DUs have been assessed). Category 3 is used for waters where there is insufficient information to determine if any DU is being met. Category 4 waters are impaired or threatened, but a TMDL is not necessary or applicable: 4a indicates a TMDL has already been completed; 4b indicates that the impairment is being addressed by another pollution control requirement that will achieve water quality standards in a reasonable amount of time (e.g., updated best management practices at a discharging point source); and 4c represents impairments that are not caused by a pollutant (e.g., harmful alterations to flow). Category 5 waters are waters listed under Section 303(d) of the CWA that are impaired or threatened by a pollutant, and a TMDL study and determination is needed. Lastly, 5-alternative is a category that was recently created for waters listed under Section 303(d) of the CWA; they are impaired or threatened by a

[13] United States Environmental Protection Agency (EPA). 2012b. Water Quality Standards Handbook. Chapter 4: Antidegradation. Available at: https://www.epa.gov/sites/production/files/2014-10/documents/handbook-chapter4.pdf (accessed 23 January 2018).

[14] United States Environmental Protection Agency (EPA). 2015. Memorandum: Information Concerning 2016 Clean Water Act Sections 303(d), 305(b), and 314 Integrated Reporting and Listing Decisions.

pollutant, but an official alternative restoration plan is being pursued and TMDL development is not prioritized.[15]

Based on the EPA's Assessment and TMDL Tracking and Implementation System (ATTAINS), the EPA considers waters in Categories 1-2 to have good water quality and waters in Categories 4-5 to be impaired.[16] For clarity, this report will additionally define Category 3 waters as waters with unknown water quality.

Table 1: EPA's suggested integrative reporting categories and their associated water quality status.

EPA Category	Narrative Description	Qualitative Status
1	All DUs met	Good
2	All assessed DUs met	Good
3	Cannot determine if any DUs met	Unknown
4	Impaired/Threatened DU – TMDL not needed	Impaired
4a	Impaired/Threatened DU – TMDL completed	Impaired
4b	Impaired/Threatened DU – Adequate non-TMDL control measure	Impaired
4c	Impaired/Threatened DU – Non-pollutant causes	Impaired
5	Impaired/Threatened DU – TMDL needed, "303(d) listed"	Impaired
5-alternative	Impaired/Threatened DU – TMDL alternative, "303(d) listed"	Impaired

Unassessed Waters

This assessment also identified WSR segments that were not explicitly acknowledged in their associated state's water quality report as unassessed. Most states do not have the resources to physically assess all waters within their jurisdiction and therefore not all waterbodies are identified in state 305(b) reports. To diminish these data gaps, some states, such as Wyoming[17] and Florida,[18] have developed statistical tools that provide broad estimates of water quality at a regional or other comparable scale. These statistical estimates provide a general picture of statewide water quality status, but they do not provide the resolution that is necessary to evaluate the status of specific waterbody units. Consequently, these broad statistics were not used in our evaluation of WSR water quality.

[15] Because Category 5-alternative is novel, not all states have adopted its use in their Integrated Reports. There are no WSRs with Category 5-alternative impairments.

[16] United States Environmental Protection Agency (EPA). 2017. Assessment and TMDL Tracking and Implementation System website (ATTAINS). Available at: https://www.epa.gov/waterdata/assessment-and-total-maximum-daily-load-tracking-and-implementation-system-attains (accessed 23 January 2018).

[17] Wyoming Department of Environmental Quality. 2016. Wyoming's 2014 integrated 305(b) and 303(d) report. Wyoming Department of Environmental Quality, Cheyenne, Wyoming.

[18] Florida Department of Environmental Protection. 2016. Final integrated water quality assessment of Florida: 2016 sections 303(d), 305(b), and 314 report and listing update. Florida Department of Environmental Protection, Tallahassee, Florida.

USING STATE WATER QUALITY ASSESSMENTS

Methodology

To determine the water quality status of all designated WSRs and the geospatial extent of those assessments, we relied primarily upon the most current (as of January 2018), publicly available state 305(b), 303(d), and Integrated Reports.[19] State assessment geodatabases/shapefiles were also used if they were available, along with EPA's ATTAINS system when state reports did not provide spatial information about the extent of a waterbody unit. We then derived WSR water quality statistics by using the National Wild and Scenic River Segments feature layer in ArcMap™ and manually adding the water quality information of interest to each WSR segment. If a state-defined waterbody assessment unit did not align with a WSR segment, ArcMap™'s "Split" tool was used to delineate the water quality information accurately within the WSR feature layer.

Water quality information that was gathered per waterbody assessment unit included: the year of the reporting cycle, the assigned DUs, the EPA reporting category, the impaired DUs, the cause(s) of impairment,[20] the probable source(s) of impairment (when provided in the state report), and the associated antidegradation designation. Prior to processing the hydrography of each WSR, the data frame within ArcMap™ was projected to each river segment's appropriate North American Datum 1983 Universal Transverse Mercator zone. The lengths of the WSR segments were then calculated using the "Calculate Geometry" tool. This technique to compute river mileages was based on the methods used by NPS's Hydrographic and Impairment Statistics online database.[21]

Caveats to Assessment Methods

A water quality assessment based on multiple data sources and methods has limitations. States track and delineate water quality in different ways, which makes it challenging to compare water quality assessments between WSRs. There is great variability in the water quality criteria used to determine whether a waterbody is impaired from state to state, or even within the same state, due to the diversity of DUs and their associated parameters.

Not only do states utilize different parameters to assess their water quality, they also define assessment units differently. Depending on the state's methodologies, waterbody assessment units may be a portion of a reach, an entire river, or sometimes an entire sub-basin. Sometimes, state reports do not provide any description of geospatial extents. Furthermore, states interpret

[19] Some of the more recent reports were draft documents and not yet EPA-approved.
[20] Causes of impairment are state-defined, and vary from state to state. Consequently, the EPA developed 34 general 'parent impairment' categories that aggregate the hundreds of state-specific impairment causes. For example, a waterbody identified by its state as having an impairment caused by *Escherichia coli* would fall under the more general category 'pathogens.' For this assessment, both the state-defined causes of impairment and their associated general classifications were identified.
[21] National Park Service (NPS). 2017. Hydrographic & Impairment Statistics (Methods) website. Available at: https://nature.nps.gov/water/HIS/methods.cfm (accessed 23 January 2018).

the EPA's numerical reporting categories in unique ways. Some may impart the numerical values upon individual parameters within a DU, an entire DU, or the entire assessment unit. Some states have tailored the numerical criteria to such an extent that it is a different reporting scheme altogether. Since this project required that all assessments be accounted for in a consistent manner, assumptions and judgment calls were often necessary.

Antidegradation status is also challenging to differentiate due to differences in state reporting narrative techniques. In particular, it was difficult to determine whether a river was designated as either a Tier 2 ½ or Tier 3 waterbody. For a consistent approach in identifying Tier 3 waters, only rivers explicitly identified as either Outstanding National Resource Waters or Tier 3 waters were considered to have Tier 3 protection for the purposes of this technical paper.

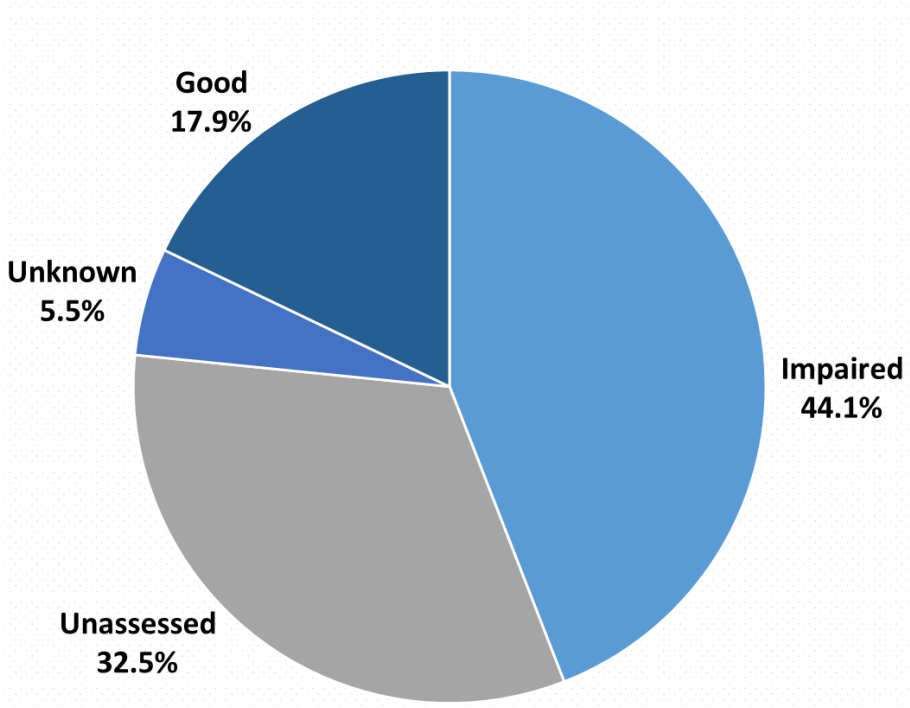
Total mileages of WSRs used in this report are not identical to the mileages derived from legislative language that are referenced by the IWSRCC on rivers.gov (12,753.5 miles).[22] Differences in mileages are due to varied techniques used to calculate the lengths of river segments, changes in channel morphology, and more advanced mapping capabilities. In this report, the use of ArcMap™ may introduce a certain degree of error since the "Calculate Geometry" tool generates planimetric measurements that are independent of topography.

[22] East Rosebud Creek in Montana was designated as a Wild and Scenic River in August 2018, after our assessment was conducted. Consequently, East Rosebud Creek is not included in this report's findings and statistics on wild and scenic river water quality.

FINDINGS

This IWSRCC report presents the results of an assessment of water quality of WSRs using state water quality reports. Based on the most current and publicly available state water quality reports and assessments (as of January 2018), 123 of the 208 WSRs have river reaches that are impaired, constituting 5,781 of the 13,107 total WSR miles (44.1%).[23] Additional analysis of WSR impairments shows that 90 WSRs have impairments that are listed as Category 5, meaning that no EPA-approved strategy to improve the water quality problem currently exists. Of the remaining WSR miles, 2,347 miles are considered to have good water quality (17.9%), while 723 WSR miles have unknown water quality (5.5%). Furthermore, a total of 4,256 miles, or 32.5%, were unaccounted for in their associated state reports (i.e., these river miles are unassessed in their respective state's most recent water quality report).

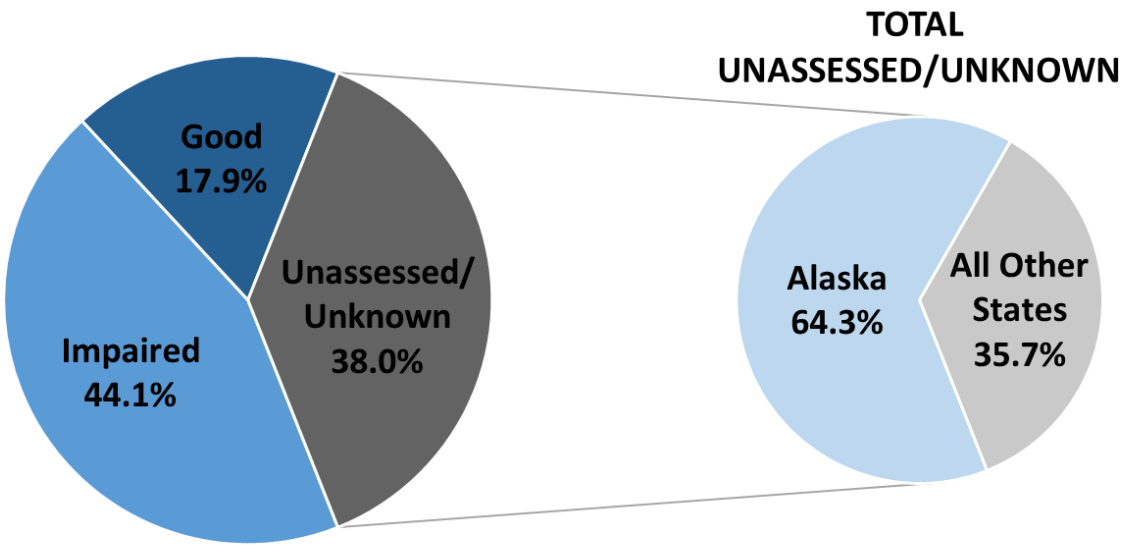
Figure 2: Percentage of WSR miles based on state water quality status.



Additional analysis concludes that 3,201 of the 4,979 total unassessed and unknown WSR miles are within the state of Alaska (64.3%). Birch Creek was the only WSR in Alaska that did not have unknown or unassessed water quality.

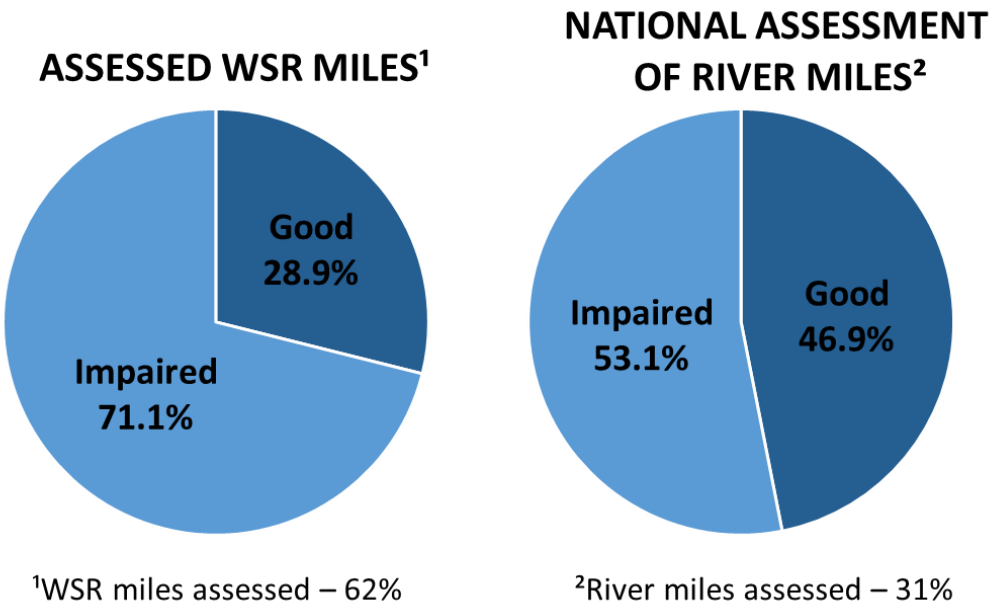
[23] Total mileages of WSRs used in this report are approximate, rounded to the nearest whole number, and are not identical to the mileages derived from legislative language that are referenced by the IWSRCC on rivers.gov (12,753.5 miles). Both physical changes in channel morphology and the techniques involved in developing the official mileages result in different lengths when compared to the geospatially-derived mileages within this report.

Figure 3: Percentage of WSR miles based on state water quality status, with unassessed and unknown miles further broken down by state. 64.3% of all unassessed and unknown WSR miles are within Alaska.



If we consider only WSR miles that were completely assessed (i.e., good or impaired/threatened), the percentage of WSR miles that are impaired increases from 44.1% to 71.1%, and the percentage of good miles increases from 17.9% to 28.9%. Based on the EPA's national data on water quality, 53.1% of all assessed river miles in the United States are impaired while 46.9% are good (EPA 2017). This indicates that WSRs have a higher proportion of impairment than that of all assessed rivers in the United States.

Figure 4: Percentage of fully assessed WSR miles based on state water quality status compared to the EPA's national statistics on fully assessed river miles.



Of the total WSR miles impaired, the most common causes of impairment, in decreasing order, are:

1) Temperature: High water temperatures can harm or kill aquatic life by increasing the toxicity of other pollutants, decreasing the oxygen content in water, or raising temperatures beyond an organism's survival limits. Temperature impairments can be caused by stormwater runoff, industrial/agricultural discharges, major water withdrawals, or the removal of riparian vegetation.[24]

2) Mercury: Mercury exposure at higher doses is harmful to both aquatic life and people. Much of the mercury found in the United States originates from global sources, but anthropogenic sources of mercury within the United States are primarily from industries like coal-burning power plants. Once in the water, mercury builds up in fish tissue, dissolves into the water, or settles to the bottom sediments. High levels of mercury in fish can make them unsafe for human consumption, and is frequently the cause of fish advisories.[25]

[24] United States Environmental Protection Agency (EPA). 2016. Summaries of EPA water pollution categories used in the ATTAINS data system. Available at: https://www.epa.gov/sites/production/files/2016-02/documents/160112parent_plain_english_descriptions_finalattainsnames.pdf (accessed 23 January 2018).
[25] United States Environmental Protection Agency (EPA). 2013. National Listing of Fish Advisories Technical Factsheet. Available at: https://www.epa.gov/sites/production/files/2015-06/documents/technical-factsheet-2011.pdf (accessed 23 January 2018).

3) Metals: Excess levels of arsenic, lead, selenium, and other metals in water can be toxic to animals and humans. High concentrations of metals are typically caused by human activities such as mining and industrial processes or by natural processes like erosion.

4) Sediment: Sediment is a natural property of riverine systems, but too much sediment can be harmful to fish and other aquatic organisms by decreasing water clarity, damaging habitat, and allowing more surfaces to which pollutants can attach. Sediment pollution occurs after erosion from natural or human activities.

5) Polychlorinated biphenyls (PCBs): Although banned in the 1970s, PCBs are toxic chlorine-containing industrial chemicals that do not readily break down once in the environment and are still prevalent today. PCBs are found in water due to the improper disposal of PCB-containing materials. Once in the water, they can build up in animal tissue or settle to the bottom sediments. High levels of PCBs in fish can make them unsafe for human consumption, and are frequently the cause of fish advisories.[26]

6) Pathogens: Bacteria, viruses, and other microbial organisms can lead to disease in animals, making pathogen-contaminated water unsafe to drink or swim in. Abnormally high concentrations of pathogens are caused by the presence of feces in water, typically related to stormwater runoff and agriculture.[27]

Table 2: WSR top impairments by total miles.

Impairment	Total Miles
Temperature	2,554
Mercury	1,320
Metals	1,136
Sediment	1,041
PCBs	905
Pathogens	840
Impaired Biota	679
Organic Enrichment/Oxygen Depletion	586
pH	576
Nutrients	419

Based on the total number of WSRs impaired, the most common causes of impairment include temperature, mercury, pathogens, metals, PCBs, and impaired biota. For detailed information regarding specific WSRs and their water quality status, see the appendix.

[26] United States Environmental Protection Agency (EPA). 2013. National Listing of Fish Advisories Technical Factsheet. Available at: https://www.epa.gov/sites/production/files/2015-06/documents/technical-factsheet-2011.pdf (accessed 23 January 2018).

[27] United States Environmental Protection Agency (EPA). 2016. Summaries of EPA water pollution categories used in the ATTAINS data system. Available at: https://www.epa.gov/sites/production/files/2016-02/documents/160112parent_plain_english_descriptions_finalattainsnames.pdf (accessed 23 January 2018).

Table 3: WSR top impairments by total rivers.

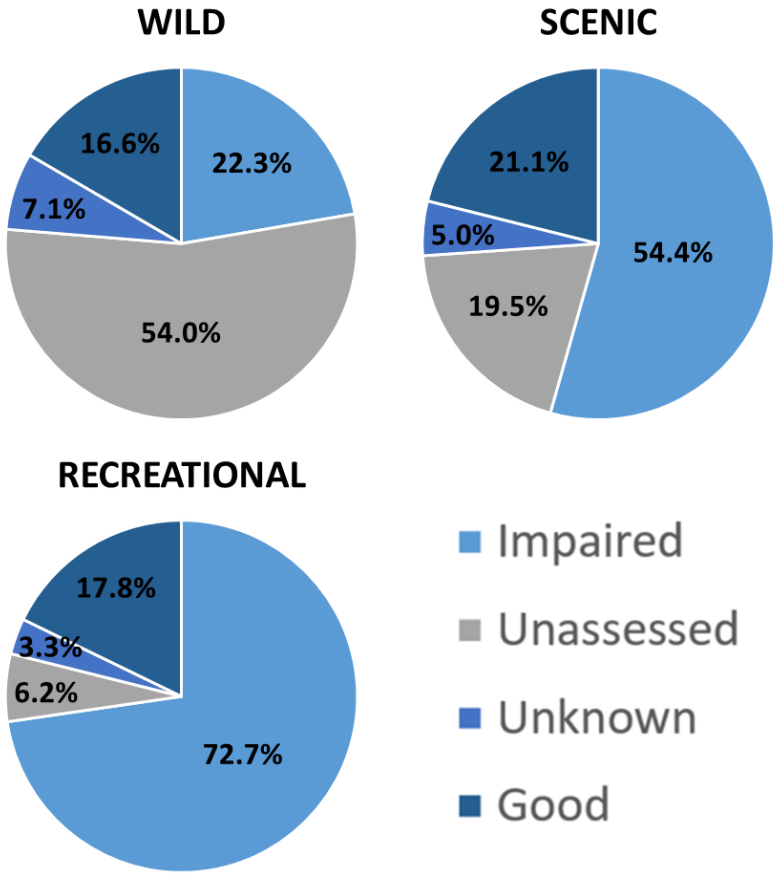
Impairment	Total Rivers
Temperature	62
Mercury	34
Pathogens	32
Metals	21
PCBs	21
Impaired Biota	21
Organic Enrichment/Oxygen Depletion	19
pH	17
Flow Alterations	16
Sediment	15

Wild and Scenic River Assessments by River Classification

WSR water quality statistics were also assessed by river classification (i.e., wild, scenic, and recreational). Of the 6,430 WSR miles classified as wild, 1,435 miles are impaired (22.3%), 1,065 miles have good water quality (16.6%), 455 miles are unknown (7.1%), and 3,475 miles were unassessed (54.0%). Of the 2,777 WSR miles classified as scenic, 1,510 miles are impaired (54.4%), 586 miles have good water quality (21.1%), 140 miles are unknown (5.0%), and 541 miles were unassessed (19.5%). Of the 3,900 WSR miles classified as recreational, 2,836 miles are impaired (72.7%), 695 miles have good water quality (17.8%), 129 miles are unknown (3.3%), and 240 miles were unassessed (6.2%).

Not surprisingly, wild rivers have the largest percentage of unassessed/unknown miles and the lowest percentage of miles that have been identified as impaired. Conversely, recreational rivers have the largest percentage of impaired miles and the lowest percentage of unassessed/unknown miles. When evaluated by river classification, scenic rivers have the largest percentage of miles that are considered good. This may be due in part to the large number of unassessed/unknown wild WSR miles that would be expected to have good water quality.

Figure 5: Percentage of WSR miles by river classification, based on state water quality status.



Wild and Scenic River Assessments by Agency

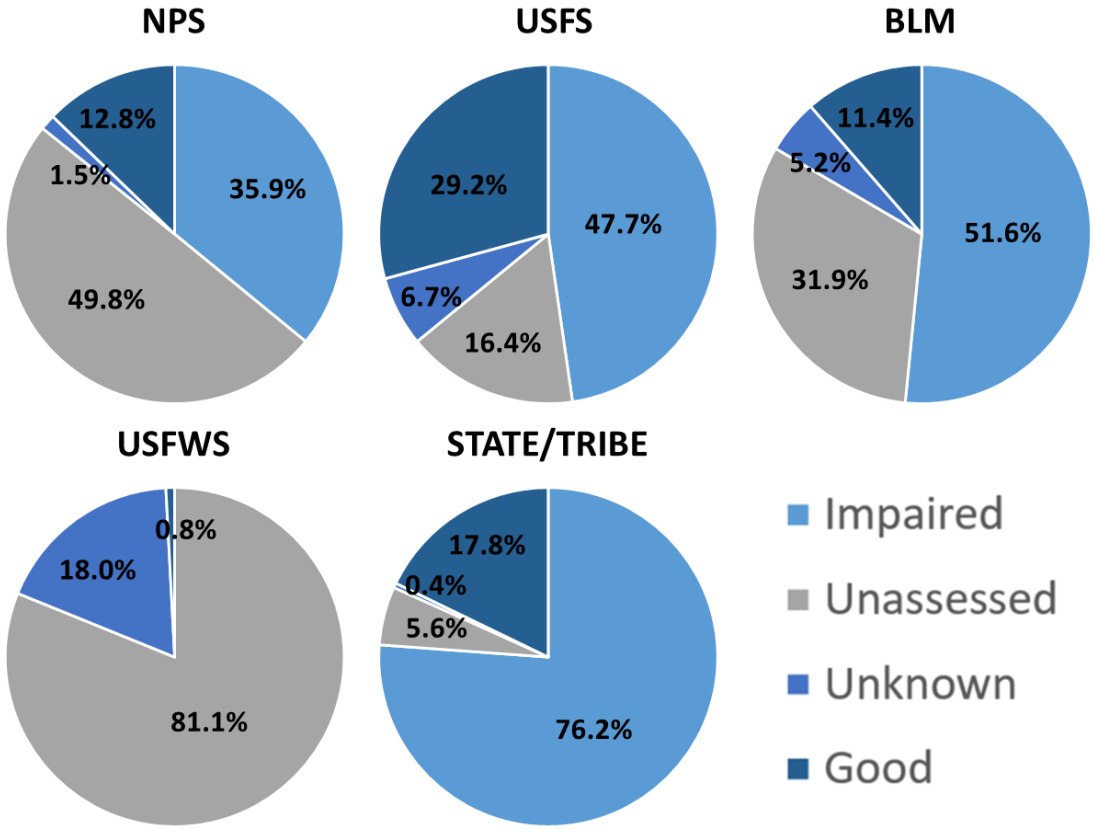
Subsequently, we assessed water quality status by managing agency.[28] Of the 3,416 WSR miles managed by NPS, 1,227 miles are impaired (35.9%), 437 miles have good water quality (12.8%), 50 miles are unknown (1.5%), and 1,702 miles were unassessed (49.8%). Of the USFS's 5,240 total WSR miles, 2,500 miles are impaired (47.7%), 1,532 miles have good water quality (29.2%), 350 miles are unknown (6.7%), and 858 miles were unassessed (16.4%). Of the 2,360 WSR miles managed by BLM, 1,217 miles are impaired (51.6%), 269 miles have good water quality (11.4%), 122 miles are unknown (5.2%), and 752 miles were unassessed (31.9%). Of USFWS's 1,087 total WSR miles, 882 miles were unassessed (81.1%). Of the remaining USFWS miles, 196 have unknown water quality (18.0%) while 9 miles have good water quality (0.8%).

[28] These management-based mileages are estimated. WSR segments are classified as NPS, USFS, BLM, USFWS, or state/tribe. In this report, partnership rivers, or WSRs that are managed by NPS in cooperation with local governments or organizations, are classified as NPS. WSR segments that are state/tribe managed but flow through federal lands, such as segments of the Trinity River and the Klamath River in California, are classified with the associated federal land managing agency. It should also be noted that some WSR segments are managed by multiple agencies, and are included in more than one agency bracket. Examples of WSR segments managed by more than one agency include segments of the Flathead WSR, where the WSR creates the boundary between Glacier National Park and Flathead National Forest.

Of the 1,128 miles managed by a state or a tribe, 859 miles are impaired (76.2%), 201 miles have good water quality (17.8%), 5 miles have unknown water quality (0.4%), and 63 miles were unassessed (5.6%).

The USFS has the largest percentage of river miles with good water quality, while the USFWS has the lowest percentage of river miles with good water quality. This may be due in part to the large number of wild USFWS WSR miles in Alaska that are unknown/unassessed. States and tribes had the lowest percentage of unassessed/unknown miles, but the largest percentage of impaired miles.

Figure 6: Percentage of WSR miles by agency, based on state water quality status.

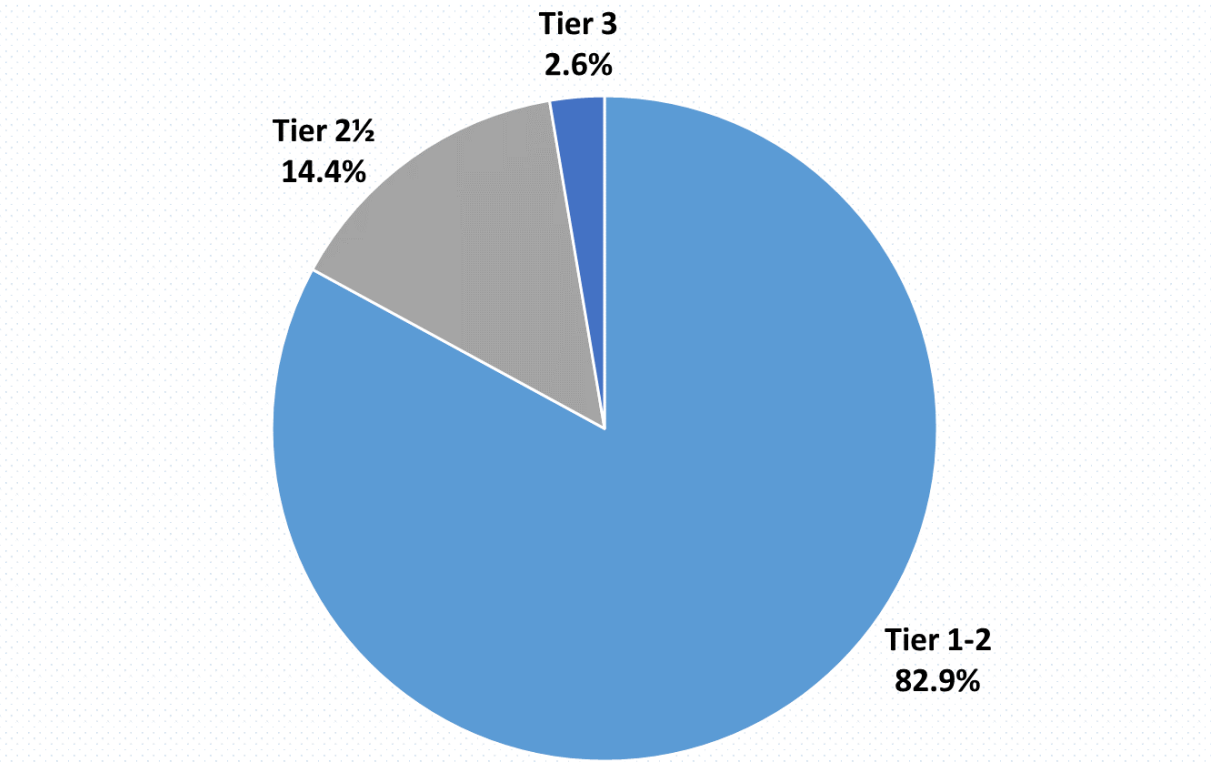


Wild and Scenic Rivers with Antidegradation Protection

Antidegradation policies for WSRs were also explored in this evaluation of water quality. We identified 38 rivers classified with Tier 2½ antidegradation status, or a total of 1,889 WSR miles (14.4%). Eleven WSRs have Tier 3 antidegradation status (also known as Outstanding National Resource Waters), or a total of 347 WSR miles (2.6%). Not every WSR that has protective antidegradation status is fully covered; that is, some WSRs only have some reaches with

antidegradation protection.[29] For detailed information regarding specific WSRs and their antidegradation status, see the appendix.

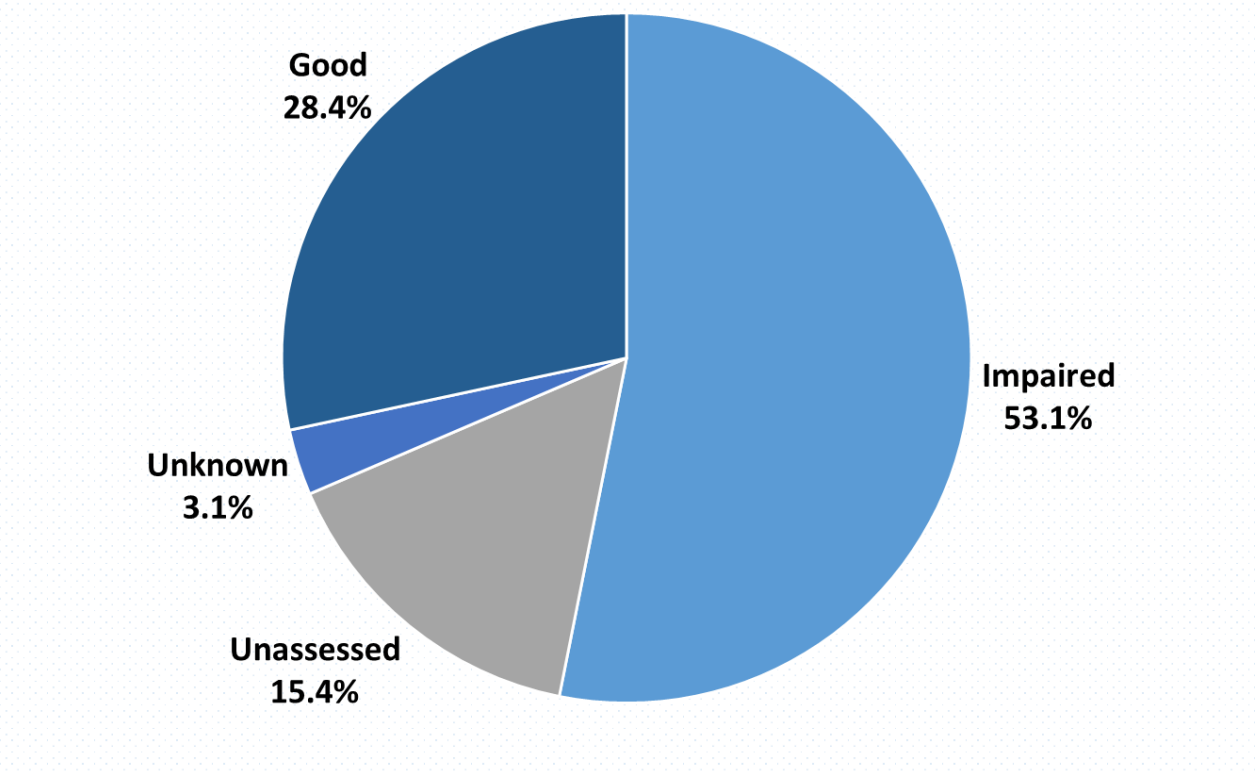
Figure 7. Percentage of WSR miles based on antidegradation status.



Further analysis of WSR miles with Tier 2½ or Tier 3 antidegradation status indicates that 30 of those 48 WSRs are impaired (62.5%), or a total of 1,188 miles (53.1%). Of the remaining miles with Tier 2 ½ or Tier 3 antidegradation status, 634 miles have good water quality (28.4%), 69 miles have unknown water quality (3.1%), and 345 miles were unassessed (15.4%).

[29] It should also be noted that the Obed WSR in Tennessee has both Tier 2 ½ and Tier 3 antidegradation protection on separate reaches.

Figure 8. Percentage of WSR miles with Tier 2½ or Tier 3 antidegradation protection, based on state water quality status.



INTERPRETATION OF FINDINGS

There are a number of key points to consider when interpreting the results of this study:

1) This study represents a reconnaissance level assessment of the water quality condition of WSRs conducted in early 2018. This report does not evaluate changes in water quality of WSRs over time, including those instances where water quality may have improved.

2) The information used in this report is based on publically available information compiled by states and provided to the EPA. Reporting requirements under the CWA, water quality standards and methods, and state agency compliance and enforcement procedures have all changed over time. Therefore, the type of information used in this study reflects conditions and reporting requirements that existed in early 2018.

3) Assessing water quality through the lens of the CWA is an essential component to evaluating the water quality status of the National WSR System, but there are other important aspects of WSR water quality that are not analyzed or addressed in this report. The water quality condition of an individual WSR depends on site-specific characteristics that are beyond the scope of this national assessment.

4) Although water quality is a fundamental value that a river managing agency is responsible for protecting, good water quality is not required for a river to be included in the National WSR System. In fact, a number of rivers had water quality issues or were considered impaired at the time of their designation.[30]

Despite these key points, the results of this study still suggest that water quality remains an issue for a large portion of WSRs. The following sections highlight the key findings of this national water quality assessment of WSRs.

Water Quality and Outstandingly Remarkable Values

Not only do water quality impairments impede the goals of enhancing water quality under the WSR Act, many water quality impairments can also directly degrade a WSR's specifically identified outstandingly remarkable values (ORVs) that must be protected and enhanced. One such example is pathogens. Of the 32 rivers with pathogen impairment, approximately 26, or 81.3%, have a recreational ORV.[31] High levels of pathogens can directly threaten recreational ORVs since pathogens pose a serious risk to people recreating in water. Beyond its implications related to ORVs, pathogens hinder a waterbody from meeting its basic "fishable/swimmable" requirements under the CWA. Those water quality impairments that directly degrade both water quality and a WSR's ORVs, such as the pathogen example above, or temperature impairments to fish-related ORVs, are especially important to recognize and work towards improving.

[30] For example, the Sudbury, Assabet, and Concord Wild and Scenic River in Massachusetts had water quality issues at the time of designation.

[31] WSR ORVs were determined using the National Wild and Scenic River Segments feature layer.

Hydrologic Alteration and Wild and Scenic Rivers

Hydrologic alteration is an important aspect of water quality because major changes in streamflow can harm aquatic communities as well as degrade other water quality parameters like temperature and sediment. In 2015, the EPA clarified its CWA guidelines to explicitly identify hydrologic alteration as an impairment that should fall under Category 4c, or impairments caused by non-pollutants that still require remediation.[32] Hydrologic alteration is defined as detrimental changes in the magnitude, duration, or timing of stream flows that are required for meeting that waterbody's water quality standards.[33] Like other standards, states that acknowledge hydrologic impairments interpret and identify hydrologic impairments differently. For example, the state of Pennsylvania labels such impairments as "Water/Flow Variability,"[34] while the state of Oregon labels hydrologic alteration as "Flow Modification."[35] Currently, 16 rivers, or 259 WSR miles, have hydrologic impairments based on their associated state's water quality reports. The use of Category 4c recognizes the intimate connection between water quality and flow as expressed in the WSR Act. It also provides a unique opportunity to preserve a WSR's free-flowing condition as it relates to the DUs that the state has defined for it.

303(d)-listed Wild and Scenic Rivers

When a waterbody is identified as a Category 5 water in state water quality reports (also known as the 303(d) list), it is considered impaired. Once a waterbody has been added to the 303(d) list, it stays there until further investigation of the waterbody identifies the sources of the pollutant and the state is able to develop an official strategy to restore it.[36] Ninety WSRs, or 43.3% of all WSRs, have impairments that are on the 303(d) list, indicating that these WSRs do not yet have an EPA-approved strategy to improve or address their water quality. Increasing the understanding of why these WSRs are on the 303(d) list, and identifying steps that must be taken to get them off of the list, would serve both the state water quality agencies' requirements under the CWA and the WSR Act's goal of working with state agencies to diminish water pollution in WSRs.

Unassessed Wild and Scenic Rivers

In addition to improving waters that are impaired, it is important to work with states to improve water quality assessments on WSRs that have little water quality data provided in their state

[32] United States Environmental Protection Agency (EPA). 2015. Memorandum: Information concerning 2016 Clean Water Act sections 303(d), 305(b), and 314 integrated reporting and listing decisions.
[33] American Rivers. 2017. American Rivers (Hydrological Alteration) website. Available at: https://s3.amazonaws.com/american-rivers-website/wp-content/uploads/2017/08/18152547/HA-Fact-Sheet-08-18-17.pdf (accessed 23 January 2018).
[34] Pennsylvania Department of Environmental Protection. 2016. 2016 integrated report viewer. GIS Data and Metadata. Distributed by Pennsylvania Department of Environmental Protection, Harrisburg, Pennsylvania. Available at: http://www.depgis.state.pa.us/integratedreport/index.html (accessed 23 January 2018).
[35] State of Oregon Department of Environmental Quality. 2014. Water quality assessment- Oregon's 2012 integrated report assessment database and 303(d) list. Database. Distributed by State of Oregon Department of Environmental Quality, Portland, Oregon. Available at: http://www.deq.state.or.us/wq/assessment/rpt2012/search.asp (accessed 23 January 2018).
[36] The exception to this statement is Category 5-alternative waters, which are waters on the 303(d) list that have an official restoration strategy being pursued. There are no WSR segments with Category 5-alternative impairments.

reports. 38.0% of WSR miles were considered to have unknown water quality or were unassessed based on their state's most recent water quality report. Working with states to collect water quality data related to state water quality standards, and expanding water quality monitoring to include currently unassessed WSR reaches, will assist both the goals of the WSR Act and the CWA.

Looking Beyond Wild and Scenic River Boundaries

WSRs are not isolated resources and are susceptible to a multitude of water quality stressors that originate outside their designated corridors. Effective protection and enhancement of WSRs entails looking beyond their designated corridors and considering the health of their tributaries, catchments, and watersheds. Improving the health of watersheds has been shown to positively influence the water quality of rivers.[37] Utilizing a watershed approach to protect and enhance WSR water quality could be effective in developing strategic approaches to address sources of water quality impairments, while also identifying areas and supporting actions by communities that have been successful in protecting and enhancing the quality of water flowing into WSRs.

Outstanding National Resource Water Designation

Tier 3 waters, or Outstanding National Resource Waters (ONRWs), are waters where state's ordinary designated uses are not sufficient or appropriate. They are provided the highest level of protection, as water quality is not allowed to be lowered in ONRWs unless it is temporary and short-term. Before temporary degradation occurs, there must be an approved plan for how water quality will be restored. No new or increased discharges to ONRWs or their tributaries are allowed after a waterbody becomes an ONRW. Based on the EPA's water quality standards, "where high quality waters constitute an outstanding National resource, such as waters of National and State park and wildlife refuges and water of exceptional recreational or ecological significance, that water quality must be maintained and protected."[38] This theme of protecting the water quality in waterbodies of national significance aligns harmoniously with the basic principles of the WSR Act. In fact, the "protect and enhance" language of section 10(a) of the WSR Act is interpreted as a "non-degradation and enhancement policy for all designated river areas" under the 1982 Interagency Guidelines.[39] Despite the non-degradation policy, only 48 WSRs have been identified by their respective states as having Tier 2½ or Tier 3 protection, and 62.5% of them are impaired. More work is needed to better understand the opportunities and limitations that designation by states of WSRs as ONRWs can have to effectively protect the water quality of a WSR.

[37] United States Environmental Protection Agency (EPA). 2012. Identifying and protecting healthy watersheds: Concepts, assessments, and management approaches (EPA 841-B-11-002).
[38] 40 C.F.R. 131.12.
[39] 47 F.R. 39454.

CONCLUSIONS

This report demonstrates that impaired water quality is a widespread concern throughout the National WSR System, and more work is needed to develop viable strategies to address this problem. Although one purpose of WSR designation is to protect water quality, many WSRs are not meeting their assigned water quality standards under the CWA. In some instances, water quality impairments diminish all three river values that the WSR Act aims to protect and enhance: a river's free-flowing condition, water quality, and ORVs. New strategies to explore may include the following:

- Strengthen interagency efforts to improve water quality in WSRs.
- Assist partners and local communities in identifying projects and funding opportunities that protect and enhance WSR water quality.
- Support state agencies in their efforts to remove and restore WSRs that are on the 303(d) list.
- Encourage states to address impairments not caused by pollutants, such as hydrologic alteration, to better protect a WSR's free-flowing character, water quality, and ORVs.
- Expand water quality monitoring on WSRs to fill in data gaps and provide states accurate and comprehensive water quality information.
- Utilize a WSR watershed framework to identify and manage for outside influences on WSR water quality.
- Explore the benefits and limitations of increasing efforts to designate WSRs as ONRWs and to better implement the ONRW policy.

From the far reaches of untamed Alaska to the urban coast of Florida, the National WSR System represents a diverse set of special resources that benefit from, and often rely upon, clean water. Looking ahead, we must work together to protect WSR water quality for the generations to come, and remember that protection of our most special rivers does not end at designation.

LIST OF ABBREVIATIONS

ATTAINS: Assessment and TMDL Tracking and Implementation System

BLM: Bureau of Land Management

CWA: Clean Water Act

DU: Designated Use

EPA: Environmental Protection Agency

IWSRCC: Interagency Wild and Scenic River Coordinating Council

NPS: National Park Service

ONRW: Outstanding National Resource Water

ORV: Outstandingly Remarkable Value

PCBs: Polychlorinated Biphenyls

TMDL: Total Maximum Daily Load

USFS: U.S. Forest Service

USFWS: U.S. Fish and Wildlife Service

WSR Act: Wild and Scenic Rivers Act

WSR: Wild and Scenic River

APPENDIX: WATER QUALITY DETAILS

Table 4: Water quality status of rivers in the National WSR System.

River	Agency	Reporting Year	Miles by Water Quality Classification				Impairment(s) Along WSR, as Defined by State[40]
			Good	*Impaired*	*Unknown*	*Unassessed*	
Alagnak, Alaska	NPS	2014/2016	0	0	0	71.6	-
Alatna, Alaska	NPS	2014/2016	0	0	0	87.2	-
Allagash, Maine	State of Maine	2016	83.5	0	0	21.8	-
Allegheny, Pennsylvania	USFS	2016	12.3	80.3	0	0	Mercury
Amargosa, California	BLM	2014/2016	0	19.4	3.3	0	Arsenic
Andreafsky, Alaska	USFWS	2014/2016	0	0	0	275.5	-
Aniakchak, Alaska	NPS	2014/2016	0	0	0	80.4	-

[40] In instances where there are multiple impairments listed, each impairment is not necessarily attributed to the entire impaired portion of WSR. Not all impairments are on the 303(d) list.

River	Agency	Reporting Year	Miles by Water Quality Classification				Impairment(s) Along WSR, as Defined by State[40]
			Good	*Impaired*	*Unknown*	*Unassessed*	
Au Sable, Michigan	USFS	2016	0	21.7	0	0	PCB in Water Column
Battle Creek, Idaho	BLM	2014	0	24.2	0	0	Temperature, Water
Bautista Creek, California	USFS	2014/2016	0	0	0	10.9	-
Bear Creek, Michigan	USFS	2016	0	8.2	0	0	PCB in Water Column; Mercury in Water Column
Beaver, Alaska	BLM, USFWS	2014/2016	0	0	0	127.2	-
Big and Little Darby Creeks, Ohio	State of Ohio	2016	0	86.2	0	0	Natural Conditions (Flow or Habitat); PCBs; E. coli; Sedimentation/Siltation; Alteration in Stream-Side or Littoral Vegetative Covers
Big Jacks Creek, Idaho	BLM	2014	15.4	20.4	0	0	Combined Biota/Habitat Bioassessments
Big Marsh Creek, Oregon	USFS	2012	0	17.7	0	0	Temperature
Big Piney Creek, Arkansas	USFS	2016	0	0	42.2	0	-

River	Agency	Reporting Year	Miles by Water Quality Classification				Impairment(s) Along WSR, as Defined by State[40]
			Good	*Impaired*	*Unknown*	*Unassessed*	
Big Sur, California	USFS	2014/2016	0	0	7	13.2	-
Birch Creek, Alaska	BLM	2014/2016	0	110.8	0	0	Turbidity
Black Butte, California	USFS	2014/2016	0	22	0	0	Temperature, Water
Black Creek, Mississippi	USFS	2016	0	21.8	0	0	Fecal Coliform
Black, Michigan	USFS	2016	13.9	0	0	0	-
Bluestone, West Virginia	NPS	2016	0	13.4	0	0	PCBs; Fecal Coliform; Conditions Not Allowable- Biological (or EPA's parent definition, 'Impaired Biota')
Bruneau, Idaho	BLM	2016	39.8	0	0	0	-
Buffalo, Arkansas	USFS	2016	11.9	0	0	4.4	-
Cache la Poudre, Colorado	USFS, NPS	2016	47.3	36	0	0	Arsenic; Bugs (or EPA's parent definition, 'Impaired Biota')

River	Agency	Reporting Year	Miles by Water Quality Classification				Impairment(s) Along WSR, as Defined by State[40]
			Good	*Impaired*	*Unknown*	*Unassessed*	
Carp, Michigan	USFS	2016	30.5	0.2	0	0	Mercury in Water Column
Charley, Alaska	NPS	2014/2016	0	0	0	241.8	-
Chattooga, Georgia, North Carolina, South Carolina	USFS	2016, 2014, 2016	46.3	10.9	0	0	Fish Tissue Mercury; Hydrogen Ion Concentration
Chetco, Oregon	USFS	2012	0	46	0	0	Temperature; Biological Criteria (or EPA's parent definition, 'Impaired Biota')
Chilikadrotna, Alaska	NPS	2014/2016	0	0	0	14.2	-
Clackamas, Oregon	USFS	2012	0	49.8	0	0	Lead; Biological Criteria (or EPA's parent definition, 'Impaired Biota'); Mercury
Clarion, Pennsylvania	USFS	2016	53.4	0	0	0	-
Clarks Fork, Wyoming	USFS	2014	0	0	0	23.5	-
Collawash, Oregon	USFS	2012	0	12.9	0	6.7	Temperature

River	Agency	Reporting Year	Miles by Water Quality Classification				Impairment(s) Along WSR, as Defined by State[40]
			Good	*Impaired*	*Unknown*	*Unassessed*	
Cossatot, Arkansas	State of Arkansas, USFS	2016	26.2	0	0	0	-
Cottonwood Creek, California	USFS, BLM	2014/2016	0	0	0	21.9	-
Cottonwood Creek, Idaho	BLM	2014	0	0	2.5	0	-
Crescent Creek, Oregon	USFS	2012	0	7.5	0	3.4	Temperature
Crooked, Oregon	BLM	2012	0	18.1	0	0	Biological Criteria (or EPA's parent definition, 'Impaired Biota'); Dissolved Oxygen; Total Dissolved Gas; pH; Flow Modification; E. coli; Temperature
Deep Creek, Idaho	BLM	2014	0	13.5	0	0	Sedimentation/Siltation; Temperature, Water
Delaware (Lower), Pennsylvania, New Jersey	NPS Partnership	2016, 2014	25.7	44.1	0	0	Mercury; PCB in Fish Tissue; Aluminum; Mercury in Fish Tissue; pH; DDT in Fish Tissue; Chlordane in Fish Tissue; Turbidity; Water/Flow Variability; Siltation; Other Habitat Alterations; Cause Unknown
Delaware (Middle), Pennsylvania, New Jersey	NPS	2016, 2014	0	41.7	0	0	Mercury; DDT and Its Metabolites in Fish Tissue; Chlordane in Fish Tissue; Mercury in Fish Tissue; pH; PCB in Fish Tissue; Aluminum

River	Agency	Reporting Year	Miles by Water Quality Classification				Impairment(s) Along WSR, as Defined by State[40]
			Good	*Impaired*	*Unknown*	*Unassessed*	
Delaware (Upper), New York, Pennsylvania	NPS	2016, 2016	0	73.8	0	0	Mercury; Threatened by: Nutrients (Phosphorus); Other Pollutants (Various); Pathogens
Delta, Alaska	BLM	2014/2016	0	0	0	57.7	-
Deschutes, Oregon	USFS, BLM	2012	0	174	0	0	Dissolved Oxygen; Temperature; Flow Modification; Turbidity; Habitat Modification; Sedimentation; pH; Chlorophyll A
Dickshooter Creek, Idaho	BLM	2014	0	0	0	9.5	-
Donner und Blitzen, Oregon	BLM	2012	17.1	70.5	0	4.3	Temperature
Duncan Creek, Idaho	BLM	2014	0.9	0	0	0	-
Eagle Creek (Mt. Hood), Oregon	USFS	2012	0	8.4	0	0	Biological Criteria (or EPA's parent definition, 'Impaired Biota'); Temperature
Eagle Creek (Wallowa-Whitman), Oregon	USFS	2012	17.8	10.5	0	0.8	E. coli
East Branch Tahquamenon, Michigan	USFS	2016	0	14.9	0	0	PCB in Water Column

River	Agency	Reporting Year	Miles by Water Quality Classification				Impairment(s) Along WSR, as Defined by State[40]
			Good	*Impaired*	*Unknown*	*Unassessed*	
East Fork Hood, Oregon	USFS	2012	0	14.1	0	0	Iron; Copper; Thallium; Biological Criteria (or EPA's parent definition, 'Impaired Biota'); Temperature
East Fork Jemez, New Mexico	USFS	2016/2018	0	11	0	0	Aluminum, Chronic; Temperature
Eel, California	Round Valley Indian Reservation, State of California, USFS, BLM	2014/2016	0	397.3	0	0	Aluminum; Oxygen, Dissolved; Sedimentation/Siltation; Temperature, Water
Eightmile, Connecticut	NPS Partnership	2016	14.3	10.8	0	0	E. coli
Eleven Point, Missouri	USFS	2018	0	45.3	0	0	Mercury in Fish Tissue
Elk, Oregon	USFS	2012	6	17.2	0	5.1	Temperature; Habitat Modification
Elkhorn Creek, Oregon	USFS, BLM	2012	0	7.1	0	0	Temperature
Feather, California	USFS	2014/2016	0	80.3	0	0	Unknown Toxicity

River	Agency	Reporting Year	Miles by Water Quality Classification				Impairment(s) Along WSR, as Defined by State[40]
			Good	*Impaired*	*Unknown*	*Unassessed*	
Fifteenmile Creek, Oregon	USFS	2012	0	10.8	0	0	Temperature; Sedimentation; Habitat Modification
Fish Creek, Oregon	USFS	2012	0	13.6	0	0	Temperature; Habitat Modification
Flathead, Montana	USFS, NPS	2016	202.9	0	9.6	0	-
Fortymile, Alaska	BLM	2014/2016	0	0	39.8	357.9	-
Fossil Creek, Arizona	USFS	2016	17.4	0	0	0	-
Fuller Mill Creek, California	USFS	2014/2016	3.3	0	0	0	-
Grande Ronde, Oregon	USFS, BLM	2012	0	43.1	0	0	Sedimentation; Habitat Modification; Temperature; Dissolved Oxygen
Great Egg Harbor, New Jersey	NPS Partnership	2014	4.8	134.3	0	8.3	pH; Copper; Arsenic; Mercury in Fish Tissue; Mercury in Water Column; Total Coliform; E. coli; Dissolved Oxygen; PCB in Fish Tissue
Gulkana, Alaska	BLM	2014/2016	0	0	46.4	123.9	-

River	Agency	Reporting Year	Miles by Water Quality Classification				Impairment(s) Along WSR, as Defined by State[40]
			Good	*Impaired*	*Unknown*	*Unassessed*	
Horsepasture, North Carolina	USFS	2014	0	4.5	0	0	Fish Tissue Mercury
Hurricane Creek, Arkansas	USFS	2016	16	0	0	0	-
Illabot, Washington	USFS	2016	0	0	0	14.1	-
Illinois, Oregon	USFS	2012	0	49.9	0	0	Temperature; Flow Modification
Imnaha, Oregon	USFS	2012	0	73.3	0	9.5	Biological Criteria (or EPA's parent definition, 'Impaired Biota'); Temperature
Indian, Michigan	USFS	2016	0	49.9	0	0	PCB in Water Column
Ivishak, Alaska	USFWS	2014/2016	0	0	0	69.3	-
Jarbidge, Idaho	BLM	2014	29.6	0	0	0	-
John Day, Oregon	BLM	2012	0	147.4	0	0	Copper; Biological Criteria (or EPA's parent definition, 'Impaired Biota'); Temperature

River	Agency	Reporting Year	Miles by Water Quality Classification				Impairment(s) Along WSR, as Defined by State[40]
			Good	*Impaired*	*Unknown*	*Unassessed*	
John, Alaska	NPS	2014/2016	0	0	0	61.7	-
Joseph Creek, Oregon	USFS	2012	0	9.4	0	0	Temperature
Kern, California	USFS, NPS	2014/2016	33.4	0	0	123.7	-
Kings, California	USFS, NPS	2014/2016	6.5	0	28.3	54	-
Klamath, California	State of California, Hoopa Valley Indian Reservation, USFS, BLM, NPS	2014/2016	0	293.2	0	0	Cyanobacteria Hepatotoxic Microcystins; Nutrients; Organic Enrichment/Low Dissolved Oxygen; Oxygen, Dissolved; Sediment; Sedimentation/Siltation; Aluminum; Temperature; Biostimulatory Conditions; pH
Klamath, Oregon	State of Oregon, BLM	2012	0	11.1	0	0	Dissolved Oxygen; Arsenic; Temperature
Klickitat, Washington	USFS	2016	0.6	2.2	0	8.3	Temperature; Dissolved Oxygen
Kobuk, Alaska	NPS	2014/2016	0	0	0	118.5	-

River	Agency	Reporting Year	Miles by Water Quality Classification				Impairment(s) Along WSR, as Defined by State[40]
			Good	*Impaired*	*Unknown*	*Unassessed*	
Lamprey, New Hampshire	NPS Partnership	2016	0	23	0	0	Mercury; Ammonia (Total); pH; E. coli; Dissolved Oxygen Saturation; Oxygen, Dissolved; Phosphorus (Total); Total Suspended Solids (TSS)
Little Beaver Creek, Ohio	State of Ohio	2016	0	32.2	0	0	E. coli; Flow Alteration; Natural Limits (Wetlands); Nutrients; Organic Enrichment/Low DO; Siltation; Unionized Ammonia; PCBs; Direct Habitat Alterations; Oil and Grease; Pesticides; Salinity/TDS/Chlorides; Cause Unknown
Little Deschutes, Oregon	USFS	2012	0	13.8	0	0	Temperature
Little Jacks Creek, Idaho	BLM	2014	12.5	0	0	0	-
Little Miami, Ohio	State of Ohio	2016	0	93	0	0	Natural Conditions (Flow or Habitat); PCBs; E. coli; Organic Enrichment (Sewage) Biological Indicators; Sedimentation/Siltation
Little Missouri, Arkansas	USFS	2016	15.5	0	0	0	-
Lostine, Oregon	USFS	2012	17.4	0	0	0	-
Lower American, California	State of California	2014/2016	0	22.8	0	0	Mercury; PCBs; Toxicity; Bifenthrin; Indicator Bacteria; Pyrethroids

River	Agency	Reporting Year	Miles by Water Quality Classification				Impairment(s) Along WSR, as Defined by State[40]
			Good	*Impaired*	*Unknown*	*Unassessed*	
Loxahatchee, Florida	State of Florida	2016	0	3.4	0	4	Mercury (in Fish Tissue); Fecal Coliform; Nutrients (Chlorophyll-a)
Lumber, North Carolina	State of North Carolina	2014	0	72.8	0	5.7	Fish Tissue Mercury
Malheur, Oregon	USFS	2012	0	12.4	0	0	Temperature; Arsenic; Dissolved Oxygen
Manistee, Michigan	USFS	2016	0	29.1	0	0	PCB in Water Column
Maurice, New Jersey	NPS Partnership	2014	0	47.6	0	0	Arsenic; PCB in Fish Tissue; Mercury in Water Column; Mercury in Fish Tissue; E. coli; Total Coliform; Enterococcus; Dissolved Oxygen; Phosphorus; DDT in Fish Tissue; Dioxin
Mckenzie, Oregon	USFS	2012	0	14	0	0	Lead; Mercury
Merced, California	USFS, NPS, BLM	2014/2016	28.7	0	0	103.5	-
Metolius, Oregon	USFS	2012	0	31.2	0	0	Temperature

River	Agency	Reporting Year	Miles by Water Quality Classification				Impairment(s) Along WSR, as Defined by State[40]
			Good	*Impaired*	*Unknown*	*Unassessed*	
Middle Fork Clearwater, Idaho	USFS	2014	80.8	67.1	41.8	0	Temperature
Middle Fork Hood, Oregon	USFS	2012	0	3.7	0	0	Iron; Biological Criteria (or EPA's parent definition, 'Impaired Biota'); Temperature
Middle Fork Salmon, Idaho	USFS	2014	0	0	105.7	0	-
Middle Fork Snoqualme, Washington	USFS	2016	0	3.8	0	21.5	Temperature
Middle Fork Vermilion, Illinois	State of Illinois	2016	7.2	9.3	0	0	Fecal Coliform
Minam, Oregon	USFS	2012	0	41.6	0	0.8	Copper; Sedimentation; Temperature
Missisquoi & Trout, Vermont	NPS Partnership	2016	44.3	0	0	1.8	-
Missouri, Montana	BLM	2016	0	150.4	0	0	Alteration in Stream-Side or Littoral Vegetative Covers; Physical Substrate Habitat Alterations; Arsenic; Copper; Lead
Missouri, Nebraska & South Dakota	NPS	2016, 2016	0	122.3	0	0	Mercury in Fish Tissue; Mercury; E. coli; Selenium; Impaired Aquatic Community

River	Agency	Reporting Year	Miles by Water Quality Classification				Impairment(s) Along WSR, as Defined by State[40]
			Good	*Impaired*	*Unknown*	*Unassessed*	
Mulberry, Arkansas	USFS	2016	5.1	45.2	0	7	pH
Mulchatna, Alaska	NPS	2014/2016	0	0	25.3	0	-
Musconetcong, New Jersey	NPS Partnership	2014	2.4	22.5	0	0	Temperature; E. coli; Fecal Coliform; Arsenic; pH
New, North Carolina	State of North Carolina	2014	0	26.7	0	0	Fish Tissue Mercury
Niobrara, Nebraska	NPS, USFWS	2016	46.3	29	0	0	E. coli
Noatak, Alaska	NPS	2014/2016	0	0	0	352.1	-
North Fork American, California	USFS, BLM	2014/2016	0	38.3	0	0	Mercury
North Fork Crooked, Oregon	USFS, BLM	2012	0	33.8	0	0	Biological Criteria (or EPA's parent definition, 'Impaired Biota'); Temperature; Flow Modification
North Fork John Day, Oregon	USFS	2012	0	56.5	0	0	Temperature

River	Agency	Reporting Year	Miles by Water Quality Classification				Impairment(s) Along WSR, as Defined by State[40]
			Good	*Impaired*	*Unknown*	*Unassessed*	
North Fork Koyukuk, Alaska	NPS	2014/2016	0	0	0	117.6	-
North Fork Malheur, Oregon	USFS	2012	0	26.6	0	0	E. coli; Temperature; Biological Criteria (or EPA's parent definition, 'Impaired Biota'); Flow Modification
North Fork Middle Fork Willamette, Oregon	USFS	2012	15.6	28.5	0	0	Temperature
North Fork Owyhee, Idaho	BLM	2014	0	22	0	0	Low Flow Alteration; Temperature, Water
North Fork Owyhee, Oregon	BLM	2012	0	9.7	0	0	Temperature
North Fork San Jacinto, California	USFS	2014/2016	9.9	0	0	0	-
North Fork Smith, Oregon	USFS	2012	0	0	12.9	0.6	-
North Fork Sprague, Oregon	USFS	2012	0	16.8	0	0	Temperature
North Powder, Oregon	USFS	2012	0	5.9	0	0	E. coli

River	Agency	Reporting Year	Miles by Water Quality Classification				Impairment(s) Along WSR, as Defined by State[40]
			Good	*Impaired*	*Unknown*	*Unassessed*	
North Sylamore Creek, Arkansas	USFS	2016	13.7	0	0	0	-
North Umpqua, Oregon	USFS, BLM	2012	0	33.6	0	0	Temperature; Flow Modification; Arsenic
Nowitna, Alaska	USFWS	2014/2016	0	0	0	220.6	-
Obed, Tennessee	NPS	2016	28.5	17.2	0	0	Phosphorus (Total); Nitrate/Nitrite (Nitrite + Nitrate as N); Oil
Ontonagon, Michigan	USFS	2016	0	171.3	0	0	PCB in Water Column; Mercury in Water Column
Owens River Headwaters, California	USFS	2014/2016	0	0	0.9	17.3	-
Owyhee, Idaho	BLM	2014	69.7	0	0	0	-
Owyhee, Oregon	BLM	2012	0	115.3	0	0	Temperature; Mercury; Arsenic
Paint, Michigan	USFS	2016	0	52.7	0	0	PCB in Water Column; Mercury in Water Column

River	Agency	Reporting Year	Miles by Water Quality Classification				Impairment(s) Along WSR, as Defined by State[40]
			Good	*Impaired*	*Unknown*	*Unassessed*	
Palm Canyon Creek, California	USFS	2014/2016	0	0	0	8.5	-
Pecos, New Mexico	USFS	2016/2018	21.4	0	0	0	-
Pere Marquette, Michigan	USFS	2016	0	60.6	0	0	PCB in Fish Tissue; PCB in Water Column; Mercury in Water Column
Pine, Michigan	USFS	2016	0	25.2	0	0	PCB in Water Column
Piru Creek, California	USFS	2014/2016	0	7.2	0	0	Chloride; pH; Toxicity
Powder, Oregon	BLM	2012	0	11.8	0	0	E. coli; Dissolved Oxygen; Arsenic; Temperature; Flow Modification
Pratt, Washington	USFS	2016	0	0	0	10.4	-
Presque Isle, Michigan	USFS	2016	72.8	0	0	0	-
Quartzville Creek, Oregon	BLM	2012	0	9.5	0	0	Temperature

River	Agency	Reporting Year	Miles by Water Quality Classification				Impairment(s) Along WSR, as Defined by State[40]
			Good	*Impaired*	*Unknown*	*Unassessed*	
Rapid, Idaho	USFS	2014	30.7	0	0	0	-
Red Canyon, Idaho	BLM	2014	0	4.7	0	0	Temperature, Water; Other Flow Regime Alterations
Red, Kentucky	USFS	2014	9.5	5	0	4.8	Habitat Assessments (Stream); Sedimentation/Siltation
Richland Creek, Arkansas	USFS	2016	18.2	0	0	0	-
Rio Chama, New Mexico	USFS, BLM	2016/2018	25	0	0	0	-
Rio De La Mina, Puerto Rico	USFS	2016	0	2.1	0	0	Fecal Coliforms
Rio Grande, New Mexico	USFS, BLM	2016/2018	27.2	38.9	0	0	PCB in Fish Tissue; Turbidity; pH; Temperature
Rio Grande, Texas	NPS	2014	0	196.9	0	0	Chloride; Sulfate; Total Dissolved Solids
Rio Icacos, Puerto Rico	USFS	2016	0	4.4	0	0	Fecal Coliforms; Low Dissolved Oxygen; Turbidity

River	Agency	Reporting Year	Miles by Water Quality Classification				Impairment(s) Along WSR, as Defined by State[40]
			Good	*Impaired*	*Unknown*	*Unassessed*	
Rio Mameyes, Puerto Rico	USFS	2016	0	5.9	0	0	Fecal Coliforms
River Styx, Oregon	NPS	2012	0	0	0	0.2	-
Roaring, Oregon	USFS	2012	14.1	0	0	0	-
Rogue, Oregon	USFS, BLM	2012	0	83.8	0	0	Fecal Coliform; Temperature; Mercury; Dissolved Oxygen; pH
Saint Joe, Idaho	USFS	2014	60.2	10.6	0	0	Temperature, Water
Saline Bayou, Louisana	USFS	2016	0	24.3	0	0	Mercury in Fish Tissue
Salmon, Alaska	NPS	2014/2016	0	0	0	76.5	-
Salmon, Idaho	USFS	2014	84.4	0	38.2	0	-
Salmon, Oregon	USFS, BLM	2012	0	35	0	0	Biological Criteria (or EPA's parent definition, 'Impaired Biota'); Temperature

River	Agency	Reporting Year	Miles by Water Quality Classification				Impairment(s) Along WSR, as Defined by State[40]
			Good	*Impaired*	*Unknown*	*Unassessed*	
Sandy, Oregon	USFS, BLM	2012	0	24.2	0	0	Temperature
Selawik, Alaska	USFWS	2014/2016	0	0	0	181.3	-
Sespe Creek, California	USFS	2014/2016	0	29.7	0	0	Chloride; pH
Sheenjek, Alaska	USFWS	2014/2016	0	0	195.6	0	-
Sheep Creek, Idaho	BLM	2014	26.2	0	0	0	-
Sipsey Fork of the West Fork, Alabama	USFS	2016	65.8	0	0	0	-
Sisquoc, California	USFS	2014/2016	0	34.7	0	0	pH
Skagit, Washington	USFS	2016	8.5	0	0	150	-
Smith, California	State of California, USFS	2014/2016	382.8	0	4.5	19.8	-

River	Agency	Reporting Year	Miles by Water Quality Classification				Impairment(s) Along WSR, as Defined by State[40]
			Good	*Impaired*	*Unknown*	*Unassessed*	
Snake River Headwaters, Wyoming	USFS, NPS	2014	0	0	0	407.6	-
Snake, Idaho & Oregon	USFS	2014, 2012	0	68	0	0	Mercury; Temperature; Temperature, Water; Total Dissolved Gas; Dissolved Gas Supersaturation
South Fork Clackamas, Oregon	USFS	2012	4.3	0	0	0	-
South Fork John Day, Oregon	BLM	2012	0	46.9	0	0	Temperature; Biological Criteria (or EPA's parent definition, 'Impaired Biota')
South Fork Owyhee, Idaho	BLM	2014	0	32.8	0	0	Temperature, Water; Other Flow Regime Alterations
South Fork Roaring, Oregon	USFS	2012	0	0	0	5	-
St. Croix, Wisconsin, Minnesota	States of Wisconsin and Minnesota, NPS	2018, 2018	120.8	129	6.3	0	PCB in Fish Tissue; PCBs; Mercury in Fish Tissue; Total Phosphorus; Nutrient/Eutrophication Biological Indicators
Sturgeon (Hiawatha National Forest), Michigan	USFS	2016	0	40.9	0	0	PCB in Water Column; Mercury in Water Column
Sturgeon (Ottawa National Forest), Michigan	USFS	2016	27.9	0	0	0	-

River	Agency	Reporting Year	Miles by Water Quality Classification				Impairment(s) Along WSR, as Defined by State[40]
			Good	*Impaired*	*Unknown*	*Unassessed*	
Sudbury, Assabet and Concord, Massachusetts	NPS Partnership	2016	0	30.7	0	0	Mercury in Fish Tissue; Non-Native Aquatic Plants; Escherichia coli; Eurasian Water Milfoil, Myriophylum spicatum; Fecal Coliform; Phosphorus (Total)
Sycan, Oregon	USFS	2012	8.1	55.2	0	0	Temperature
Taunton, Massachusetts	NPS Partnership	2016	0	38	0	0	Fishes Bioassessments (or EPA's parent definition, 'Impaired Biota'); Oxygen, Dissolved; Fecal Coliform; Enterococcus; Escherichia coli
Tinayguk, Alaska	NPS	2014/2016	0	0	0	52.4	-
Tlikakila, Alaska	NPS	2014/2016	0	0	0	56.9	-
Trinity, California	State of California, Hoopa Valley Indian Reservation, USFS, BLM	2014/2016	0	206.5	0	0	Sedimentation/Siltation; Temperature, Water
Tuolumne, California	USFS, NPS, BLM	2014/2016	0	0	37.5	47.7	-
Unalakleet, Alaska	BLM	2014/2016	0	0	0	31.2	-

River	Agency	Reporting Year	Miles by Water Quality Classification				Impairment(s) Along WSR, as Defined by State[40]
			Good	*Impaired*	*Unknown*	*Unassessed*	
Upper Rogue, Oregon	USFS	2012	0	41.7	0	0	Mercury
Verde, Arizona	USFS	2016	0	0	21.4	19.4	-
Virgin, Utah	NPS, BLM	2016	25.1	137.5	7.4	1.9	OE Bioassessments (or EPA's parent definition, 'Impaired Biota'); pH: Temperature; E. coli
Wallowa, Oregon	State of Oregon, BLM	2012	0	10.2	0	0	E. coli; pH; Temperature; Sedimentation; Habitat Modification; Flow Modification; Dissolved Oxygen; Fecal Coliform
Wekiva, Florida	NPS Partnership	2016	0	24.9	0	19.5	Mercury (in Fish Tissue); Nutrients (Other Information); Dissolved Oxygen
Wenaha, Oregon	USFS	2012	11.5	10.4	0	0	Temperature
West Branch Farmington, Connecticut	NPS Partnership	2016	13.7	0	0	0	-
West Fork Bruneau, Idaho	BLM	2014	0.3	0	0	0	-
West Little Owyhee, Oregon	BLM	2012	0	0	7.1	51.6	-

River	Agency	Reporting Year	Miles by Water Quality Classification				Impairment(s) Along WSR, as Defined by State[40]
			Good	*Impaired*	*Unknown*	*Unassessed*	
Westfield, Massachusetts	State of Mass-achusetts	2016	32	38.2	0	15.6	Enterococcus; Temperature, Water
White Clay, Delaware, Pennsylvania	NPS Partnership	2016, 2016	0	127.8	0	34.4	Mercury; Nutrients; Organic Enrichment/Low D.O.; Pathogens; Bacteria; Siltation; Water/Flow Variability; Habitat; Other Habitat Alterations; Suspended Solids; Biology (or EPA's parent definition, 'Impaired Biota'); PCBs; Pesticides; Dieldrin
White Salmon, Washington	USFS	2016	9.1	0	0	21.4	-
White, Oregon	USFS, BLM	2012	0	11.8	34.8	2	Temperature
Whitefish, Michigan	USFS	2016	35.4	0	0	0	-
Whychus Creek, Oregon	USFS	2012	0	20.6	0	37	Biological Criteria (or EPA's parent definition, 'Impaired Biota'); Temperature
Wickahoney Creek, Idaho	BLM	2014	1.5	0	0	0	-
Wildcat, New Hampshire	USFS	2016	0	15.5	0	0	Mercury; Lead; pH; E. coli

River	Agency	Reporting Year	Miles by Water Quality Classification				Impairment(s) Along WSR, as Defined by State[40]
			Good	*Impaired*	*Unknown*	*Unassessed*	
Wildhorse and Kinger Creeks, Oregon	BLM	2012	7	2.6	4.2	0	Temperature
Wilson Creek, North Carolina	USFS	2014	0	23.5	0	0	Fish Tissue Mercury
Wind, Alaska	USFWS	2014/2016	0	0	0	118.3	-
Wolf, Wisconsin	Menominee Indian Reservation	2016	23.8	0	0	0	-
Yellow Dog, Michigan	USFS	2016	0	4.1	0	0	Mercury in Water Column
Zig Zag, Oregon	USFS	2012	4.9	0	0	0	-

Table 5: WSRs with impairments on the 303(d) list.

River	Agency	Reporting Year	Impairment(s) on 303(d) List
Allegheny, Pennsylvania	USFS	2016	Mercury
Amargosa, California	BLM	2014/2016	Arsenic
Au Sable, Michigan	USFS	2016	PCB in Water Column
Bear Creek, Michigan	USFS	2016	PCB in Water Column; Mercury in Water Column
Big and Little Darby Creeks, Ohio	State of Ohio	2016	PCBs; E. coli
Big Jacks Creek, Idaho	BLM	2014	Combined Biota/Habitat Bioassessments
Big Marsh Creek, Oregon	USFS	2012	Temperature
Bluestone, West Virginia	NPS	2016	PCBs
Cache la Poudre, Colorado	USFS, NPS	2016	Arsenic; Bugs (or EPA's parent definition, 'Impaired Biota')
Carp, Michigan	USFS	2016	Mercury in Water Column
Chattooga, Georgia, North Carolina, South Carolina	USFS	2016, 2014, 2016	Hydrogen Ion Concentration

River	Agency	Reporting Year	Impairment(s) on 303(d) List
Chetco, Oregon	USFS	2012	Temperature; Biological Criteria (or EPA's parent definition, 'Impaired Biota')
Clackamas, Oregon	USFS	2012	Lead; Biological Criteria (or EPA's parent definition, 'Impaired Biota'); Mercury
Crescent Creek, Oregon	USFS	2012	Temperature
Crooked, Oregon	BLM	2012	Biological Criteria (or EPA's parent definition, 'Impaired Biota'); Dissolved Oxygen; Total Dissolved Gas; pH; E. coli; Temperature
Delaware (Lower), Pennsylvania, New Jersey	NPS Partnership	2016, 2014	Mercury; PCB in Fish Tissue; Aluminum; Mercury in Fish Tissue; pH; DDT in Fish Tissue; Chlordane in Fish Tissue; Turbidity; Siltation; Cause Unknown
Delaware (Middle), Pennsylvania, New Jersey	NPS	2016, 2014	Mercury; DDT and Its Metabolites in Fish Tissue; Chlordane in Fish Tissue; Mercury in Fish Tissue; pH; PCB in Fish Tissue; Aluminum
Delaware (Upper), New York, Pennsylvania	NPS	2016, 2016	Mercury
Deschutes, Oregon	USFS, BLM	2012	Dissolved Oxygen; Temperature; Turbidity; Sedimentation; pH; Chlorophyll A
Donner und Blitzen, Oregon	BLM	2012	Temperature
Eagle Creek (Mt. Hood), Oregon	USFS	2012	Biological Criteria (or EPA's parent definition, 'Impaired Biota')
Eagle Creek (Wallowa-Whitman), Oregon	USFS	2012	E. coli
East Branch Tahquamenon, Michigan	USFS	2016	PCB in Water Column

River	Agency	Reporting Year	Impairment(s) on 303(d) List
East Fork Hood, Oregon	USFS	2012	Iron; Copper; Thallium; Biological Criteria (or EPA's parent definition, 'Impaired Biota')
East Fork Jemez, New Mexico	USFS	2016/2018	Aluminum, Chronic; Temperature
Eel, California	Round Valley Indian Reservation, State of California, USFS, BLM	2014/2016	Aluminum; Oxygen, Dissolved; Sedimentation/Siltation; Temperature, Water
Eleven Point, Missouri	USFS	2018	Mercury in Fish Tissue
Elk, Oregon	USFS	2012	Temperature
Feather, California	USFS	2014/2016	Unknown Toxicity
Fifteenmile Creek, Oregon	USFS	2012	Sedimentation
Grande Ronde, Oregon	USFS, BLM	2012	Sedimentation; Dissolved Oxygen
Great Egg Harbor, New Jersey	NPS Partnership	2014	pH; Copper; Arsenic; Mercury in Water Column; Dissolved Oxygen; PCB in Fish Tissue
Imnaha, Oregon	USFS	2012	Biological Criteria (or EPA's parent definition, 'Impaired Biota')
Indian, Michigan	USFS	2016	PCB in Water Column
John Day, Oregon	BLM	2012	Copper; Biological Criteria (or EPA's parent definition, 'Impaired Biota')

River	Agency	Reporting Year	Impairment(s) on 303(d) List
Klamath, California	State of California, Hoopa Valley Indian Reservation, USFS, BLM, NPS	2014/2016	Cyanobacteria Hepatotoxic Microcystins; Nutrients; Organic Enrichment/Low Dissolved Oxygen; Oxygen, Dissolved; Sediment; Sedimentation/Siltation; Aluminum; Temperature; Biostimulatory Conditions; pH
Klamath, Oregon	State of Oregon, BLM	2012	Dissolved Oxygen; Arsenic; Temperature
Klickitat, Washington	USFS	2016	Temperature; Dissolved Oxygen
Lamprey, New Hampshire	NPS Partnership	2016	pH; Dissolved Oxygen Saturation; Oxygen, Dissolved
Little Beaver Creek, Ohio	State of Ohio	2016	E. coli; PCBs
Little Deschutes, Oregon	USFS	2012	Temperature
Little Miami, Ohio	State of Ohio	2016	PCBs; E. coli; Sedimentation/Siltation
Lower American, California	State of California	2014/2016	Mercury; PCBs; Toxicity; Bifenthrin; Indicator Bacteria; Pyrethroids
Loxahatchee, Florida	State of Florida	2016	Fecal Coliform; Nutrients (Chlorophyll-a)
Malheur, Oregon	USFS	2012	Arsenic; Dissolved Oxygen
Manistee, Michigan	USFS	2016	PCB in Water Column
Maurice, New Jersey	NPS Partnership	2014	Arsenic; PCB in Fish Tissue; Mercury in Water Column; Dissolved Oxygen; Phosphorus; DDT in Fish Tissue; Dioxin

River	Agency	Reporting Year	Impairment(s) on 303(d) List
Mckenzie, Oregon	USFS	2012	Lead; Mercury
Metolius, Oregon	USFS	2012	Temperature
Middle Fork Clearwater, Idaho	USFS	2014	Temperature
Middle Fork Hood, Oregon	USFS	2012	Iron; Biological Criteria (or EPA's parent definition, 'Impaired Biota')
Middle Fork Vermilion, Illinois	State of Illinois	2016	Fecal Coliform
Minam, Oregon	USFS	2012	Copper; Sedimentation
Missouri, Montana	BLM	2016	Alteration in Stream-Side or Littoral Vegetative Covers; Physical Substrate Habitat Alterations; Arsenic; Copper; Lead
Missouri, Nebraska & South Dakota	NPS	2016, 2016	Mercury in Fish Tissue; Mercury; E. coli; Selenium; Impaired Aquatic Community
Musconetcong, New Jersey	NPS Partnership	2014	Temperature; Arsenic; pH
North Fork American, California	USFS, BLM	2014/2016	Mercury
North Fork Crooked, Oregon	USFS, BLM	2012	Biological Criteria (or EPA's parent definition, 'Impaired Biota'); Temperature
North Fork Malheur, Oregon	USFS	2012	Biological Criteria (or EPA's parent definition, 'Impaired Biota')

River	Agency	Reporting Year	Impairment(s) on 303(d) List
North Fork Owyhee, Oregon	BLM	2012	Temperature
North Powder, Oregon	USFS	2012	E. coli
North Umpqua, Oregon	USFS, BLM	2012	Temperature; Arsenic
Obed, Tennessee	NPS	2016	Phosphorus (Total); Nitrate/Nitrite (Nitrite + Nitrate as N); Oil
Ontonagon, Michigan	USFS	2016	PCB in Water Column; Mercury in Water Column
Owyhee, Oregon	BLM	2012	Temperature; Mercury; Arsenic
Paint, Michigan	USFS	2016	PCB in Water Column; Mercury in Water Column
Pere Marquette, Michigan	USFS	2016	Mercury in Water Column
Pine, Michigan	USFS	2016	PCB in Water Column
Piru Creek, California	USFS	2014/2016	Chloride; pH; Toxicity
Powder, Oregon	BLM	2012	E. coli; Dissolved Oxygen; Arsenic; Temperature
Red, Kentucky	USFS	2014	Habitat Assessments (Stream); Sedimentation/Siltation

River	Agency	Reporting Year	Impairment(s) on 303(d) List
Rio Grande, New Mexico	USFS, BLM	2016/2018	PCB in Fish Tissue; Turbidity; pH; Temperature
Rio Grande, Texas	NPS	2014	Chloride; Sulfate; Total Dissolved Solids
Rio Icacos, Puerto Rico	USFS	2016	Low Dissolved Oxygen; Turbidity
Rogue, Oregon	USFS, BLM	2012	Fecal Coliform; Mercury; Dissolved Oxygen; pH
Saline Bayou, Louisana	USFS	2016	Mercury in Fish Tissue
Salmon, Oregon	USFS, BLM	2012	Biological Criteria (or EPA's parent definition, 'Impaired Biota')
Sespe Creek, California	USFS	2014/2016	Chloride; pH
Sisquoc, California	USFS	2014/2016	pH
Snake, Idaho & Oregon	USFS	2014, 2012	Mercury; Temperature
South Fork John Day, Oregon	BLM	2012	Biological Criteria (or EPA's parent definition, 'Impaired Biota')
St. Croix, Wisconsin, Minnesota	States of Wisconsin and Minnesota, NPS	2018, 2018	PCB in Fish Tissue; PCBs
Sturgeon (Hiawatha National Forest), Michigan	USFS	2016	PCB in Water Column; Mercury in Water Column

River	Agency	Reporting Year	Impairment(s) on 303(d) List
Sudbury, Assabet and Concord, Massachusetts	NPS Partnership	2016	Mercury in Fish Tissue; Non-Native Aquatic Plants; Escherichia coli; Eurasian Water Milfoil, Myriophylum spicatum; Fecal Coliform
Taunton, Massachusetts	NPS Partnership	2016	Fishes Bioassessments (or EPA's parent definition, 'Impaired Biota'); Oxygen, Dissolved; Enterococcus; Escherichia coli
Trinity, California	State of California, Hoopa Valley Indian Reservation, USFS, BLM	2014/2016	Sedimentation/Siltation; Temperature, Water
Upper Rogue, Oregon	USFS	2012	Mercury
Virgin, Utah	NPS, BLM	2016	OE Bioassessments (or EPA's parent definition, 'Impaired Biota'); pH: Temperature; E. coli
Wallowa, Oregon	State of Oregon, BLM	2012	pH; Sedimentation; Dissolved Oxygen
Westfield, Massachusetts	State of Mass-achusetts	2016	Enterococcus; Temperature, Water
White Clay, Delaware, Pennsylvania	NPS Partnership	2016, 2016	Mercury; Habitat; Biology (or EPA's parent definition, 'Impaired Biota'); Dieldrin; Pathogens
White, Oregon	USFS, BLM	2012	Temperature
Whychus Creek, Oregon	USFS	2012	Biological Criteria (or EPA's parent definition, 'Impaired Biota'); Temperature
Wildcat, New Hampshire	USFS	2016	Lead; pH
Yellow Dog, Michigan	USFS	2016	Mercury in Water Column

Table 6: WSRs with Tier 2½ or Tier 3 antidegradation protection.

River[41]	Agency	Tier	State Designation	WSR Miles Designated	Total WSR Miles	General Description
Allagash, Maine	State of Maine	3	Maine Outstanding National Resource Water	64.1	105.3	*"Where high quality waters of the state constitute an **Outstanding National Resource Water**, that water quality must be maintained and protected."* (Maine Office of the Revisor of Statutes 2017)
Big and Little Darby Creeks, Ohio*	State of Ohio	2½	Ohio Outstanding State Water	86.2	86.2	*"'**Outstanding state waters**' are waters that have special significance for the state because of their exceptional ecological values or exceptional recreational values, and that have been so categorized pursuant to paragraph (E) of this rule."* (Ohio Environmental Protection Agency 2017)
Big Piney Creek, Arkansas	USFS	2½	Arkansas Outstanding Resource Water	42.2	42.2	*"Where high quality water constitute an **outstanding state or national resource**, such as those waters designated as extraordinary resource waters, ecologically sensitive, or natural and scenic waterways, those uses and water quality for which the outstanding waterbody was designated shall be protected by (1) water quality controls, (2) maintenance of natural flow regime, (3) protection of instream habitat, and (4) encouragement of land management practices protective of the watershed."* (Arkansas Pollution Control and Ecology Commission 2011)
Bluestone, West Virginia*	NPS	3	West Virginia Outstanding National Resource Water	11	13.4	*"**Outstanding National Resource Waters** are to be maintained, protected and improved where necessary."* (West Virginia Department of Environmental Protection)

[41] Asterisks indicate that antidegradation-protected sections of the listed WSR are impaired.

River[41]	Agency	Tier	State Designation	WSR Miles Designated	Total WSR Miles	General Description
Buffalo, Arkansas	USFS	2½	Arkansas Outstanding Resource Water	11.9	16.3	*"Where high quality water constitute an **outstanding state or national resource**, such as those waters designated as extraordinary resource waters, ecologically sensitive, or natural and scenic waterways, those uses and water quality for which the outstanding waterbody was designated shall be protected by (1) water quality controls, (2) maintenance of natural flow regime, (3) protection of instream habitat, and (4) encouragement of land management practices protective of the watershed."* (Arkansas Pollution Control and Ecology Commission 2011)
Cache La Poudre, Colorado	NPS, USFS	2½	Colorado Outstanding Water	34.7	83.3	*"The highest level of water quality protection applies to certain waters that constitute an outstanding state or national resource. These waters are called '**outstanding waters**'." (Colorado Water Quality Control Division 2001)*
Carp, Michigan	USFS	2½	Michigan Outstanding State Resource Water	13	30.7	*"For designated **Outstanding State Resource Waters** (OSRW) in the State of Michigan, controls shall be applied on pollutant sources to the OSRW or tributaries so that the water quality is not lowered in the OSRW." (Michigan Department of Environmental Quality 2006)*
Chattooga, Georgia, North Carolina, South Carolina*	USFS	2½	North Carolina Outstanding Resource Water	9.8	57.2	*"**Outstanding Resource Waters** (ORW) are a special subset of High Quality Waters with unique and special characteristics as described in Rule .0225 of this Section. The water quality of waters classified as ORW shall be maintained such that existing uses, including the outstanding resource values of said Outstanding Resource Waters, shall be maintained and protected." (North Carolina Environmental Management Commission n.d.)*
		2½	South Carolina Outstanding Resource Water	39.7		*"**Outstanding Resource Waters** (ORW) are freshwaters or saltwaters which constitute an outstanding recreational or ecological resource or those freshwaters suitable as a source for drinking water supply purposes with treatment levels specified by the Department." (South Carolina Department of Health and Environment 2017)*

River[41]	Agency	Tier	State Designation	WSR Miles Designated	Total WSR Miles	General Description
Clarks Fork, Wyoming	USFS	2½	Wyoming Class 1 Waters	22.3	23.5	*"**Class 1 waters** are specially designated waters on which the existing water quality is protected regardless of the uses supported by the water." (Wyoming Department of Environmental Quality 2013)*
Cossatot, Arkansas	State of Arkansas, USFS	2½	Arkansas Outstanding Resource Water	26.2	26.2	*"Where high quality water constitute an **outstanding state or national resource**, such as those waters designated as extraordinary resource waters, ecologically sensitive, or natural and scenic waterways, those uses and water quality for which the outstanding waterbody was designated shall be protected by (1) water quality controls, (2) maintenance of natural flow regime, (3) protection of instream habitat, and (4) encouragement of land management practices protective of the watershed." (Arkansas Pollution Control and Ecology Commission 2011)*
Delaware (Lower), Pennsylvania, New Jersey*	NPS Partnership	2½	Pennsylvania Exceptional Value Water	6.5	69.8	*"The water quality of **Exceptional Value Waters** shall be maintained and protected."* (Pennsylvania Department of Environmental Protection n.d.)
		2½	Pennsylvania High Quality Water	3.7		*"The water quality of **High Quality Waters** shall be maintained and protected, except as provided in § 93.4c(b)(1)(iii) (relating to implementation of antidegradation requirements)."* (Pennsylvania Department of Environmental Protection n.d.)
		2½	Delaware River Basin Commission Outstanding Basin Water	69.8		*"It is the policy of the Commission that there be no measurable change in existing water quality except towards natural conditions in waters considered by the Commission to have exceptionally high scenic, recreational, ecological, and/or water supply values. Waters with exceptional values may be classified by the Commission as either **Outstanding Basin Waters** or Significant Resource Waters."* (Delaware River Basin Commission 2013)

River[41]	Agency	Tier	State Designation	WSR Miles Designated	Total WSR Miles	General Description
Delaware (Middle), Pennsylvania, New Jersey*	NPS	2½	Delaware River Basin Commission Outstanding Basin Water	41.7	41.7	*"It is the policy of the Commission that there be no measurable change in existing water quality except towards natural conditions in waters considered by the Commission to have exceptionally high scenic, recreational, ecological, and/or water supply values. Waters with exceptional values may be classified by the Commission as either* ***Outstanding Basin Waters*** *or Significant Resource Waters."* (Delaware River Basin Commission 2013)
Delaware (Upper), Pennsylvania, New Jersey*	NPS	2½	Delaware River Basin Commission Outstanding Basin Water	73.8	73.8	*"It is the policy of the Commission that there be no measurable change in existing water quality except towards natural conditions in waters considered by the Commission to have exceptionally high scenic, recreational, ecological, and/or water supply values. Waters with exceptional values may be classified by the Commission as either* ***Outstanding Basin Waters*** *or Significant Resource Waters."* (Delaware River Basin Commission 2013)
East Branch Tahquamenon, Michigan*	USFS	2½	Michigan Outstanding State Resource Water	2.7	14.9	*"For designated* ***Outstanding State Resource Waters*** *(OSRW) in the State of Michigan, controls shall be applied on pollutant sources to the OSRW or tributaries so that the water quality is not lowered in the OSRW."* (Michigan Department of Environmental Quality 2006)
Eleven Point, Missouri*	USFS	3	Missouri Outstanding National Resource Water	45.3	45.3	*"[****Outstanding National Resource Waters****] shall receive special protection against any degradation in quality."* (Missouri Secretary of State 2014)
Fossil Creek, Arizona	USFS	3	Outstanding Arizona Water	17.4	17.4	*"Tier 3: Existing water quality shall be maintained and protected in a surface water that is classified as an* ***Outstanding Arizona Water*** *(OAW) under R18-11-112. Degradation of an OAW under subsection (C) is prohibited."* (Arizona Department of Environmental Quality 2009)

River[41]	Agency	Tier	State Designation	WSR Miles Designated	Total WSR Miles	General Description
Great Egg Harbor, New Jersey*	NPS Partnership	3	New Jersey Outstanding National Resource Water	68.7	147.4	*"'**Outstanding National Resource Waters**' or 'ONRW' means high quality waters that constitute an outstanding national resource (for example, waters of National/State Parks and Wildlife Refuges and waters of exceptional recreational or ecological significance). Waters classified as FW1 waters and Pinelands waters are Outstanding National Resource Waters."* (New Jersey Department of Environmental Protection 2011)
Horsepasture, North Carolina*	USFS	2½	North Carolina Outstanding Resource Water	4.5	4.5	*"**Outstanding Resource Waters** (ORW) are a special subset of High Quality Waters with unique and special characteristics as described in Rule .0225 of this Section. The water quality of waters classified as ORW shall be maintained such that existing uses, including the outstanding resource values of said Outstanding Resource Waters, shall be maintained and protected."* (North Carolina Environmental Management Commission n.d.)
Hurricane Creek, Arkansas	USFS	2½	Arkansas Outstanding Resource Water	16	16	*"Where high quality water constitute an **outstanding state or national resource**, such as those waters designated as extraordinary resource waters, ecologically sensitive, or natural and scenic waterways, those uses and water quality for which the outstanding waterbody was designated shall be protected by (1) water quality controls, (2) maintenance of natural flow regime, (3) protection of instream habitat, and (4) encouragement of land management practices protective of the watershed."* (Arkansas Pollution Control and Ecology Commission 2011)
Little Beaver Creek, Ohio*	State of Ohio	2½	Ohio Outstanding State Water	32.2	32.2	*"'**Outstanding state waters**' are waters that have special significance for the state because of their exceptional ecological values or exceptional recreational values, and that have been so categorized pursuant to paragraph (E) of this rule."* (Ohio Environmental Protection Agency 2017)

River[41]	Agency	Tier	State Designation	WSR Miles Designated	Total WSR Miles	General Description
Little Miami, Ohio*	State of Ohio	2½	Ohio Outstanding State Water	91.4	93	*"'**Outstanding state waters**' are waters that have special significance for the state because of their exceptional ecological values or exceptional recreational values, and that have been so categorized pursuant to paragraph (E) of this rule."* (Ohio Environmental Protection Agency 2017)
		2½	Ohio Superior High Quality Water	1.6		*"'**Superior high quality waters**' are surface waters that possess exceptional ecological values and that have been so categorized pursuant to paragraph (E) of this rule."* (Ohio Environmental Protection Agency 2017)
Little Missouri, Arkansas	USFS	2½	Arkansas Outstanding Resource Water	15.5	15.5	*"Where high quality water constitute an **outstanding state or national resource**, such as those waters designated as extraordinary resource waters, ecologically sensitive, or natural and scenic waterways, those uses and water quality for which the outstanding waterbody was designated shall be protected by (1) water quality controls, (2) maintenance of natural flow regime, (3) protection of instream habitat, and (4) encouragement of land management practices protective of the watershed."* (Arkansas Pollution Control and Ecology Commission 2011)
Loxahatchee, Florida*	State of Florida	2½	Outstanding Florida Water	7.4	7.4	*"It shall be the Department policy to afford the highest protection to **Outstanding Florida Waters** and Outstanding National Resource Waters. No degradation of water quality, other than that allowed in subsections 62-4.242(2) and (3), F.A.C., is to be permitted in Outstanding Florida Waters and Outstanding National Resource Waters, respectively, notwithstanding any other Department rules that allow water quality lowering."* (Florida Department of Environmental Protection n.d.)
Lumber, North Carolina*	State of North Carolina	2½	North Carolina High Quality Water	33	78.5	*"The Commission shall not allow degradation of the quality of **High Quality Waters** below the water quality necessary to maintain existing and anticipated uses of those waters."* (North Carolina Environmental Management Commission n.d.)

River[41]	Agency	Tier	State Designation	WSR Miles Designated	Total WSR Miles	General Description
Maurice, New Jersey*	NPS Partnership	3	New Jersey Outstanding National Resource Water	2.5	47.6	*"'**Outstanding National Resource Waters**' or 'ONRW' means high quality waters that constitute an outstanding national resource (for example, waters of National/State Parks and Wildlife Refuges and waters of exceptional recreational or ecological significance). Waters classified as FW1 waters and Pinelands waters are Outstanding National Resource Waters."* (New Jersey Department of Environmental Protection 2011)
Missouri, Nebraska, South Dakota*	NPS	2½	Nebraska State Resource Water- Class A	116.9	122.3	*"The existing quality of these **State Resource Waters** shall be maintained and protected."* (Nebraska Department of Environmental Quality 2014)
Mulberry, Arkansas*	USFS	2½	Arkansas Outstanding Resource Water	57.3	57.3	*"Where high quality water constitute an **outstanding state or national resource**, such as those waters designated as extraordinary resource waters, ecologically sensitive, or natural and scenic waterways, those uses and water quality for which the outstanding waterbody was designated shall be protected by (1) water quality controls, (2) maintenance of natural flow regime, (3) protection of instream habitat, and (4) encouragement of land management practices protective of the watershed."* (Arkansas Pollution Control and Ecology Commission 2011)
Musconetcong, New Jersey*	NPS Partnership	2½	Delaware River Basin Commission Outstanding Basin Water	24.9	24.9	*"It is the policy of the Commission that there be no measurable change in existing water quality except towards natural conditions in waters considered by the Commission to have exceptionally high scenic, recreational, ecological, and/or water supply values. Waters with exceptional values may be classified by the Commission as either **Outstanding Basin Waters** or Significant Resource Waters."* (Delaware River Basin Commission 2013)

River[41]	Agency	Tier	State Designation	WSR Miles Designated	Total WSR Miles	General Description
New, North Carolina*	State of North Carolina	2½	North Carolina Outstanding Resource Water	26.7	26.7	*"**Outstanding Resource Waters** (ORW) are a special subset of High Quality Waters with unique and special characteristics as described in Rule .0225 of this Section. The water quality of waters classified as ORW shall be maintained such that existing uses, including the outstanding resource values of said Outstanding Resource Waters, shall be maintained and protected."* (North Carolina Environmental Management Commission n.d.)
Niobrara, Nebraska*	NPS	2½	Nebraska State Resource Water- Class A	69.4	75.3	*"The existing quality of these **State Resource Waters** shall be maintained and protected."* (Nebraska Department of Environmental Quality 2014)
North Fork Smith, Oregon	USFS	2½	Oregon Outstanding Resource Water	13.5	13.5	*"Where existing high quality waters constitute an outstanding State or national resource such as those waters designated as extraordinary resource waters, or as critical habitat areas, the existing water quality and water quality values must be maintained and protected, and classified as '**Outstanding Resource Waters of Oregon**.'"* (State of Oregon Department of Environmental Quality 2017)
North Sylamore Creek, Arkansas	USFS	2½	Arkansas Outstanding Resource Water	13.7	13.7	*"Where high quality water constitute an **outstanding state or national resource**, such as those waters designated as extraordinary resource waters, ecologically sensitive, or natural and scenic waterways, those uses and water quality for which the outstanding waterbody was designated shall be protected by (1) water quality controls, (2) maintenance of natural flow regime, (3) protection of instream habitat, and (4) encouragement of land management practices protective of the watershed."* (Arkansas Pollution Control and Ecology Commission 2011)

River[41]	Agency	Tier	State Designation	WSR Miles Designated	Total WSR Miles	General Description
Obed, Tennessee*	NPS	3	Tennessee Outstanding National Resource Water	24.9	45.7	*"In surface waters designated by the Water Quality Control Board as **Outstanding National Resource Waters** (ONRWs), no new discharges, expansions of existing discharges, or mixing zones will be permitted unless such activity will not result in measurable degradation of the water quality."* (Tennessee Department of Environment and Conservation 2007)
		2½	Exceptional Tennessee Waters	20.8		*"In waters identified as **Exceptional Tennessee Waters** no degradation will be allowed unless and until it is affirmatively demonstrated to the Department, after full satisfaction of the following intergovernmental and public participation provisions, that a change is justified as a result of necessary economic or social development and will not interfere with or become injurious to any classified uses existing in such waters."* (Tennessee Department of Environment and Conservation 2007)
Ontonagon, Michigan*	USFS	2½	Michigan Outstanding State Resource Water	92.9	171.3	*"For designated **Outstanding State Resource Waters** (OSRW) in the State of Michigan, controls shall be applied on pollutant sources to the OSRW or tributaries so that the water quality is not lowered in the OSRW."* (Michigan Department of Environmental Quality 2006)
Pecos, New Mexico	USFS	3	New Mexico Outstanding National Resource Water	14.1	21.4	*"**Outstanding National Resource Waters** (ONRWs) are provided the highest level of protection under the antidegradation policy. The policy provides for protection of water quality in high-quality waters that constitute an ONRW by prohibiting the lowering of water quality."* (New Mexico Water Quality Control Commission 2010)

River[41]	Agency	Tier	State Designation	WSR Miles Designated	Total WSR Miles	General Description
Red, Kentucky*	USFS	3	Kentucky Outstanding National Resource Water	19.3	19.3	*"Water quality shall be maintained and protected in an **outstanding national resource water**."* (Kentucky Department of Environmental Protection 2013)
Richland Creek, Arkansas	USFS	2½	Arkansas Outstanding Resource Water	18.2	18.2	*"Where high quality water constitute an **outstanding state or national resource**, such as those waters designated as extraordinary resource waters, ecologically sensitive, or natural and scenic waterways, those uses and water quality for which the outstanding waterbody was designated shall be protected by (1) water quality controls, (2) maintenance of natural flow regime, (3) protection of instream habitat, and (4) encouragement of land management practices protective of the watershed."* (Arkansas Pollution Control and Ecology Commission 2011)
Rio Chama, New Mexico	USFS, BLM	3	New Mexico Outstanding National Resource Water	13.5	25	*"**Outstanding National Resource Waters** (ONRWs) are provided the highest level of protection under the antidegradation policy. The policy provides for protection of water quality in high-quality waters that constitute an ONRW by prohibiting the lowering of water quality."* (New Mexico Water Quality Control Commission 2010)
Saline Bayou, Louisiana*	USFS	2½	Louisiana Outstanding Natural Resource Water	24.3	24.3	*"**Outstanding Natural Resource Waters**—water bodies designated for preservation, protection, reclamation, or enhancement of wilderness, aesthetic qualities, and ecological regimes, such as those designated under the Louisiana Natural and Scenic Rivers System or those designated by the department as waters of ecological significance."* (Louisiana Department of Environmental Quality 2015)

River[41]	Agency	Tier	State Designation	WSR Miles Designated	Total WSR Miles	General Description
Sipsey Fork of the West Fork, Alabama	USFS	3	Alabama Outstanding National Resource Water	65.8	65.8	*"Where high quality waters constitute an **outstanding National resource**, such as waters of national and state parks and wildlife refuges and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected."* (Alabama Department of Environmental Quality 2017)
Snake River Headwaters, Wyoming	USFS, NPS	2½	Wyoming Class 1 Waters	257.8	407.6	*"**Class 1 waters** are specially designated waters on which the existing water quality is protected regardless of the uses supported by the water."* (Wyoming Department of Environmental Quality 2013)

River	Agency	Tier	Designation	Designated Miles	Total WSR Miles	General Description
St. Croix, Wisconsin, Minnesota*	States of Wisconsin and Minnesota, NPS	2½	Wisconsin Exceptional Resource Water	54.5	256.1	*"Surface waters which provide valuable fisheries, hydrologically or geologically unique features, outstanding recreational opportunities, unique environmental settings, and which are not significantly impacted by human activities may be classified as **exceptional resource waters**."* (Wisconsin Department of Natural Resources n.d.)
		2½	Wisconsin Outstanding Resource Water	201.6		*"No waters of the state shall be lowered in quality unless it has been affirmatively demonstrated to the department that such a change is justified as a result of necessary economic and social development, provided that no new or increased effluent interferes with or becomes injurious to any assigned uses made of or presently possible in such waters."* (Wisconsin Department of Natural Resources n.d.)
		2½	Minnesota Outstanding Resource Value Water	129		*"The [Minnesota Pollution Control] Agency recognizes that the maintenance of existing high quality in some waters of outstanding resource value to the state is essential to their function as exceptional recreational, cultural, aesthetic, or scientific resources. To preserve the value of these special waters, the agency will prohibit or stringently control new or expanded discharges from either point or nonpoint sources to **outstanding resource value waters**."* (Office of the Revisor of Statutes, State of Minnesota 2013)
Sturgeon (Ottawa National Forest), Michigan	USFS	2½	Michigan Outstanding State Resource Water	19.9	27.9	*"For designated **Outstanding State Resource Waters** (OSRW) in the State of Michigan, controls shall be applied on pollutant sources to the OSRW or tributaries so that the water quality is not lowered in the OSRW."* (Michigan Department of Environmental Quality 2006)

River	Agency	Tier	Designation	Designated Miles	Total WSR Miles	General Description
Virgin, Utah*	NPS, BLM	2½	Utah Category 1 Waters	84.3	171.9	*"Waters which have been determined by the Board to be of exceptional recreational or ecological significance or have been determined to be a State or National resource requiring protection, shall be maintained at existing high quality through designation, by the Board after public hearing, as **Category 1 Waters**. New point source discharges of wastewater, treated or otherwise, are prohibited in such segments after the effective date of designation."* (Utah Office of Administrative Rules 2017)
Wekiva, Florida*	NPS Partnership	2½	Outstanding Florida Water	44.4	44.4	*"It shall be the Department policy to afford the highest protection to **Outstanding Florida Waters** and Outstanding National Resource Waters. No degradation of water quality, other than that allowed in subsections 62-4.242(2) and (3), F.A.C., is to be permitted in Outstanding Florida Waters and Outstanding National Resource Waters, respectively, notwithstanding any other Department rules that allow water quality lowering."* (Florida Department of Environmental Protection n.d.)
Westfield, Massachusetts*	State of Massachu-setts	2½	Mass-achusetts Outstanding Resource Water	14.3	85.8	*"Certain waters are designated for protection under this provision in 314 CMR 4.06. These waters include Class A Public Water Supplies (314 CMR 4.06(1)(d)1.) and their tributaries, certain wetlands as specified in 314 CMR 4.06(2) and other waters as determined by the Department based on their outstanding socio-economic, recreational, ecological and/or aesthetic values. The quality of [**Outstanding Resource Waters**] shall be protected and maintained."* (Massachusetts Division of Water Pollution Control 2013)

River	Agency	Tier	Designation	Designated Miles	Total WSR Miles	General Description
White Clay, Delaware, Pennsylvania*	NPS Partnership	2½	Delaware Water of Exceptional Recreational or Ecological Significance	21.2	162.2	*"Designated **Exceptional Recreational or Ecological Significance (ERES) waters** shall be accorded a level of protection and monitoring in excess of that provided most other waters of the State. These waters are recognized as special natural assets of the State, and must be protected and enhanced for the benefit of present and future generations of Delawareans."* (Delaware Department of Natural Resources and Environmental Control 2014)
Wildcat, New Hampshire*	USFS	2½	New Hampshire Outstanding Resource Water	9.5	15.5	*"Where high quality surface waters constitute an **outstanding resource waters** (ORW), that water quality shall be maintained and protected."* (New Hampshire Department of Environmental Services n.d.)
Wilson Creek, North Carolina*	USFS	2½	North Carolina Outstanding Resource Water	23.5	23.5	*"**Outstanding Resource Waters** (ORW) are a special subset of High Quality Waters with unique and special characteristics as described in Rule .0225 of this Section. The water quality of waters classified as ORW shall be maintained such that existing uses, including the outstanding resource values of said Outstanding Resource Waters, shall be maintained and protected."* (North Carolina Environmental Management Commission n.d.)
Yellow Dog, Michigan*	USFS	2½	Michigan Outstanding State Resource Water	4.1	4.1	*"For designated **Outstanding State Resource Waters** (OSRW) in the State of Michigan, controls shall be applied on pollutant sources to the OSRW or tributaries so that the water quality is not lowered in the OSRW."* (Michigan Department of Environmental Quality 2006)

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