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# KEEPING OUR NATION'S PUBLIC DRINKING WATER SOURCES SAFE:

Why Americans' Drinking Water Sources are at Risk



An aerial photograph of a wetland or tidal flat. The image shows a complex, organic pattern of dark brown, almost black, mud channels and pools. These channels are filled with water, which is covered in a dense layer of small, white, frothy bubbles. The overall effect is a textured, lace-like appearance. The lighting is somewhat dim, highlighting the intricate details of the water's surface and the surrounding mud.

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### INTRODUCTION

We all need safe and healthy drinking water. And the best way to protect our drinking water is to protect its sources — surface water and groundwater supplies — from pollution. For the last 35 years, since enactment of the Clean Water Act, America's waters have been protected and the quality and safety of our waters have improved. But now, developers, the oil industry and other polluters want to weaken these longstanding clean water protections, by limiting its scope and making it legal to pave over or discharge pollution into small headwater streams and so-called “isolated” waters,<sup>1</sup> which are important for drinking water sources. If these efforts succeed, they will introduce more pollution into sources of our drinking water, threaten public health and force communities to pay more to treat drinking water.

Protecting headwater streams and wetlands is critical to protecting drinking water quality. According to the Environmental Protection Agency (EPA), more than 90% of source water protection areas<sup>2</sup> (areas protected for surface water intakes used for drinking water) contain headwater or intermittent streams, streams that flow only part of the year.<sup>3</sup> Furthermore, the EPA estimates that more than 110 million people get their drinking water from public drinking water systems which use the intakes in these source water protection areas (as well as other sources).<sup>4</sup>

The states that have the highest percentage of their populations served by source water protection areas that receive water from streams potentially at risk: Utah, Colorado, Kentucky, Massachusetts, Maryland, Oklahoma, Connecticut, Pennsylvania, Alabama and New York.

If these important waters are no longer protected under the Clean Water Act, then filling and discharging waste into these waters would be



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unregulated under the law. And if the federal government fails to protect them there are few states that can fill the void — primarily because industry has fought efforts to adopt state-level legislation or regulatory changes. Even where state-level protections exist, they are less effective without the underlying support of the Clean Water Act.

Absent protection of headwater streams, the quality of drinking water sources will be at risk. The federal government's failure to protect our sources of drinking water imposes an unfair burden on municipal water treatment providers, who will be forced to treat dirtier water to provide the public with safe and affordable drinking water.

Communities large and small rely upon the Clean Water Act to protect their drinking water sources. The five case studies highlighted in this report — four of which are based primarily on internal comments made by the EPA regional offices — illustrate how the enforcement of clean water protections in headwater streams and isolated waters is critical to safeguarding downstream tap water quality.

## Policy Directive Issued by the U.S. Environmental Protection Agency and the U.S. Army Corps of Engineers

Historically, federal agencies, in their regulations, have interpreted the protections of the Clean Water Act to broadly cover waters of the United States, including many small streams and wetlands. Since 2001, court rulings and administrative actions have sought to limit protections for small streams and wetlands under the Clean Water Act. Federal agencies, Congress, and the Supreme Court have all weighed in on this issue. Most recently, the Supreme Court issued a confusing and fractured opinion that leaves small streams and wetlands vulnerable to pollution and destruction. And a 2003 policy directive issued by the U.S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (Corps) has left many of our nation's waters at risk.

On January 15, 2003, the EPA and the Corps announced a new policy to remove Clean Water Act protections for many streams, wetlands, ponds, lakes and other waters. The policy — initiated through a joint memorandum issued by the EPA and the Corps<sup>5</sup> — effectively directed federal regulators to withhold protection from tens of millions of acres of wetlands, streams, and other waters unless they first get permission from their national headquarters in Washington, DC, on the pretext that they are “isolated.” There are very few waters that are truly isolated.

Most have surface water connections for most or part of the year, or subsurface connections. Excluding these waters from the Clean Water Act means that pollution will be allowed without limits and this pollution will eventually end up in downstream or connected waters.

The result of this policy directive has been that many waters have been swept into this “isolated waters” category and left with no federal protections. In August 2004, the Sierra Club, Earthjustice, the Natural Resources Defense Council (NRDC) and the National Wildlife Federation (NWF) issued *Reckless Abandon*, a report which documented fifteen examples of waters where the Corps declined to enforce federal restrictions against water pollution. The examples included a 150-mile-long river in New Mexico, thousands of acres of wetlands in one of Florida's most important watersheds, headwater streams in Appalachia, playa lakes in the Southwest, and a sixty-nine-mile-long canal used as a drinking water supply in California.

Clearly, the policy directive has put our important water resources at risk. Countless acres of wetlands, small streams and other waters that provide critical values are being opened up to destruction and degradation without any federal environmental review or limitations. Based on the recent Supreme Court decisions, we expect any future guidance from the agencies to exclude more of our nation's waters from the Clean Water Act and a loss of protections that help keep our sources of drinking water safe.

### So-Called “Isolated” Waters Important for Public Water Supplies

Some of the waters that are at risk of losing protections under the Clean Water Act because of this policy directive include wetlands, headwater streams, bogs, arroyos, prairie potholes, desert springs, forested vernal pools and playas. Many of these waters are the sources for much of our nation's drinking water or replenish those drinking water sources.



This report identifies examples of waters which could be affected by this proposed change in the scope of the Clean Water Act. Some of the waters at risk of losing protections have surface water intakes for drinking water located a mere 500 feet away. In other instances, some of the waters that could be written off as isolated are important for recharging groundwater resources used as public drinking water sources for millions of people. If these waters no longer receive Clean Water Act protections, then drinking water sources may be polluted.

### Policy Directive Puts Public Drinking Water Supplies at Risk

In 2006, the EPA conducted a preliminary estimate of public drinking water system intakes that get water from surface water protection areas in headwater streams and/or seasonal or intermittent streams. According to the EPA,

*In total, over 90% of surface water protection areas contain start reaches or intermittent/ephemeral streams. Public drinking water systems which use these intakes (as well as other sources)*

*are estimated to provide drinking water to over 110 million people.<sup>6</sup>*

If the policy directive continues, these waters may no longer receive federal Clean Water Act protections. These waters feeding these surface drinking water intakes could be polluted with no limits on pollution discharges. And the people who rely on these waters will either pay the price with dirtier water or higher costs of drinking water.

In 2006, EPA released data that includes the percentage of streams that are either start reaches<sup>7</sup> and/or intermittent and ephemeral streams in each state, as well as the population in each state served by source water protection areas that receive water from start reaches or intermittent/ephemeral streams. In terms of the percentage of population served by these at-risk waters, the top ten states are Utah (90%), Colorado (83%), Kentucky (77%), Massachusetts (75%), Maryland (70%), Oklahoma (70%), Connecticut (65%), Pennsylvania (65%), Alabama (58%) and New York (54%). For a complete list of this data for all states, please see Appendix A.

**TABLE 1: Ten States with the Highest Percentage of Population whose Sources of Drinking Water are at Risk from EPA/Corps Policy Directive**

State	% Streams Potentially at Risk from Policy Directive	Population Served by Source Water Protection Areas Receiving Water from Streams Potentially at Risk from Policy Directive	% of State's Population Served by Source Water Protection Areas Receiving Water from Streams Potentially at Risk from Policy Directive
Utah	79	2,003,441	90
Colorado	68	3,583,330	83
Kentucky	55	3,097,903	77
Massachusetts	52	4,733,465	75
Maryland	59	3,690,933	70
Oklahoma	74	2,420,695	70
Connecticut	52	2,223,112	65
Pennsylvania	59	7,979,560	65
Alabama	61	2,581,768	58
New York	55	10,220,056	54

# Case Studies of Drinking Water Sources at Risk from Policy Directive

The following examples — including California’s Santa Ana River, the watersheds providing drinking water to New York City, Pinal Creek watershed in Arizona, southwestern New Mexico and the Folsom South Canal in California — show how the policy directive could threaten drinking water sources.



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## Santa Ana River, California

Lying to the south and east of Los Angeles, the Santa Ana River is ultimately the primary drinking water source for Orange County residents, since it recharges the Orange County groundwater basin.<sup>8</sup>

The watershed, covering most of Orange County, the northwestern corner of Riverside County, the southwestern corner of San Bernardino County and a small portion of Los Angeles County is home to one of the fastest growing populations in California.

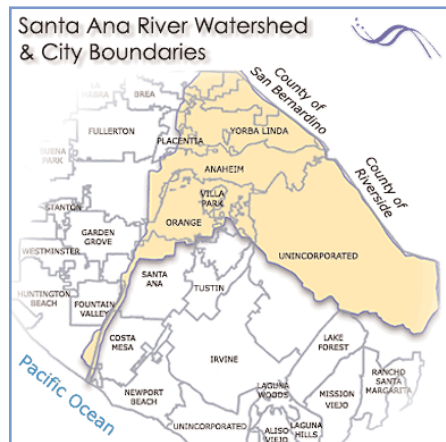
The watershed’s population is expected to grow to about seven million by 2025 and almost ten million by 2050. With this projected population growth, protecting the principal local source of drinking water is critical. The region cannot rely on imported water in the future.

As elsewhere in the western United States, much of the Santa Ana watershed is arid and has little natural year-round surface water flow. In fact 89% of the watershed’s stream miles flow only seasonally and after rainstorms.<sup>9</sup>

The upper reaches of the watershed are fed by stormwater, flow from the San Timoteo Creek and groundwater that reaches the surface. The Santa Ana River then flows year-round as it makes its way from the City of San Bernardino to the City of Riverside, with flows including treated discharges from wastewater treatment facilities. After passing the City of Riverside, the river is made up of highly treated wastewater discharges, urban runoff, irrigation runoff and groundwater that comes to the surface in some

sections. In the lower reaches of the watershed, the river travels in concrete-lined channels.

The Santa Ana River watershed has some 40 groundwater basins in it, many of which are interconnected. The Orange County groundwater basin, recharged primarily by the Santa Ana River, provides more than two million Orange County residents with approximately two-thirds of their water supply.



www.ocwatersheds.com

The Clean Water Act limits pollution discharged into streams that flow seasonally and after rainstorms. Based on this authority, the Santa Ana Regional Water Quality Control Board is responsible for issuing permits to eleven major wastewater dischargers in the watershed, and nearly all of them are upstream from major drinking water recharge basins.<sup>10</sup> The EPA

noted, for example, there was at least one enforcement order issued to a dairy operation discharging into an intermittent stream.<sup>11</sup> However, if this stream were considered “isolated” and lost Clean Water Act protections, the dairy could discharge waste into this stream with no limits. Furthermore, if a significant proportion of the watershed’s streams which do not flow year-round were to be re-defined and excluded from Clean Water Act protections, and the population in the watershed continues to grow at the current rate, the EPA predicts deteriorated drinking water quality; increased cost to drinking water utilities; poorer beach water quality; and more flooding during rainstorms.<sup>12</sup>

## New York City, New York

The Croton and the Catskill/Delaware water systems, made up of a network of reservoirs, lakes and wetlands, provide all of New York City's drinking water supply. Within this water supply network, there are an estimated 3,723 acres of vegetated wetlands and ponds with no obvious perennial surface connection to other waters within the New York City Water Supply watershed.<sup>13</sup> These could be labeled as "isolated" and lose Clean Water Act protections.

According to the New York City Department of Environmental Protection (NYCDEP), the loss of protections for these sites under the Clean Water Act would significantly affect the New York City water supply. These wetlands play a vital role in capturing and detaining rain and surface runoff and removing nutrients and pollutants from rain, runoff and groundwater — thereby improving downstream water quality. Most of the "isolated" and intermittent wetlands at risk because of the policy directive are located in the headwaters of the New York City watershed.

New York State regulates freshwater wetlands of 12.4 acres or greater in size. Because of this, NYCDEP has relied on the Clean Water Act to protect wetlands smaller than this. NYCDEP estimates that New York State Law would leave 77.7% of the "isolated" wetlands in the New York City watershed unprotected.<sup>14</sup>

Currently, NYCDEP directly protects only 172 acres (4.6%) of the "isolated" wetlands in the New York City watershed through its current land acquisition and voluntary programs.<sup>15</sup> Another 470 acres (12.6%) of "isolated" wetlands are on other city- and state-owned lands.<sup>16</sup> This means that NYCDEP relies on the federal Clean Water Act and its regulatory programs to protect the remaining 3,081 acres (82.8%) of "isolated" wetlands in the New York City watershed.<sup>17</sup>

Although legislation has been introduced in New York to broaden the protection for smaller wetlands under state law, in most states, state-level measures are seen as an important complement to, not an adequate substitute for, the comprehensive protections under the Clean



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Water Act. According to the Association of State Wetland Managers,

*Two-thirds of the United States currently lack regulatory programs that comprehensively address wetlands and isolated wetlands in particular. Of the states that do have regulatory programs, statutes and regulations addressing wetlands and other isolated waters vary substantially.*<sup>18</sup>

The NYCDEP opposes any exclusion of "isolated" waters from the Clean Water Act, arguing that "the extremely high quality of the City's water supply derives primarily from the natural protection and treatment provided by the watershed itself, including the extensive wetlands in the watershed, many of which do not have obvious surface water connections to other water bodies."<sup>19</sup> If these important waters were no longer covered under the Clean Water Act, the City's ability to provide a clean, safe drinking water supply might be hampered. This could mean more pollution in the water supply and higher costs for ratepayers to receive clean drinking water.

## Pinal Creek Watershed, Arizona



USGS

The Pinal Creek watershed is important for recharging the drinking water supply for Phoenix. However, under the current policy streams within the watershed that do not have natural year-round surface water flow could be excluded from the Clean Water Act. This would leave the streams and the watershed that ultimately supplies Phoenix with drinking water open to unregulated pollution.

The Pinal Creek watershed covers a broad region in the central Arizona's Gila County about 62 miles east of Phoenix. Approximately 10,000 residents live in the Pinal Creek communities of Globe, Miami, Claypool and Wheatfields and they rely on groundwater as their primary source of drinking water.<sup>20</sup> Pinal Creek flows through a narrow rock-walled canyon to the Salt River and eventually to Roosevelt Lake, which is an important water-supply reservoir for the City of Phoenix.<sup>21</sup>

Because of the arid climate, there is little natural year-round surface water flow. Most of the streams in the watershed flow only following rainstorms. In some areas of the watershed, streams help replenish groundwater supplies as the groundwater and the streams are closely connected.<sup>22</sup>

Open-pit copper mining in the watershed has left a legacy of tailing piles, smelters, leach dumps, waste rock dumps, and tailings piles, and contamination of streams and groundwater is well-documented.<sup>23</sup> In 1998, twenty-two stream miles of the watershed were listed as impaired for copper, manganese, acidity and zinc under the Clean Water Act's program for cleaning up polluted waters.<sup>24</sup> These pollutants can alter the makeup of fish and other aquatic organisms that live in the waters. In addition, locally heavy rainstorms can quickly flush contaminants into streams and, when this happens, discharges of acid, metals and other pollutants could harm downstream drinking water sources.

If the streams in Pinal Creek watershed that do not flow year-round are excluded from Clean Water Act protections, then the EPA and the State of Arizona would no longer be able to control pollution from mining activities in the region. State law prohibits the State of Arizona from implementing any regulations stronger than the federal regulations. This means that the state is unable to step in and fill any gaps in its clean water protections if the federal Clean Water Act no longer protects these "isolated" waters. According to the EPA, "The impacts to local and downstream drinking water sources could be significant."<sup>25</sup>



USGS

## Closed Basins in New Mexico



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Closed basins are important sources of drinking water for many communities in the West, and New Mexico in particular — where four defined groups of closed basins make up twenty percent of the total land area in the state.<sup>26</sup> The term “closed basin” generally describes any enclosed topographic basin or depression that has no external drainage. Because closed basins are typically not connected to interstate, navigable waters, they could be considered “isolated,” and left with no protections under the current policy.

For example, the Southwestern Closed Basin, a 5,990 square-mile basin, covers 5% of the total land area in New Mexico and includes Silver City and Deming.<sup>27</sup> The basin includes four water aquifers and serves 55,724 people.<sup>28</sup> The Mimbres aquifer is the largest of the underground water basins, covering 4,410 square miles.

The aquifers provide drinking water for communities like Silver City, located in Grant County, a largely rural area with a total population of 29,443.<sup>29</sup> According to Silver City’s Utility Department, the

sole source of Silver City’s water is groundwater pumped from twelve wells, eight of which draw water from the Mimbres aquifer.<sup>30</sup>

Under the policy directive, the Mimbres Water Basin as part of the Southwestern Closed Basin could lose its Clean Water Act protections. This would put the drinking water supply of Silver City’s 10,054 residents at risk,<sup>31</sup> as well as that of other towns in New Mexico that rely on groundwater for their drinking water supply.

The EPA identified potential contamination of groundwater as one effect of removing protections from isolated and intermittent waters, like closed basins. Further, the EPA recognizes that groundwater “is a significant source of drinking water for at least two States” in the Region, which includes New Mexico.<sup>32</sup>

There is a clear need to protect groundwater sources to ensure that drinking water sources and public health are protected for future generations. Right now, the policy directive is putting that objective at risk.

## Folsom South Canal, California

The sixty-nine mile<sup>33</sup> Folsom South Canal is a man-made structure that conveys water diverted from Lake Natoma on the American River in California to provide drinking water to the city of Rancho Cordova.

Despite its use as drinking water, the Corps determined that the Folsom South Canal was not a water of the United States and did not merit protections under the Clean Water Act. According to a Corps' letter to the county's Board of Environmental Review approving a proposal to widen a highway that crossed the canal, portions of the Folsom South Canal could be filled without any Clean Water Act protections because it does not connect with other waters of the United States.

According to the county consultants and the Corps, the canal has no surface outlet. For this reason, the Corps ruled that the canal's waters are not protected under the Clean Water Act. The consultants' report states that:

*The Folsom South Canal was not considered a Waters of the United States (sic) because the hydrology of the canal is artificially maintained, it does not connect Waters of the U.S., and it does not bisect other Waters of the U.S.<sup>34</sup>*

The Corps's decision to deny Clean Water Act protections to an entire canal completely ignores the fact that it is used as a source of drinking water. If the Corps were to apply this same logic to other areas, many more sources of our nation's drinking water could be opened up to pollution and destruction.



Jan Fleckenstein

# Conclusion & Recommendations

The EPA/Corps policy directive has left many important drinking water sources without Clean Water Act protections. While the EPA and the Corps have pushed to only narrowly apply Clean Water Act protections to select waters, some federal courts have ruled that the scope of the Clean Water Act needs to be maintained, but recent Supreme Court rulings have created ambiguity and doubt. And the U.S. Department of Justice has consistently and successfully argued in federal court that the agencies' existing definition of waters of the United States is valid and, indeed, required to achieve the purposes of the Clean Water Act. In the midst of the uncertainty created by the agencies and the courts, there is a clear need for Congress to act and clarify the intent of the Clean Water Act.

The policy directive has been a green light for federal regulators to allow dredging, filling and

polluting of waters that clearly fall under the Clean Water Act's jurisdiction. If the waters identified in this report are classified as "isolated" under the EPA/Corps policy directive, the communities that depend on those waters for drinking water will either have dirtier drinking water or have to pay for a more expensive, higher level of treatment for their tap water. There is a clear need to protect these drinking water sources, and the federal government should enforce the Clean Water Act as Congress intended.

We cannot afford to sacrifice any more of our nation's invaluable water resources. Congress needs to pass the Clean Water Authority Restoration Act to reaffirm the Act's original intent to protect broadly waters of the United States, so that we may restore the biological, chemical and physical integrity of our nation's waters and protect the drinking water of communities across America.



Washington Trout

# Endnotes:

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- 1 There are in fact, no truly “isolated” waters. Waters are generally connected to other waters by surface flow and/or groundwater connections of some form. The term “isolated” has been used by the U.S. Environmental Protection Agency and Army Corps of Engineers to describe some wetlands and small streams for which Clean Water Act protections are being denied.
- 2 Source Water Protection Areas, in this instance, encompass the drainage area of up to 15 miles upstream from a drinking water intake.
- 3 Letter from Ben Grumbles, Assistant Administrator of Water for EPA to Jeanne Christie, Executive Director of the Association of State Wetland Managers, dated January 9, 2005. [sic]
- 4 Id.
- 5 68 Fed. Reg. 1991, January 15, 2003.
- 6 Letter from Ben Grumbles, Assistant Administrator for Water, Environmental Protection Agency to Ms. Jeanne Christie, Executive Director, Association of State Wetland Managers. January 9, 2005.[sic]
- 7 Start reaches are stream segments that located at the head of a tributary system and have no other streams flowing into them.
- 8 EPA Region 9 Comments on ANPRM for Jurisdictional Waters. Submitted by Wayne Natri, Regional Administrator to G. Tracy Mehan, III, Assistant Administrator for Water. December 2, 2003.
- 9 Id.
- 10 Id.
- 11 Id.
- 12 Id.
- 13 EPA Region 2 Comments to ANPRM regarding SWANCC and Clean Water Act Jurisdiction. Submitted by Walter Mugdan, Division of Environmental Planning and Protection to Diane Regas, Office of Wetlands, Oceans, and Watersheds. April 16, 2003.
- 14 Id.
- 15 Id.
- 16 Id.
- 17 Id.
- 18 Association of State Wetland Managers, State Wetland Programs at <http://aswm.org/swp/index.htm>. For information about individual state wetlands programs go to <http://aswm.org/swp/statemainpage9.htm>.
- 19 New York City Comments in Response to the United States Environmental Protection Agency’s (EPA) and the United States United States Department of Defense Army Corps of Engineers’ (Army Corps) request for public comments on an Advanced Notice of Proposed Rulemaking on the Clean Water Act. Submitted to Water Docket ID No. OW-2002-0050 by Christopher O. Ward, Commissioner. April 16, 2003.
- 20 EPA Region 9 Comments on ANPRM for Jurisdictional Waters. Submitted by Wayne Natri, Regional Administrator to G. Tracy Mehan, III, Assistant Administrator for Water. December 2, 2003.
- 21 USGS at <http://az.water.usgs.gov/pinal/hydrogeo.html>
- 22 EPA Region 9 Comments on ANPRM for Jurisdictional Waters. Submitted by Wayne Natri, Regional Administrator to G. Tracy Mehan, III, Assistant Administrator for Water. December 2, 2003.
- 23 Id.
- 24 Id.
- 25 Id.
- 26 EPA Region 6 Response to the Advanced Notice of Proposed Rule-making on Clean Water Act Jurisdiction. Submitted by Miguel Flores, Division Director to G. Tracy Mehan III, Assistant Administrator for Water.
- 27 Id.
- 28 Id.
- 29 <http://www.silvercity.org/population.shtml>
- 30 Silver City’s Utilities Department 2005 Annual Water Quality Report at <http://www.townofsilvercity.org/utilities/wqr2005.htm>.
- 31 <http://www.silvercity.org/population.shtml>.
- 32 EPA Region 6 Response to the Advanced Notice of Proposed Rule-making on Clean Water Act Jurisdiction. Submitted by Miguel Flores, Division Director to G. Tracy Mehan III, Assistant Administrator for Water.
- 33 [www.recreation.gov](http://www.recreation.gov)
- 34 Area West Environmental, Wetland Delineation for the Hazel Avenue Widening Project, March 2003, p.11. The canal does go under (through culverts) and over (through raised structures) streams in the area, but apparently does not connect with these waters.

# APPENDIX A

## State-by-State Breakdown of Populations Served by Source Water Protection Areas Receiving Water from Streams Potentially at Risk from EPA/Corps Policy Directive

State	% Streams Potentially at Risk from EPA's Policy Directive <sup>1,2</sup>	Population Served by Source Water Protection Areas Receiving Water from Streams Potentially at Risk from EPA Policy Directive <sup>3,*</sup>	% of State's Population Served by Source Water Protection Areas Receiving Water from Streams Potentially at Risk from EPA Policy Directive
AL	61	2,581,768	58
AR	63	911,466	34
AZ	94	818,881	16
CA	66	14,272,000	42
CO	68	3,583,330	83
CT	52	2,223,112	65
FL	29	916,454	6
GA	57	3,810,208	47
HI	55	40,084	3
IA	62	620,639	21
ID	51	242,589	19
IL	56	1,623,780	13
IN	54	1,668,898	27
KS	81	1,372,206	51
KY	55	3,097,903	77
LA	38	1,071,156	24
MA	52	4,733,465	75
MD	59	3,690,933	70
ME	55	389,174	31
MI	48	298,007	3
MN	51	959,301	20
MO	66	2,549,622	46
MS	58	289,740	10
MT	63	341,821	38
NC	56	4,297,102	53
ND	84	290,800	45
NE	77	525,566	31
NH	55	474,976	38
NJ	48	2,882,025	34
NM	88	211,146	12
NY	55	10,220,056	54
OH	60	3,471,892	31
OK	74	2,420,695	70
OR	53	1,581,537	46
PA	59	7,979,560	65
RI	54	551,162	53
SC	53	1,470,158	37
SD	86	341,211	45
TN	60	2,963,333	52
TX	75	7,284,836	35
UT	79	2,003,441	90
VA	57	3,317,038	47
VT	56	253,213	42
WA	54	1,701,824	29
WI	53	199,457	4
WV	60	881,596	49
WY	66	177,861	36
National	59	111,604,794	37

1 EPA citation for Data Source: National Hydrography Dataset (NHD) from Reach Address Database (RAD) v2.0 at 1:100,000 scale. Percentages are calculated relative to total stream length using total kilometers of linear streams in watersheds that are totally or partially contained within each state boundary. Watersheds are at the 8-digit Hydrologic Unit Code (HUC) level.

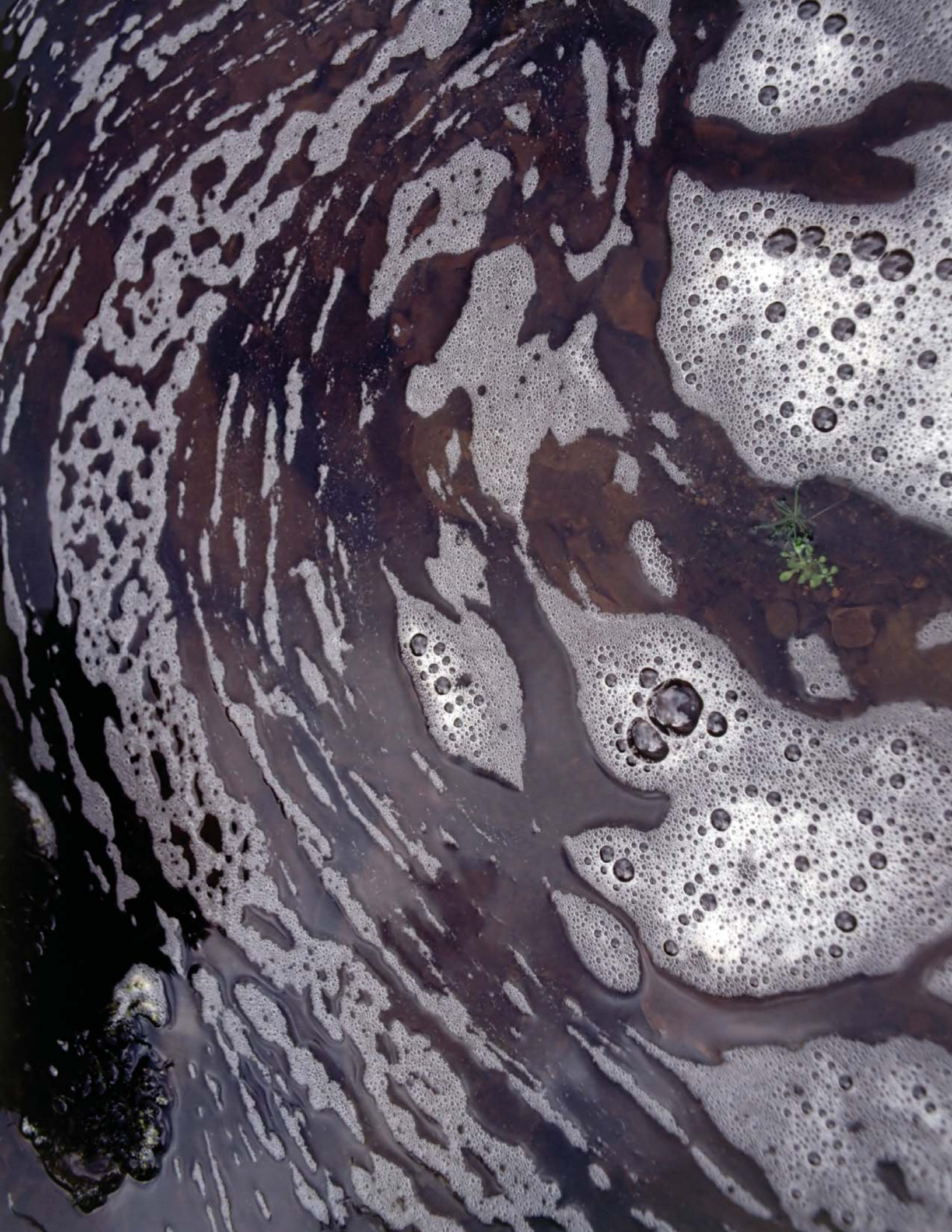
2 Streams potentially at risk from the EPA's policy directive include start reaches and intermittent/ephemeral streams. The EPA data included the percentage of streams in each state that are start reaches and the percentage of streams that are intermittent/ephemeral streams. We used the higher of those two numbers to illustrate the percentage of streams potentially at risk because of the EPA's policy directive.

3 EPA citation for Data Sources: NHD (1:100,000 scale), Safe Drinking Water Information System (SDWIS); Preliminary Analysis. Source water protection areas (SWPAs) (based on SDWIS 4th Quarter 2003 data) for this estimate encompass the drainage area of up to 15 miles upstream from a drinking water intake, and any SWPA that contains at least one start reach or intermittent/ephemeral stream is included in the count. Only SWPAs of intakes located on the NHD are included in this analysis (EPA has located over 85% of intakes on the NHD).

\* Does not include data on tribal lands

EPA GENERAL CAVEATS: NHD data generally do not capture streams under one mile in length. Intermittent and ephemeral streams are grouped together in the NHD. Washes in the arid western U.S. are not consistently demarcated. A start reach is a stream segment in the NHD that has no other streams flowing into it.







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