EPA and USGS Response to Public Comments on the "Draft EPA/USGS Technical Report: Protecting Aquatic Life from Effects of Hydrologic Alteration"

December 1, 2016

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EPA and USGS Response to Public Comments on the "Draft EPA/USGS Technical Report: Protecting Aquatic Life from Effects of Hydrologic Alteration"

EPA and USGS provided an extended opportunity for the public to provide comments on the document "Draft EPA/USGS Technical Report: Protecting Aquatic Life from Effects of Hydrologic Alteration". EPA published the draft document on 3/1/16 with an original comment period end date of 5/3/16. The public comment period was extended to 6/17/16. EPA and USGS received approximately 150 public comments. EPA and USGS carefully considered the submitted comments and made revisions to the final document in response to those comments. This response document is organized in the following manner: Public comments were arranged into major categories; this was done to facilitate considering and responding to public comments overall. For each comment category a summary of the public comments is provided, followed by EPA and USGS responses to major subthemes for each category of comment. For the full individual public comments, the reader is directed to the public docket. As appropriate, the EPA and USGS responses provided below reference the relevant locations in the "Draft EPA/USGS Technical Report: Protecting Aquatic Life from Effects of Hydrologic Alteration" where public comments have been addressed.

Comment Category 1 – Comments Supporting the Document

Overview of Public Comments on this topic

Many commenters supported the document noting that it was scientifically sound, reflective of current literature and provided relevant technical information. Examples include noting that the document fills a need for states, territories and watershed stakeholders working toward protection of aquatic life uses. Commenters appreciated that the document addressed the full suite of important components of the natural flow regime rather than merely addressing minimum flows; emphasized public Involvement in development of flow targets; and provided readers the background and resources necessary to help guide water resource management decisions.

Response to Comment Category 1

The EPA and USGS note that the primary focus of this paper was to ensure that accurate and up-to-date technical information was provided on this topic and appreciate the technical review provided by the commenters. The EPA and USGS note that, in addition to the comments supporting the technical paper, several of the comments included recommendations to update the technical information in the document or to correct technical omissions. The comments were reviewed and, where appropriate, the technical paper was updated (Comment Category

9). A list of the technical reference papers that were added to the document is included in Comment Category 8.

Comment Category 2 – Comments on the Case Law Appendix, Water Quality Standards and Policy Portions of the Document

Overview of Public Comments on this topic

Many commenters provided comments on the case law appendix, and the document's water quality standards and policy discussions. On the case law appendix, several commenters provided examples of case law that had not been included and that the commenters thought should be included to present a fuller picture of the case law on hydrologic alteration. Several commenters stated that the case law discussion should not be included in the document. Commenters questioned whether the intent of the document was truly to be a technical document or instead a justification for expansion of Federal authority.

Response to Comment Category 2

After careful consideration of public comments and the information provided in the report, EPA and USGS decided to remove the case law and the water quality standards appendices from the document so that the focus of the document is clearly on the technical information presented on potential impacts of hydrologic alteration and approaches that could be considered in developing quantitative flow targets, if desired. While agreeing to remove these sections from the document in response to public comments about the technical nature of the report, EPA and USGS do not think the discussion of case law presented in the draft document was inaccurate.

Comment Category 3 – Comments on Federal authority, state's rights and state's water rights

Overview of Public Comments on this topic

Several commenters expressed the concern that the draft document reflected an overreach of Federal authority and undermined state's rights, including state's water rights. Some commenters said that the case law appendix, water quality standards appendix, and policy discussion throughout the document illustrated their point. Some individuals, states, and organizations identified examples of language in the document that they thought demonstrated overreach of Federal authority.

Response to Comment Category 3

After careful consideration of the public comments, EPA and USGS decided to remove the case law appendix, water quality standards appendix, and policy discussions from the document to ensure that the focus of the document is on the technical information presented about

potential impacts of hydrologic alteration and approaches that could be considered in developing quantitative flow targets, if desired. Sections 304(a)(2) and 304(f) of the CWA provide EPA with the authority to provide such technical information. CWA Section 304(a)(2) generally requires EPA to develop and publish information on the factors necessary to restore and maintain the chemical, physical, and biological integrity of navigable waters. Section 304(a)(2) also allows EPA to provide information on the factors necessary for the protection and propagation of shellfish, fish, and wildlife in receiving waters and for allowing recreational activities in and on the water. CWA Section 304(f) requires EPA to issue information to control pollution resulting from, among other things, "changes in the movement, flow, or circulation of any navigable waters."

Comment Category 4 – Comments on the Document's Relationship to the Clean Water Rule

Overview of Public Comments on this topic

Several commenters expressed concerns that the flow document was an extension of the Clean Water Rule. Specifically, they mentioned the case law appendix, water quality standards appendix, and the document's policy discussions.

Response to Comment Category 4

After careful consideration of the public comments, EPA and USGS decided to remove the case law appendix, water quality standards appendix, and policy discussions from the document to ensure that the focus of the document is on the technical information presented on potential impacts of hydrologic alteration and approaches that could be considered in developing quantitative flow targets, if desired. The EPA and USGS note that this technical document does not discuss, and has no bearing on, whether a particular water is a Water of the United States. Nor is the Clean Water Rule referenced in the document.

Comment Category 5 – Comments on the Tone of the document

Overview of Public Comments on this topic

Several commenters questioned the overall tone of the document. They felt the document has a negative tone. They listed several examples, including the discussions about dams, irrigation and agriculture.

Response to Comment Category 5

After careful consideration of public comments, EPA and USGS reviewed and edited the document to ensure that the focus of the document is on technical information about potential impacts of hydrologic alteration and approaches that could be considered in developing quantitative flow targets, if desired. EPA and USGS have made every effort to ensure that the document has an objective and neutral tone throughout.

Comment Category 6 – Comments on the Scope of the Document

Overview of Public Comments on this topic
Several commenters said the document should expand its scope and include additional content. For example, some commenters requested that the document be expanded to mention additional designated uses such as drinking water, recreational uses, and others and should be expanded beyond flowing waters (rivers and streams) to include estuaries, lakes, and reservoirs. Some commenters suggested the document should discuss and include additional models, such as PHABSIM or IFIM, and discuss other tools such as the Nature Conservancy's tool IHA (Indicators of Hydrologic Alteration). Some commenters requested more guidance on maintaining pre-development runoff conditions, a permitting process for wetlands, maintenance of existing stream hydrography, lost hydrology and ecological functions. There were also several comments requesting inclusion of more case studies and examples.

Response to Comment Category 6
At the outset, EPA and USGS determined that the appropriate scope of this technical document was aquatic life designated uses in flowing waters, and the purpose of the document was to provide technical background on the effects of altered flow on aquatic life, examples of states that have adopted narrative flow criteria for the protection of aquatic life, and a framework for development of flow targets to protect the aquatic life designated use, if so desired. EPA and USGS have reviewed the document in light of these comments and decided to maintain the document's original scope and purpose and determined that the current content is consistent with that scope and purpose.

Comment Category 7 – Comments regarding the positive aspects of hydrologic alteration.

Overview of Public Comments on this topic
Several commenters said that the document neglected to add information on the positive aspects of flow manipulation. Specifically, they said they wanted to see more content relating to the beneficial aspects of dams and water diversions.

Response to Comment Category 7
The focus of the document is the presentation of technical information on potential impacts of hydrologic alteration on aquatic life and approaches that could be considered in developing quantitative flow targets, if desired. It is not the purpose of the document nor within the scope of the document to discuss and evaluate the realized and perceived benefits of hydrologic alteration.

Comment Category 8 – Comments on additional references

Overview of Public Comments on this topic
Several commenters provided suggestions for additional references in the text.

Response to Comment Category 8
EPA and USGS reviewed the document to determine if the additional references would enhance the focus of the document as a presentation of technical information on potential impacts of hydrologic alteration and approaches that could be considered in developing quantitative flow targets, if desired. Below is a list of additional references added to the document:

Adler, Robert, 2003, The two lost books in the water quality trilogy—the elusive objectives of physical and biological integrity: Environmental Law, v. 33, p. 29–77. [Also available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1683724.]

Barlow, P.M., and Leake, S.A., 2012, Streamflow depletion by wells—Understanding and managing the effects of groundwater pumping on streamflow: U.S. Geological Survey Circular 1376, 84 p. [Also available at http://pubs.usgs.gov/circ/1376/.]

Davis, J. M., Baxter, C. V., Rosi-Marshall, E. J., Pierce, J. L., & Crosby, B. T., 2013, Anticipating Stream Ecosystem Responses to Climate Change: Toward Predictions that Incorporate Effects Via Land–Water Linkages. Ecosystems, v. 16, no. 5, p. 909–922. [Also available at http://doi.org/10.1007/s10021-013-9653-4.]

DePhilip, Michele, and Moberg, Tara, 2013, Ecosystem flow recommendations for the Delaware River Basin: Harrisburg, PA, The Nature Conservancy, 97 p. [Also available at http://www.state.nj.us/drbc/library/documents/TNC_DRBFlowRpt_dec2013.pdf.]

Diebel, M.W., M. Fedora, S. Cogswell, and J.R. O'Hanley. 2015. Effects of road crossings and habitat connectivity for stream-resident fish. River Research and Applications. 10:1251-1261.

Hoffman, R.L., Dunham, J.B., and Hansen, B.P., eds., 2012, Aquatic organism passage at road-stream crossings—Synthesis and guidelines for effectiveness monitoring: U.S. Geological Survey Open-File Report 2012-1090, 64 p. [Also available at https://pubs.usgs.gov/of/2012/1090/pdf/ofr20121090.pdf]

Huang, Jian, and Frimpong, E.A., 2016, Modifying the United States national hydrography dataset to improve data quality for ecological models: Ecological Informatics, v. 32, p. 7–11. [Also available at http://dx.doi.org/10.1016/j.ecoinf.2015.12.005.]

Kennedy, T.A., Muehlbauer, J.D., Yackulic C.B., Lytle, D.A., Miller, S.W., Dibble, K.L., Kortenhoeven, E.W., Metcalfe, A.N., and Colden, V.B., 2016, Flow Management for Hydropower Extirpates Aquatic Insects, Undermining River Food Webs: Bioscience v. 66, no. 7, 561-575 [Also available at http://dx.doi.org/10.1093/biosci/biw059]

Knight, R.R., Gain, W.S. and Wolfe, W.J., 2012. Modelling ecological flow regime: an example from the Tennessee and Cumberland River basins: Ecohydrology, v. 5, no. 5, p. 613–627. [Also available at http://dx.doi.org/10.1002/eco.246.]

Knight, R.R., Murphy, J.C., Wolfe, W.J., Saylor, C.F. and Wales, A.K., 2014. Ecological limit functions relating fish community response to hydrologic departures of the ecological flow regime in the Tennessee River basin, United States: Ecohydrology, v. 7, no. 5, p.1262–1280. [Also available at http://dx.doi.org/10.1002/eco.1460.]

Kornis, M.S., Weidel, B.C., Powers, S.M., Keiebel, M.W., Cline, T.J., Fox, J.M., and Kitchell, J.F., 2015, Fish community dynamics following dam removal in a fragmented agricultural stream: Aquatic Science, v. 77, p. 465–480. [Also available at http://dx.doi:10.1007/s0027-014-0391-2.]

Mathews, Ruth, and Richter, B.D., 2007, Application of the indicators of hydrologic alteration software in environmental flow setting: Journal of the American Water Resources Association, v. 43, no. 6, p. 1400 –1413. [Also available at http://dx.doi.org/10.1111/j.1752-1688.2007.00099.x.]

Maupin, M.A., Kenny, J.F., Hutson, S.S., Lovelace, J.K., Barber, N.L., and Linsey, K.S., 2014, Estimated use of water in the United States in 2010: U.S. Geological Survey Circular 1405, 56 p. [Also available at http://pubs.usgs.gov/circ/1405/.]

Olden, J.D., Poff, N.L., and Bestgen, K.R., 2006, Life-history strategies predict fish invasions and Extirpations in the Colorado River basin: Ecological Monographs, v. 76, no.1, p. 25–40. [Also available at http://dx.doi.org/10.1890/05-0330.]

Olivero, A.P., and Anderson, M.G., 2008, Northeast aquatic habitat classification system: Boston, MA, The Nature Conservancy, Eastern Regional Office, 88 p. [Also available at http://rcngrants.org/content/northeastern-aquatic-habitat-classification-project.]

Pahl-Wostl, Claudia, Arthington, A.H., Bogardi, J.J., Bunn, S.E., Holger, Hoff, Lebel, Louis, Nikitina, Elena, Palmer, M.A., Poff, N.L., Richards, K.S., Schlüter, Maja, Schulz, Roland, St-Hilaire, Andre, Tharme, R.E., Tockner, Klement, and Tsegai, D.W., 2013, Environmental flows and water governance—managing sustainable water use: Current Opinion in Environmental Sustainability, v. 5, no. 3–4, p. 341–351. [Also available at http://dx.doi.org/10.1016/j.cosust.2013.06.009.]

Pess, G., Quinn, T., Gephard, S., and Saunders, R., 2014, Recolonization of Atlantic and Pacific rivers by anadromous fishes: linkages between life history and the benefits of barrier removal: Reviews in Fish Biology and Fisheries, v. 24, p. 881–900. [Also available at http://dx.doi.org/10.1007/s11160-013-9339-1.]

Poff, N.L., and Hart, D.D., 2002, How dams vary and why it matters for the emerging science of dam removal: BioScience, v. 52, p. 659–668. [Also available at http://dx.doi.org/10.1641/0006-3568(2002)052[0659:HDVAWI]2.0.CO;2.]

Poff, N. L., and Schmidt, J. C., 2016, How dams can go with the flow. Science, v. 353, no. 6304, p. 1099–1100. [Also available at http://dx.doi.org/10.1126/science.aah4926.]

Poff, N.L., Olden, J.D., and Strayer, D.L., 2012, Climate change and freshwater fauna extinction risk, chap. 17 *of* Hannah, Lee, ed., 2012, Saving a million species—Extinction risk from climate change: Washington, Island Press, p. 309–336. [Also available at http://dx.doi.org/10.5822/978-1-61091-182-5_17.]

Southeast Aquatic Resources Partnership—Flow-ecology literature compilation: accessed August 4, 2016, at http://southeastaquatics.net/sarps-programs/sifn/instream-flow-resources/flow-ecology-literature-compilation.

Taylor, J.M, Fisher, W.L., Apse, Colin, Klein, David, Schuler, George, and Adams, Stevie, 2013, Flow recommendations for the tributaries of the Great Lakes in New York and Pennsylvania: Rochester, NY, The Nature Conservancy, 101 p. plus appendixes. [Also available at http://rcngrants.org/sites/default/files/final_reports/RCN%202010-2%20final%20report.pdf.]

The Nature Conservancy, 2015, ELOHA bibliography: accessed August 4, 2016, at http://www.conservationgateway.org/ConservationPractices/Freshwater/EnvironmentalFlows/MethodsandTools/ELOHA/Pages/ELOHA_Bibliography.aspx.

Tuckerman, S., and Zawiski, B., 2007, Case Studies of Dam Removal and TMDLs: Process and Results: Journal of Great Lakes Research, v. 33(Special Issue 2), p. 103–116. [Also available at http://dx.doi.org/10.3394/0380-1330(2007)33[103:CSODRA]2.0.CO;2.]

U.S. Environmental Protection Agency, 2016, Information Concerning 2016 Clean Water Act Section 303(d), 305(b), and 314 Integrated Reporting and Listing Decisions: U.S. Environmental Protection Agency, Office of Water, Office of Wetlands, Oceans, and Watersheds, p. 14-16 [Also available at https://www.epa.gov/sites/production/files/2015-10/documents/2016-ir-memo-and-cover-memo-8_13_2015.pdf.]

Vaughn, C.C., and Taylor, C.M., 1999, Impoundments and the Decline of Freshwater Mussels: a Case Study of an Extinction Gradient: Conservation Biology, v. 13, p. 912–920. [Also available at http://dx.doi.org/10.1046/j.1523-1739.1999.97343.x]

Wahl, K.L., and Tortorelli, R.L., 1997, Changes in flow in the Beaver-North Canadian River Basin upstream from Canton Lake, western Oklahoma: U.S. Geological Survey Water-Resources Investigations Report 96–4304, 56 p. [Also available at https://pubs.er.usgs.gov/publication/wri964304.]

Zhang, Z., Balay, J.W., Bertoldi, K.M., and MaCoy, P.O., 2015, Assessment of water capacity and availability from unregulated stream flows based on Ecological Limits of Hydrologic Alteration (ELOHA) environmental flow standards: River Research and Applications, v. 32, p. 1469–1480. [Also available at http://dx.doi.org/10.1002/rra.2979.]

Comment Category 9 – Comments on clarifications or corrections

Overview of Public Comments on this topic

Several commenters provided suggestions for clarifications or corrections in the text.

Response to Comment Category 9

EPA and USGS reviewed the document to determine if the requested clarifications or corrections would be consistent with the focus of the document on presenting technical information on potential impacts of hydrologic alteration and approaches that could be considered in developing quantitative flow targets, if desired. While there were many good suggestions for additional content, many of the comments were beyond the scope of this document. The following clarifications or corrections were added to the document.

Commenter	Comment	Response
EPA-HQ-OW-2015-0335-0011; Anonymous	"In Table 1 on page 44, the narrative flow standard for New York is shown as applying only to Class N waters. Please note that in addition to Class N waters (6NYCRR Part 701.2(d)), the New York narrative standard for flow also applies to Classes AA, A, B, C, D, and A-Special (6NYCRR Part 703.2) as well as Class AA-Special (6NYCRR Part 701.3(e)".	Table 1 has been corrected to reflect these edits.
EPA-HQ-OW-2015-0335-0016; Freshwater Mollusk Conservation Society	"The draft report on hydrologic alteration released by the EPA and USGS omits information on the impacts of hydrologic alteration on freshwater mollusks".	The document was edited to include specific reference of impacts to mollusks on pages 38 and 59.
EPA-HQ-OW-2015-0335-0041; American Rivers EPA-HQ-OW-2015-0335-0063; National Wildlife Federation	Commenters noted that the ecological benefits of dam removal were omitted from the document.	Section 4.3.1 amended to include ecological benefits of obsolete dam removal.
EPA-HQ-OW-2015-0335-0061; Arizona Game and Fish Commission EPA-HQ-OW-2015-0335-0150; American Fisheries Society	Commenters noted that the footnote on page 74 did not accurately describe the database assembled by the National Fish Habitat Partnership.	The footnote was edited.

Commenter	Comment	Response
EPA-HQ-OW-2015-0335-0088; Theodore Roosevelt Conservation Partnership. EPA-HQ-OW-2015-0335-0150; American Fisheries Society	Commenters noted that the report should include Oregon's example of narrative flow criteria in Table 1. "Table 1: We suggest you add an example from western states, such as Oregon and Texas, because western USA water law differs markedly from eastern water law. Also order the examples alphabetically or indicate the rationale for the current ordering in the Table title. Section 5.1: Another good place to add an example from a western state, such as Oregon, because western USA water law differs markedly from eastern water law, and the west is a much drier region than the east".	The Oregon example was not included, as Table 1 is not an inclusive list of all states with narrative criteria or other provisions addressing flow, but rather examples of states and Tribes with narrative criteria.
EPA-HQ-OW-2015-0335-0122; Washington Department of Ecology	Noted that "some commentary on why these states have flow in the standards and not others would be of interest. East Coast states use riparian doctrine for water resources, which give them more control over flow. Western states use the system of prior appropriation water rights, which generally puts flow off the table. I'm surprised to not see Oregon listed. Please include them in the table, since they are the only western state. I'd like to know how they address flow".	The Oregon example was not included, as Table 1 is not an inclusive list of all states with narrative criteria or other provisions addressing flow, but rather examples of states and Tribes with narrative criteria.

Commenter	Comment	Response
EPA-HQ-OW-2015-0335-0122; Washington Department of Ecology	"Vegetation is a critical element of hydrology".	Language was added to section 4.2 to include vegetation.
EPA-HQ-OW-2015-0335-0122; Washington Department of Ecology	"Woody debris is an important component of natural systems".	Organic material was added to the conceptual model. Page 21
EPA-HQ-OW-2015-0335-0122; Washington Department of Ecology	"Streams below dams can be dewatered unless dams contain minimum flow levels".	Low flows were included as an impact in Section 4.3.1.
EPA-HQ-OW-2015-0335-0122; Washington Department of Ecology	"There are many uses of diverted water not included in the examples".	4.3.2 modified to clarify direct diversions and storage diversions and make it more general 4.3.2 interbasin transfer effect on donor and receiving stream clarified
EPA-HQ-OW-2015-0335-0122; Washington Department of Ecology	"There are many uses of groundwater not included in the examples".	Section 4.3.3 was clarified to make the uses of groundwater more general.
EPA-HQ-OW-2015-0335-0122; Washington Department of Ecology 0PA-HQ-OW-2015-0335)-0126 CASQAp	"There are more types of effluents and artificial discharges than mentioned". "In urban areas, inputs to creek baseflow also include leaking potable water systems, septic systems, and landscape irrigation, all of which may consist of water that has been imported from outside of the watershed".	In section 4.3.4, examples of effluents and artificial discharges were clarified.
EPA-HQ-OW-2015-0335-0122; Washington Department of Ecology	"Impervious surfaces can reduce base flows for months in the Pacific Northwest".	In section 4.3.5, "months" was added to better describe the timing of impacts
EPA-HQ-OW-2015-0335-0122; Washington Department of Ecology	"Generalize the discussion of mines. "highly localized" is not always true for large strip mines. Strip mines have a multitude of impacts on hydrology, including runoff from denuded areas,	In section 4.3.5, the mining discussion was generalized. Reclamation acknowledged.

Commenter	Comment	Response
	groundwater pumping (both lowering water tables and discharge of pumped water to a stream), on-site treatment of wastewater, impacts of roads and ditches, etc… Expand this discussion by differentiating between surface and underground mines, recognizing the diversity of impacts, and providing more examples of impacts." 4.3.5: "In the mining section, add material regarding the effects of deep mines and fracking on flow regimes. All mining can affect hydrologic regimes, including quality and quantity, with implications to finfish and shellfish. See Hughes et al. (2016) for synopses".	
Mining associations	Reclamation influences the hydrologic impacts of mining.	In section 4.3.5, the mining discussion was generalized. Reclamation acknowledged.
EPA-HQ-OW-2015-0335-0122; Washington Department of Ecology	"Natural areas is a poorly defined term".	Section 4.3.5 was generalized to other management activities, as they are not limited to natural areas and natural areas was poorly defined.
EPA-HQ-OW-2015-0335-0122; Washington Department of Ecology EPA-HQ-OW-2015-0335-0037; Trout Unlimited	You might also note that increased wildfires is predicted as a result of climate change, and that wildfires have severe effects on the hydrology of recently burned watersheds. "We recommend explicit inclusion of fire regimes in this section".	Altered fire regimes was added to section 4.3.6.

Commenter	Comment	Response
EPA-HQ-OW-2015-0335-0122; Washington Department of Ecology	"The geomorphology of stream channels and flood plains, absent direct human alteration, is shaped largely by natural the watershed hydrology and resulting flow patterns."	Section 4.4.1 was clarified to describe natural effects to geomorphology.
EPA-HQ-OW-2015-0335-0122; Washington Department of Ecology	"Irrigation return flows are not the best example - they can increase infiltration and may have little effect on runoff".	We concur and impervious surface was used as that example in section 4.4.2.
EPA-HQ-OW-2015-0335-0122; Washington Department of Ecology	"This section should discuss explicitly the need for a data quality assessment. Washington State, and I suspect other states, have "credible data" laws that require CWA assessments to use data of known and acceptable quality".	A discussion of data quality needs and "credible data" laws as they relate to flow is beyond the scope of the document. However, in section 6.5, a sentence was added to acknowledge that data quality concerns should be examined and considered in the process.
EPA-HQ-OW-2015-0335-0122; Washington Department of Ecology	"Why is a single indicator selected for Scenario A before modeling is done to quantify relationships?"	A clarifying sentence was added at the end of section 6.9 and some language in table 2 was modified to clarify that the table contains one example of many flow attribute and biological indicators are usually examined in the process.
EPA-HQ-OW-2015-0335-0122; Washington Department of Ecology	"It would be more appropriate to make a more general statement about analytical hydrology tools that can provide estimates of ungaged flows".	Section A.1 was generalized to say hydrologic analytical tools like Stream Stats
EPA-HQ-OW-2015-0335-0122; Washington Department of Ecology	"Do mining impacts fall under this section? If so, some discussion of mining and the case law related to	Mining language was included in section A.4. However, case law is not

Commenter	Comment	Response
	stream impacts would be useful."	appropriate for a technical document.
EPA-HQ-OW-2015-0335-0122; Washington Department of Ecology. EPA-HQ-OW-2015-0335-0087; Michigan Department of Natural Resources EPA-HQ-OW-2015-0335-0150; American Fisheries Society	"Road networks can disrupt hydrology by intercepting and channelizing flows." "Sources of flow alteration could be bolstered by adding information on drains and road stream crossings as sources of flow alteration."	Road crossings were included as an impact throughout paper, including under Section 4.3 and Section 4.4.2.
EPA-HQ-OW-2015-0335-0128; AWWA	"The title phrase of Box F on page 57 stating "South Carolina Board of Health and Environmental Control Denied Certification" is unnecessarily alarming and also misleading given the content of the example".	The title has been edited.
	Multiple commenters noted that the listing of states in Table 1 should be alphabetical.	Table 1 was re-organized to list the States and tribes in alphabetical order rather than in the order of EPA Regions.