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FIGHTING FOR NATURE'S RIGHTS

Comment # 2

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State Water Resources Control Board
P.O. Box 100, Sacramento, CA 95812-2000

VIA ELECTRONIC MAIL: WQAssessment@waterboards.ca.gov

Re: Comment Letter—303(d) List Portion of the 2014 and 2016 California Integrated Report

Dear Chair Marcus and Board Members:

2.01

On behalf of Earth Law Center (ELC), which works for waterways' rights to flow, we welcome the opportunity to submit this formal request for the inclusion of hydrologically-impaired (*i.e.*, flow-impaired) waterways in the 2014 and 2016 California Integrated Report. At minimum, ELC requests the following waterways be listed as hydrologically-impaired, whether under Category 4C or Category 5:

2014 Integrated Report Regions

- Central Coast Region (Region 3): Salinas River, Carmel River, San Clemente Creek, Big Sur River, and Santa Maria River
- Central Valley Region (Region 5): San Joaquin River, inflow to the Delta; and the San Francisco Bay-Delta, outflow to Suisun Bay and San Francisco Bay
- San Diego Region (Region 9): Those 30 waterways already properly identified as hydrologically-impaired in Region 9's approved Integrated Report

2016 Integrated Report Regions

- San Francisco Region (Region 2): Napa River (non-tidal)
- Los Angeles Region (Region 4): The Ventura River (Reaches 3 and 4) and the Santa Clara River
- Santa Ana Region (Region 8): Santa Ana River (Reaches 3 and 4)

ELC submitted comment letters to each of the above Regions requesting that these waterways be listed as hydrologically impaired in each region's respective Integrated Report. Additionally, after approval of the regional 2014 or 2016 Integrated Reports (with the exception being the Los Angeles Region, which has not approved its Integrated Report), ELC requested in a May 5, 2017 letter that the State Water Board review the above listings for hydrologically-impaired waterways that had not been made.

ELC reiterates its request that the State Water Board list hydrologically impaired waterways within the Integrated Report, whether Category 4C or 5 – and in particular those waterways that are impaired due to low flows. As described below, this request is supported by the Clean Water Act and the implementing guidance from the U.S. Environmental Protection Agency (U.S. EPA), and is supported by compelling public policy considerations and precedent in other states as well as the State Board's own documents as attached hereto (*see* Attachment C; available online at: http://bit.ly/2u0cQFG). Therefore, we ask that you revise the draft Staff Report to include, at minimum, the above-listed waterways as hydrologically-impaired under Categories 4C or 5.

2.02

1. Full Compliance with Clean Water Act Sections 305(b) and 303(d) Requires Identification of Hydrologically Impaired Waterways

Clean Water Act (CWA) Section 303(d)(1)(A) requires California to "identify those waters within its boundaries for which the effluent limitations … are not stringent enough to implement any water quality standard applicable to such waters." This must be a robust listing, with sufficient details about the waterways (including flow) to allow the state to "establish a priority ranking" for the waterways, also required by Section 303(d)(1)(A). In other words, California's 303(d) list must provide a comprehensive list of all impairments. The state's Listing Policy provides some mixed direction, stating on the one hand that the 303(d) list only covers impairments by "pollutants" (rather than also by "pollution," such as flow),[1] but on the other hand stating that Regional Water Board Fact Sheets supporting Section 303(d) listings "shall contain . . . Pollutant *or type of pollution* that appears to be responsible for standards exceedance."[2] The latter path is the appropriate course.

No objection, further, can be made to including flow-impaired waterways on the Section 303(d) list on the basis that the state is not required to prepare TMDLs to address "pollution." First, Section 303(d)(1)(A) makes no mention of limiting the 303(d) list to those waterways requiring Total Maximum Daily Loads (TMDLs). In fact, no mention of TMDLs is made until Section 303(d)(1)(C), which sets requirements on how to manage impaired waterways. Moreover, the state itself does not take this position for waterways impaired by pollutants. Instead, the state lists in Category 5 (what it deems its Section 303(d) list) pollutant-impaired waterways that do, and do not, require TMDLs by state evaluation.[3] Accordingly, the state must include hydrologically impaired waterways, including those impaired by altered flow, on its 303(d) list.

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[1] SWRCB, "Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List," p. 3; at: http://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2015/020315_8_amendment_clean_version.pdf (Listing Policy).

[2] *Id*. at p. 18 (emphasis added).

[3] Even the state does not take that position, choosing instead to include in the Section 303(d) list Category 5 waters that do, and do not, require TMDLs. Listing Policy, *supra*, at Section 2.2, p. 3; *see also* San Francisco Bay Regional Water Quality Control Board Clean Water Act Sections 305(b) and 303(d) 2016 Integrated Report for the San Francisco Bay Region: Staff Report (2017) ("staff report"), p. 6 (stating that "…waterbodies remain in Category 5 until all 303(d)-listed pollutants are addressed by USEPA-approved TMDLs *or by another regulatory program that is expected to result in the reasonable attainment of the water quality standards*….") (emphasis added).

2.03

The state must also include hydrologically impaired waters in its broader, CWA Section 305(b) report. Section 305(b) requires states to submit biennial[4] reports that "shall" describe the "water quality of all navigable waters," including an analysis of the extent to which the waters protect fish and wildlife, for compilation and submission to Congress.[5] Federal regulations describe this requirement and its purpose, stating that **the Section 305(b) report "serves as the primary assessment of State water quality" and the basis of states' water quality management plan elements, which "help direct all subsequent control activities."**[6] States must use the Section 305(b) report to develop their annual work program under Sections 106 and 205(j).[7] And must review the 305(b) report in developing the 303(d) list.[8] California's Integrated Report accordingly must include an adequate Section 305(b) report if the state is to develop meaningful 303(d) list and water quality plans that appropriately direct staff and resources to the most important control activities.

The Section 305(b) report must particularly include information regarding waterway flows to ensure that the fundamental purpose of Section 305(b) in guiding workplanning is met. The provision of information regarding waterway flow is also called for by CWA Section 101, which sets the **national objective of restoring and maintaining the** "**chemical, *physical*, and biological integrity of the Nation's waters**." (Emphasis added.) The U.S. Supreme Court itself explicitly affirmed the importance of addressing physical elements of waterway health such as flow, stating that **the distinction between water quality and quantity under the CWA is "artificial."**[9]

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[4] We note for the record that the state's Section 303(d) and 305(b) reports are extremely overdue. The 2014 regions (Central Coast, Central Valley, and San Diego Regions) are now almost three years overdue, while the 2016 regions (Los Angles, Santa Ana, and San Francisco Bay Regions) are now almost one year overdue, contrary to the clear language of the CWA (*see* 33 U.S.C. § 1313(d), 1315(b); 40 C.F.R. § 130.7(d)(1)). *We object strongly to this continued, illegal, statewide delay in compliance with CWA Sections 303(d) and 305(b).*

[5] 33 U.S. Code § 1315(b)(1); *see also* 40 CFR § 130.8. Section 305(b)(1) states that the biennial report "shall include":

"(A) a description of the water quality of all navigable waters in such State during the preceding year, with appropriate supplemental descriptions as shall be required to take into account seasonal, tidal, and other variations, correlated with the quality of water required….;

(B) an analysis of the extent to which all navigable waters of such State provide for the protection and propagation of a balanced population of shellfish, fish, and wildlife, and allow recreational activities in and on the water; …

(E) a description of the nature and extent of nonpoint sources of pollutants, and recommendations as to the programs which must be undertaken to control each category of such sources, including an estimate of the costs of implementing such programs." As to this last point, the SWRCB itself has recognized flow alterations as a form of nonpoint source pollution, reinforcing the need to properly account for it in the Section 305(b) report. *See, e.g.*, "Hydromodification, Wetlands and Riparian Areas Technical Advisory Committee: Recommendations to the SWRCB" (Dec. 6, 1994), at: http://www.waterboards.ca.gov/water_issues/programs/nps/tacrpts.shtml.

[6] 40 CFR § 130.8(a) (emphasis added).

[7] *Id.*

[8] 40 C.F.R. § 130.7(b)(5)(i) ("At a minimum 'all existing and readily available water quality-related data and information' includes but is not limited to all of the existing and readily available data and information about the following categories of waters: …Waters identified by the State in its most recent section 305(b) report as 'partially meeting' or 'not meeting' designated uses or as 'threatened'.).

[9] *PUD No. 1 of Jefferson County v. Washington Department of Ecology*, 511 U.S. 700 (1994).

2.04 By contrast with this direction, the draft Staff Report runs afoul of the CWA by ignoring Category 4C entirely for inclusion in either its 303(d) list or its 305(b) report, incredibly reporting that ***zero*** water bodies amongst the 2014 and 2016 regions are impaired due to altered hydrology, with only three water bodies listed under Category 4C at all.[10] The State Water Board appears to rely on the Listing Policy for this decision, which states that the 303(d) list only includes those water segments that require the development of a TMDL.[11] Here, again, the draft Staff Report assumes an illegally narrow definition of its requirements under the CWA. The Integrated Report is supposed to include *both* a robust and legally adequate 303(d) list *as well as* a robust and legally adequate 305(b) report. These requirements are combined; they are not the same (*see also* sec. 8). If the State Water Board takes the position that pollution-impaired waterways (including flow-impaired waters) cannot be included in the Section 303(d) list, then the Listing Policy – which by definition applies *only* to the Section 303(d) list – is irrelevant. It cannot be used as an excuse to ignore flow impairments entirely. In that case, the State Board must then turn to its requirements under Section 305(b), which broadly require it to report on water quality, including as impacted by altered flow.

2.05 Indeed, the draft Staff Report recognizes that it must consider flow-impaired waterways in its assessment, describing Category 4C as being applicable if "[t]he non-attainment of any applicable water quality standard for the waterbody segment is the result of pollution and is not caused by a pollutant."[12] No legitimate reason is given for entirely failing to comply with this requirement, however. A legally adequate Section 305(b) report must include waterways impaired by pollution, including hydrologically impaired waterways, whether or not the waterways are also impaired by a pollutant. This information is also critical for the state to set waterway protection priorities properly.

Proper identification of hydrologically impaired waterways is also important if the state is to fully comply not only with Section 305(b), but with CWA Section 303(d) as well. This section not only calls for identification of impaired and threatened waterways, but also requires the state to prepare a "*priority ranking*" of such waters, "taking into account the severity of the pollution" and waterway uses.[13] Flow and other hydrologic alteration data and information, which must be included in the 305(b) report and considered as part of the 303(d) list development, are critical to proper prioritization of impaired waters for further staff and resource attention.

2.06 Finally, we reiterate that because Section 303(d)(1)(A) broadly requires identification of impairments *regardless* of whether TMDLs are needed, the state's Section 303(d) list should include a robust Category 4C set of listings. State law cannot weaken the requirements of the CWA by artificially limiting the scope of this list.

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[10] Matilija Creek Reach 1, Matilija Creek Reach 2, and the Matilija Reservoir – all due to fish barriers. *See* Staff Report, Appendix D ("2014 California Water Impacted by Pollution, Category 4C").
[11] *See* Listing Policy, p. 3.
[12] *See* Draft Staff Report, p. v.
[13] 33 U.S. Code § 1313(d)(1)(A) (emphasis added).

2.07

2. U.S. EPA Guidance and Reports, and the State Water Board Itself, Have Called for Identification of Hydrologically Impaired Waterways in Category 4C of the Integrated Report

U.S. EPA issued formal Integrated Report Guidance (*i.e.,* for the combined Sections 303(d) and 305(b) reports) to states and territories in August 2015; in it, EPA specifically addresses the topic of hydrological impairment.[14] The U.S. EPA Guidance clearly states that

> If States have data and/or information that a water is impaired due to pollution not caused by a pollutant (e.g., aquatic life[15] use is not supported due to hydrologic alteration or habitat alteration), those causes should be identified and that water should be assigned to Category 4C.[16]

The Guidance specifically references hydrologic alteration as an example of a Category 4C listing.[17] It further references EPA Guidance going back at least to 2006, which similarly said that flow-impaired waters should be identified in the Integrated Report under Category 4C (the 2010 CCKA *et al.* Letter references this 2006 Guidance in support of flow listings; *see* attachment 4).

U.S. EPA and USGS reinforced this mandate in a joint report in February 2016 on flow, stating in part that "EPA recommends reporting impairments due to hydrologic alteration in Category 4c, which are those impairments due to pollution not requiring a TMDL."[18]

Even more specifically, U.S. EPA Region 9 has *directly* told the State Water Board that the Board is "well aware of [EPA's] interest toward listing selected streams for 'flow impairments' (at least under 305(b)) where lines of evidence are strong."[19]

Further, the State Water Board Executive Director himself decided that the state should identify flow-impaired waters in its Integrated Reports, stating that California "would now list for flow alterations" and that "[l]istings would be made under category 4C for impaired [sic] by pollution not a pollutant, and be based on staff's professional judgment as well as the evidence submitted by the data."[20] Again, no reason is given in the Staff Report for

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[14] 2015 EPA Listing Guidance, *supra*, pp. 13-16.
[15] Note here that U.S. EPA specifically calls out protection of aquatic life as a reason to identify flow-impaired waters. The Staff Report similarly calls out aquatic life for specific protection (p. ii), but then ignores the next step of identifying flow impairments that injure aquatic life.
[16] *Id.* at p. 15.
[17] *Id*.
[18] U.S. EPA and USGS, "Draft EPA-USGS Technical Report: Protecting Aquatic Life from Effects of Hydrologic Alteration," Chapter 5 (Feb. 2016); at: https://www.epa.gov/sites/production/files/2016-03/documents/aquatic-life-hydrologic-alteration-report.pdf (U.S. EPA/USGS Report).
[19] Email from Tim Vendlinski, U.S. EPA Region 9 to Diane Riddle, SWRCB (Jan. 7, 2015); available upon request.
[20] Email from Nicholas Martorano, SWRCB to SWRCB/RWQCB staff (July 22, 2013) (referencing decision by Thomas Howard, SWRCB); available upon request. Note that such Category 4C listings can and should be made for waterways that are also listed for other categories, including Category 5 (*see* Sec. 8).

ignoring the clear flow impairments throughout the region in light of the CWA, guidance, and state direction.

Nor is the State Board's conclusion that Category 4C and Category 5 listings are mutually exclusive legally justified.[21] The Clean Water Act makes clear and the EPA Guidance accordingly instructs that these categories overlap.[22] The State Board's interpretation is overly narrow and is entirely inconsistent with the EPA Guidance and the Clean Water Act.

2.08

3. The San Diego RWQCB Properly Adopted Numerous Listings for Hydrologic Impairment for Its Integrated Report, which the State Water Board Disregarded without Adequate Explanation

The San Diego Regional Water Quality Control Board (SD RWQCB) adopted an Integrated Report and Staff Report[23] that **identified 30 waterway segments for listing in Category 4C, either with a Category 5 pollutant listing or alone**.[24] Consistent with U.S. EPA Guidance, the SD RWQCB recognized that identifying *all* pollutant and pollution impairments provides a far more accurate picture of the challenges before the state than ignoring key impairments. For example, the Staff Report found that "over 96 percent of streams that exhibited biological degradation had both an associated pollutant(s) and supporting information showing pollution from in-stream habitat/hydrologic alteration and/or watershed hydrologic alteration (hydromodification, Table 3)." If the Regional Board had ignored such pollution impairments, then virtually all of the impaired streams in the San Diego Region would have been under-assessed, likely resulting in misallocation of limited resources and attention. ELC commented to the San Diego Board in support of these listings; these comments are attached.[25]

Rather than integrating San Diego's approved list of impaired water segments into the statewide 2014 and 2016 Integrated Report, the State Water Board failed to list *any* of the 30 water segments that had been listed under Category 4C. Inexplicably and illegally, State Water Board staff failed to even offer a rationale for this omission.[26] While State Water

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[21] Based on publicly available documents obtained by ELC via a Public Records Act request, correspondence from the State Board to EPA it is clear that the State Board is well aware that its refusal to list impairments based on both pollutants and pollution is contrary to EPA guidance. *See* Attachment C (email from Nicholas Martorano, SWRCB to SWRCB/EPA staff dated July 27, 2015 stating: "The 2016 guidance does state that an individual waterbody could be place into both Category 5 and 4c but that is no the way the State Water Board interprets the statute and definitions.").

[22] See 33 U.S.C. §§ 1313(d), 1315(b); see also 2015 EPA Listing Guidance, *supra*, p. 15.

[23] *See* Draft adopted Oct. 12, 2016 at: http://www.waterboards.ca.gov/sandiego/water_issues/programs/303d_list/.

[24] http://www.waterboards.ca.gov/sandiego/water_issues/programs/303d_list/docs/IR_RB_StaffReport_R9_07-11-16_Clean.pdf, Table 3.

[25] Also found at: http://bit.ly/SDRWQCB (note attachments to this letter as well for further supporting information).

[26] In developing the 303(d) list, the State Board is required to explain why existing, readily available data, including SD RWQCB's Category 4C listings, was not used. See 40 C.F.R. § 130.7(b)(6) ("Each State shall provide documentation to the Regional Administrator to support the State's determination to list or not to list its waters… and shall include at a minimum: …A description of the data and information used to identify

Board staff may have relied upon its belief that water segments can be placed into only "one of five non-overlapping categories based on the overall beneficial use support of the water segment,"[27] this justification is misguided, as described above and further in Section 8. And at minimum, State Water Board staff could have noted the Category 4C listings within the list of Category 5 waterways. This is the very approach that was taken for the Ventura River Reach 4, for which the Category 5 list notes that "pumping" and "water diversion" are in fact Category 4C listings (impairment due to pollution that do not require a TMDL).[28] However, as written, the public is left to guess whether those 30 waterways identified by the SD RWQCB are in fact impaired due to hydromodification according to the draft Staff Report – and if not, for what reason. The State Board's elimination of SD RQWCB's Category 4C listings is illegal, and cannot be justified even if the State Board offered an explanation—which it has not.

2.09

4. California Has Identified Hydrologically Impaired Waterways in the Past

In California, "Pumping" and "Water Diversion" have been listed as the *sole* causes of impairment for Ventura River Reach 4, in the Los Angeles Region. Also in the Los Angeles Region, Ventura River Reach 3 has been listed for "Pumping" and "Water Diversion," and Ballona Creek Wetlands has been listed as impaired by "Hydromodification," among other impairments. All three water body segments have been listed for these specific flow-related impairments in Category 5.[29] California's history of identifying flow-related impairments under Section 303(d) is consistent with the Clean Water Act, and should be considered precedential.

2.10

5. Numerous Other States Have Identified Hydrologically Impaired Waterways in Categories 4C and 5

Many states around the country have followed U.S. EPA Guidance and the CWA by properly identifying flow-impaired waterways in their Integrated Reports. These include, but are not limited to, Western states such as Idaho, Montana, Wyoming, Washington and New Mexico.[30] One listing methodology that may be of particular interest to the San Francisco Bay Region is that used by Ohio, which identifies waters impaired by flow alteration by linking biological community degradation with upstream dams. Notably, a number of these states regularly include flow-impaired waterways on their 303(d) list as well as their 305(b) Report. ELC has collected a significant amount of information on other states'

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waters, including a description of the data and information used by the State as required by § 130.7(b)(5).").
The State Board has failed to include any such explanation it the draft Integrated Report.

[27] Draft Staff Report, p. 18

[28] Appendix A: Category 5 List, 2014 California 303(d) List of Water Quality Limited Segments, at: http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2014_2016/category5_report.shtml. ELC notes that Santa Barbara Channelkeeper has submitted separate comments related to inconsistencies with the listings for Reaches 3 and 4 of the Ventura River. ELC fully supports Channelkeeper's comments, and incorporates them herein.

[29] http://www.swrcb.ca.gov/losangeles/water_issues/programs/303d/2008/Final%20303(d)/Appendix_E_08Aug09.pdf.

[30] *See* detailed memorandum on this topic prepared by ELC for the SWRCB at: http://bit.ly/303d305b.

hydrologic impairment listings and processes (and provided this to the State Water Board); this can be made readily available to the San Francisco Bay RWQCB if desired.

2.11

6. Flow Standards Are Not Required to Identify Hydrologically Impaired Waterways in Category 4C

Most, if not all, of the states that identify hydrologic (including flow) impairments make those listing decisions based on best professional judgment and the information before them. Flow standards are not required to be developed first. Even the State Water Board has stated that flow listings could be done "based on staff's professional judgment as well as the evidence submitted by the data," and that they "would likely be mostly narrative . . . unless there are specific numeric targets for flow in place."[31] In other words, the state itself has recognized that flow criteria are not necessary for flow impairment listings.[32] ELC has compiled significant information collected on various states' hydrologic impairment listing strategies, which are attached hereto (*see* Attachment D).

2.12

U.S. EPA addresses the process of identifying hydrologically impaired waters in its 2015 EPA Listing Guidance, stating that:

> if States have data and/or information that a water is impaired due to pollution not caused by a pollutant (e.g., aquatic life use is not supported due to hydrologic alteration or habitat alteration), those causes should be identified and that water should be assigned to Category 4C. Examples of hydrologic alteration include: a perennial water is dry; no longer has flow; has low flow; has stand-alone pools; has extreme high flows; or has other significant alteration of the frequency, magnitude, duration or rate-of-change of natural flows in a water; or a water is characterized by entrenchment, bank destabilization, or channelization. Where circumstances such as unnatural low flow, no flow or stand-alone pools prevent sampling, it may be appropriate to place that water in Category 4C for impairment due to pollution not caused by a pollutant. In order to simplify and clarify the identification of waters impaired by pollution not caused by a pollutant, States may create further sub-categories to distinguish such waters.[33]

Note that this description of the process for identifying flow impairments does *not* require adoption of flow standards as a prerequisite for listing.

2.13

The SD RWQCB Staff Report also addressed this topic in their Staff Report and Integrated Report, similarly stating that:

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[31] Email from Nicholas Martorano, SWRCB to SWRCB/RWQCB staff (July 22, 2013); *see* Attachment C.
[32] Instead, State Board staff seem to be avoiding Category 4C listings due to concerns not legally or factual relevant to the quality of California's waterways. See Attachment C (email from Nicholas Martorano, SWRCB to RWQCB/EPA staff (October 16, 2015)).
[33] 2015 EPA Listing Guidance, *supra*, p. 15.

> where a water segment exhibited significant degradation in biological populations and/or communities as compared to reference site(s) the San Diego Water Board assessed the segment for inclusion in Category 4c using data and information as prescribed in USEPA's 2015 Guidance . . .. Where in-stream data was lacking, stream segments were evaluated using desktop aerial reconnaissance for potential in-stream habitat and hydrologic alteration associated with channel modifications, stream diversion or augmentation, and to evaluate the level of associated development and use of best management practices to mitigate hydromodification.[34]

But, as detailed above, the State Board has impermissibly ignored this portion of the SD RWQCB Staff Report.

2.14

7. Sound Public Policy Dictates that Flow-Impaired Waterways Must Be Identified

States, including California, have identified and are identifying flow-impaired waterways in their Integrated Reports not only because the Clean Water Act calls for it and U.S. EPA Guidance reinforces it. They also do so because it makes smart policy sense. Why would a state limit the amount of information it releases, information that could help it make better decisions about how to prioritize its resources? If the main problem with a waterway is not temperature or dissolved oxygen but flow, for example, then that information should be available so the best permitting and resource allocation decisions can be made to protect affected waterways.

2.15

Identification of flow-impaired waterways is also important because those listings help the public exercise their own responsibility to help improve waterway health. U.S. EPA agreed in its Guidance, stating that "a variety of watershed restoration tools and approaches to address the source(s) of the impairment" exist even in the absence of TMDLs, increasing the importance of full and complete identification for impaired waterways.[35]

2.16

Hydrologic impairment listings also can and should be used in CEQA analyses of proposed projects that could further impact the flow of identified waterways, thus preventing additional damage to already-impacted waterways and fish. ELC has prepared and submitted extensive comments to the state on the numerous policy benefits of properly identifying flow-impaired waterways.[36]

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[34] SD RWQCB, "Clean Water Act Sections 305(b) And 303(d) Integrated Report for The San Diego Region (July 2016); at: http://www.waterboards.ca.gov/sandiego/water_issues/programs/303d_list/docs/IR_RB_StaffReport_R9_07-11-16_Clean.pdf, pp. 13-14.

[35] For an analysis of water governance tools that could effectively restore flows to California waterways, *see* Linda Sheehan *et al.*, "California Water Governance for the 21st Century" (2017), available at: http://bit.ly/CAwatergovernance.

[36] Letter from ELC, CCKA to SWRCB, "Inclusion of Impairments Due to Low Flow in the California 2012 Section 303(d) List" (May 15, 2013); at: http://bit.ly/SWB303d.

2.17

8. Water Bodies Can and Should Be Placed in *All* Relevant Categories of Identification

The draft Staff Report states that "[t]o meet CWA section 305(b) requirements of reporting on water quality conditions, the Integrated Report places each assessed waterbody into one of five *non-overlapping* categories based on the overall beneficial use support of the waterbody."[37] This statement appears to limit the State Water Board to placing water bodies in only one category, an interpretation presumably reflected in the recommendation to include zero flow-impairment listings in Category 4C.

This approach is simply illegal and incorrect. Consistent with the requirements of sections 303(d) and 305(b) of the Clean Water Act, the U.S. EPA has been quite clear that water bodies can be placed into multiple categories, and in fact should be in order to provide the best available information to U.S. EPA and Congress. As explained by the SD RWQCB in its Staff Report:

> It is important to note that USEPA recommended in its 2015 guidance that "States assign all of their surface water segments to **one *or more* of five reporting categories**"....[38]

U.S. EPA reiterated this point in its joint report with USGS, stating that "EPA's guidance has noted that **assessment categories *are not mutually exclusive*, and waters may be placed in more than one category (for example, categories 4C and 5)**."[39] Accordingly, flow impairments should be reflected in Category 4C *whether or not* there is a pollutant present, the approach taken recently by the SD RWQCB. Otherwise, the state is conflating the Section 303(d) and 305(b) reports rather than combining them, ignoring its Section 305(b) responsibilities in the process.[40] Because the state must comply with *both* Sections 305(b) and 303(d), it must provide information relevant to all categories applicable to a single water body.[41] The Integrated Report does not meet these mandates.

2.18

Like the SD RWQCB, other states demonstrate the correct understanding in accordance with U.S. EPA Guidance by placing water bodies (with U.S. EPA approval) in Category 4C for pollution, even when other impairing pollutants are identified for the same segment. For example, Tennessee lists Egypt Hollow Creek as impaired due to flow alterations under Category 4C and impaired due to low dissolved oxygen and manganese under Category 5. Further, Tennessee places *both* impairments on their 303(d) List (*see* Figure 2 below).

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[37] Draft Staff Report, *supra*, p. 18 (emphasis added).
[38] SD RWQCB, *supra*, p. 14 (emphasis added).
[39] U.S. EPA/USGS Report, *supra*, Ch. 5 (emphasis added).
[40] 33 U.S.C. §§ 1315(b), 1313(d); 40 C.F.R. §§ 130.7, 130.8.
[41] This is consistent with the statutory intent of the CWA, which distinguishes the related Section 305(b) reports and Section 303(d) lists. In 2002, the EPA for the first time released guidance calling for a single "Integrated Report" merging Section 305(b) water quality reports and Section 303(d) lists. *See* U.S. EPA, 2002 Integrated Water Quality Monitoring and Assessment Report Guidance.

Final Version 2012 303(d) LIST (Duck River Watershed cont.)

Waterbody ID	Impacted Waterbody	County	Miles/Acres Impaired	CAUSE / TMDL Priority		Pollutant Source	COMMENTS
TN06040003 041 – 1100	DOG BRANCH	Hickman Maury	13.8	Escherichia coli	NA	Pasture Grazing	Category 4a. EPA approved a pathogen TMDL that addresses the known pollutant.
TN06040003 050 - 0620	GRAB CREEK	Dickson	3.94	Escherichia coli	H	Pasture Grazing Discharges from MS4 area	Stream is Category 5. One or more uses are impaired.
TN06040003 060 – 0700	EGYPT HOLLOW CREEK	Humphreys	4.68	Flow Alterations Low dissolved oxygen Manganese	NA L H	Upstream Impoundment	Category 5. Flow is Category 4C, impacts not due to a pollutant.
TN06040003 062 – 3000	BLUE CREEK	Humphreys	5.1	Nitrate+Nitrite Total Phosphorus Low dissolved oxygen Solids Escherichia coli	M M L L NA	Municipal Point Source	McEwen STP. Category 5. EPA approved a pathogen TMDL that addresses some of the known pollutants.

Figure 2: Tennessee 303(d) List with Both Category 4c and 5 Impairments for a Single Waterbody Segment
(Source: Tennessee Department of Environmental and Conservation, "Year 2012 303(d) List" (Jan. 2014)).

Idaho similarly lists waterway segments as impaired under both Category 4C and Category 5. Appendix I of the latest Idaho Integrated Report contains 36 pages (7,342 river/stream miles) of Category 4C impairments, including numerous waterways listed as impaired for "low flow alterations"; many of these are also dual-listed for pollutant impairments.[42]

In another example, Montana classifies waterways under Category 4C when there is *only* a pollution impairment. If there is a pollution *and* a pollutant impairment, then Montana lists the waterway under Category 5, and compiles all of the impairment causes in Appendix A ("Impaired Waters") (*see* Figure 3). This is consistent with the "single-category" approach described in the 2006 U.S. EPA Guidance. Montana develops TMDLs only for the pollutant impairments, but develops the full Impaired Waters list under Category 5 to provide the public and decisionmakers with a clear picture of the state of the health of its waterways – precisely what sections 303(d) and 305(b) require.

[42] *See* https://www.deq.idaho.gov/media/1117323/integrated-report-2012-final-entire.pdf. Appendix J consists of Category 5 waterways, which can be cross-referenced to easily see the dual listings. *Id.*

Appendix A: Impaired Waters

HUC 10020007 Madison Watershed Upper Missouri Tribs.

TMDL Planning Area	ID305B	Waterbody Name/Location	Category	Size	Units	Use Class	AQL	AG	DW	Rec	Cause Name	Source Name
Madison	MT41F004_020	O'DELL SPRING CREEK, headwaters to mouth (Madison River)	5	13.194	MILES	B-1	N	F	N	F	High Flow Regime	Grazing in Riparian or Shoreline Zones
											Other anthropogenic substrate alterations	Habitat Modification - other than Hydromodification
											Physical substrate habitat alterations	Impacts from Hydrostructure Flow Regulation/modification
												Irrigated Crop Production
												Source Unknown
Madison	MT41F004_040	INDIAN CREEK, Lee Metcalf Wilderness boundary to mouth (Madison River)	4C	6.34	MILES	B-1	N	F	F	N	Low flow alterations	Impacts from Hydrostructure Flow Regulation/modification
												Irrigated Crop Production
Madison	MT41F004_050	JACK CREEK, headwaters to mouth (Madison River, T5S R1W S23)	5	15.18	MILES	B-1	N	F	F	N	Alteration in stream-side or littoral vegetative covers	Grazing in Riparian or Shoreline Zones
											Low flow alterations	Irrigated Crop Production
											Physical substrate habitat alterations	Natural Sources
											Sedimentation/Siltation	Streambank Modifications/destablization
Madison	MT41F004_060	NORTH MEADOW CREEK, headwaters to mouth (Ennis Lake)	5	18.53	MILES	B-1	F	F	F	N	Low flow alterations	Channelization
											Phosphorus (Total)	Irrigated Crop Production
											Physical substrate habitat alterations	Natural Sources
											Sedimentation/Siltation	Streambank Modifications/destablization

***Figure 3**: Montana listing of both pollutant- and pollution-impaired waterways on a single list of Impaired Waters.* (*Source: Montana DEQ, "Appendix A: Impaired Waters"*).

2.19

Even within California, as described above, there is precedent of dual listings under Category 4C and Category 5. First, the SD RWQCB listed waterways as impaired due to hydromodification and habitat alteration in Category 4C, whether with a Category 5 listing or alone. Explaining its decision, the SD RWQCB's Staff Report echoes the EPA's finding, stating that Category 4C listed waters "may be a priority for restoration by a Regional Water Board." Further, the 2014 and 2016 California Integrated Report itself notes the dual Category 5 and Category 4C listing for the Ventura River Reach 4. California's 303(d) list (or, alternatively, the 305(b) Report) in full similarly should accurately reflect *all* sources of impairment, regardless of dual pollutant/pollution listings.

2.20

9. Reasonably Available Data Exist and Have Been Provided in Support of the Listing of Waterways as Hydrologically Impaired

As detailed in Attachment A, and as evident based on significant, readily available information, the lines of evidence for hydrologic impairment are strong for numerous California waterway segments, including but not limited to the Salinas River, Carmel River, San Clemente Creek, Big Sur River, and Santa Maria River (Region 3); the San Joaquin River, inflow to the Delta, and the San Francisco Bay-Delta, outflow to Suisun Bay and San Francisco Bay (Region 5); those 30 waterways already properly identified as hydrologically-impaired in Region 9's approved Integrated Report (Region 9); the Napa River (non-tidal) (Region 2); the Ventura River (Reaches 3 and 4) and the Santa Clara River (Region 4); and the Santa Ana River (Reaches 3 and 4) (Region 4).

2.21

Federal regulations state that states must evaluate "all existing and readily available information" in developing their 303(d) lists and prioritizations.[43] Readily available data includes the 305(b) report.[44] The SWRCB's Executive Director reinforced the breadth of this requirement in a memorandum on the scope of listing regulations at 40 CFR § 130.7(b)(5).[45] This information must include flow, a position recently reinforced by U.S. EPA, who stated that the integrated reporting format is key to "acknowledge the important role of flow in contributing to water-body impairments."[46]

Attachment A provides summaries of such information, including in regards to the severe dewatering of waterways across California. The State Water Board has more than enough data needed to list waterways, at a minimum those listed above, which it may not ignore in its development of the Integrated Report.[47] Proper, timely identification under the Clean Water Act of all hydrologically impaired waterways in California Integrated Report is required and critical to setting appropriate plans and priorities that will help reverse significant declines in aquatic species.

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[43] 40 CFR § 130.7(b)(5).
[44] *See Thomas v. Jackson*, 581 F.3d 658, 661 (citing 40 C.F.R. § 130.7(b)(5)(i)).
[45] At: http://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/impaired_waters_list/clarification_30jan07.pdf (placing "no limits" on the data that can be provided to the RWQCBs for development of the Integrated Report's 303(d) and 305(b) lists).
[46] U.S. EPA/USGS Report, *supra*, Ch. 5.
[47] In the draft Integrated Report the State Board takes the position that it need not approve the 305(b) reports submitted by the various regional boards, and it is unclear whether the State Board has reviewed those reports. See Draft Staff Report, pp. 1-2. The regulations implementing section 303(d) require the State Board to review the 305(b) reports when developing the 303(d) list. *Thomas v. Jackson*, 581 F.3d 658, 661 (citing 40 C.F.R. § 130.7(b)(5)(i)). Unless the State Board takes the current 305(b) reports into consideration in issuing the final Integrated Report, the 303(d) list will violate the Clean Water Act. In addition, the State Board must consider information submitted by the public. 40 C.F.R. § 130.7(b)(5)(iii) ("At a minimum "all existing and readily available water quality-related data and information" includes but is not limited to all of the existing and readily available data and information about the following categories of waters: .... Waters for which water quality problems have been reported by local, state, or federal agencies; members of the public; or academic institutions."). The State Board may not legally impose date restrictions on what data is available.

2.22

In sum, we once again urge the State Water Board to follow the lead of the SD RWQCB, as well as U.S. EPA and numerous other states, in identifying flow- and otherwise hydrologically-impaired waters in the region's Integrated Report. Otherwise, California will not only fall behind as an environmental leader, but failing to comply with the Clean Water Act as detailed above will impede the state's ability to protect nature's right to thrive and adequately prepare for the next drought.

Thank you for the opportunity to submit these comments. If you have any questions or would like additional information, please do not hesitate to contact us.

Sincerely,

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Attachment A:	Data Supporting Listings for Hydrological Impairment
Attachment B:	Comment Letter from ELC to San Diego RWQCB, "Comment – CWA Section 305(b)/303(d) Integrated Report" (Aug. 8, 2016)
Attachment C:	Public Documents Re: 303(d)/305(b) Listings Due to Altered Flows and Supporting Scientific Evidence (also at: http://bit.ly/2u0cQFG)
Attachment D:	Ten Sample States Listing Waterways as Impaired Due to Causes Related to Altered Flows

ATTACHMENT A

Data Supporting Listings for Hydrological Impairment

2014 and 2016 California Integrated Report

Region 3 - Central Coast

ATTACHMENT 1:

Fish Declines Associated with Hydrologic Impairments in Select Waters

Salinas River	Around the beginning of the 20th century, the Salinas River and tributaries supported a large population of steelhead trout. In the early 1960s, the average Salinas steelhead run was estimated to consist of about 500 individuals.[1] Today, only small populations of steelhead remain in a handful of the Upper Salinas tributaries.[2] There is some suitable habitat for steelhead in the Upper Salinas Basin and possibly remnant steelhead populations. However, habitat in the Upper Salinas is of lower quality and is less extensive than that in the Arroyo Seco and its tributaries...The Upper Salinas is also less accessible for steelhead than the Arroyo Seco (EDAW 2001).[3] Causes of Decline Large-scale water storage projects on the upper mainstem Salinas River and the Nacimiento and San Antonio rivers preclude steelhead access to the majority of historical spawning and rearing habitat, and are the primary cause of the steelhead population's decline in the watershed. Although some suitable habitat remains downstream of the Nacimiento and San Antonio dams and in several tributaries to the upper Salinas River, spawning steelhead can rarely access this habitat due insufficient migration flows (Smith 1994; NMFS 2001; NMFS 2007). In addition to the impacts to adult upstream migration, the Nacimiento and San Antonio dams have reduced significantly springflows such that smolts cannot migrate from upstream rearing habitat to the ocean (NMFS 2005).[4] In the early 1940's, the Salinas River was dammed near the town of Santa Margarita to provide water for the community of San Luis Obispo…The dam[s] are believed to be a major reason for the decline in steelhead in the Upper Salinas River.[5] According to Casagrande et al. (2003), the Salinas River Basin historically supported runs of steelhead and possibly Chinook salmon but now supports only "a small, probably declining run of steelhead." Concerns regarding the decline of the Salinas River Basin steelhead population include flow-related passage barriers, low summer base flows, and loss of habitat.[6]

[1] Becker, G.S., K.M. Smetak, and D.A. Asbury. 2010. Southern Steelhead Resources Evaluation: Identifying Promising Locations for Steelhead Restoration in Watersheds South of the Golden Gate. Cartography by D.A. Asbury. Center for Ecosystem Management and Restoration. Oakland, CA. Pg. 70; at: http://www.opc.ca.gov/webmaster/ftp/project_pages/salmon_and_steelhead/CEMAR/Southern_Steelhead_Resources_Evaluation.pdf.

[2] Upper Salinas - Las Tablas Resource Conservation District. Watershed Fisheries Report and Early Actions: A Study of the Upper Salinas River and Tributaries. March 2002. Pg. 2; at: http://www.us-ltrcd.org/wp-content/uploads/2012/04/Watershed_Fisheries_Report.pdf.

[3] Becker, *supra*, at 71.

[4] *Id.*

[5] Upper Salinas - Las Tablas Resource Conservation District, *supra* at 2.

[6] Monterey County Water Resources Agency. Salinas Valley Water Project Annual Fisheries Report for 2010. April 2011. Pg. 1; at:

Santa Clara River	The Santa Clara River appears to have supported a large steelhead population historically. A 1946 issue of the DFG journal relays, "The Division of Fish and Game reports large and consistent [steelhead] runs into Ventura and Santa Clara rivers..." (DFG 1946b). Based on run size estimates for Matilija Creek and comparison of habitat information between Matilija Creek and the Santa Clara River watershed, one researcher projected a run of about 9,000 individuals (Moore 1980b). The assessment report characterized the estimate as "reasonable" and "conservative." By 1974 the run had declined sufficiently for DFG staff to state, "...there is no fishery to speak of in the [Santa Clara] river now" although it notes that "...there are some [steelhead] now that come up during large flows" (DFG 1974). A 1982-1984 study similarly indicated that a small number of adult steelhead spawned in the Santa Clara system and that the watershed supported smolt production (DFG 1985). A 1998 report summarizing the results of five years of fish passage monitoring at the Vern Freeman Diversion noted that the 414 smolts captured in 1997 likely comprised "nearly all of the outmigrant steelhead" (Entrix 1998). According to NMFS, less than ten adult steelhead were observed during the period from 1994 to 2000 (NMFS 2000).[7] <u>Causes of Decline</u> Water diversions appear to have been impacting Santa Clara River steelhead populations for many decades. Notes from 1947 state, "Below the intake the stream goes dry as all of the water is diverted... There are many small sand diversion dams across the stream and when the steelhead start running there is sufficient flow to wash out these diversions. It is difficult for the young steelhead returning" (DFG 1951b). A report from 1951 states, "The lower reaches of the Ventura and Santa Clara Rivers are of secondary importance as a means of access by which steelhead trout migrate upstream from the ocean to headwaters tributaries. With increased water development and reduced runoff to the oceans, these runs will unfortunately continue to diminish in size and importance" (DFG 1951b). The Santa Clara River system includes an important water supply feature, the Vern Freeman Diversion Dam, which was constructed in 1991 at about stream mile ten. A fishway was provided at the facility that became operational in 1991. The 2005 Santa Clara River assessment states, "While conditions are poor for spawning and sub-optimal for rearing in most reaches, the mainstem [Santa Clara] is a critical corridor for upstream and downstream steelhead movement" (Stoecker and Kelley 2005). Specifically, bypass flows at the diversion dam can affect migration opportunities.[8]
Carmel River	In a 1983 DFG letter, the average historical steelhead run (prior to dam construction) in the Carmel River was estimated to comprise 8,000 adults annually (DFG 1983a). A draft consultants' report from 1982 offered the following summary of Carmel River steelhead: "The Carmel River supports an annual run of steelhead that the Department of Fish and Game estimates averages about 2000 adults per year. Adults...spawn in the lower Carmel between Shulte Road and the San Clemente Dam. Some climb the ladder at San Clemente, spawn in the river between the two dams or in the tributaries of that reach, and some are passed over Los Padres to spawn in the upper Carmel and its tributaries" (Kelley 1983).[9]

http://www.mcwra.co.monterey.ca.us/fish_monitoring/documents/2010%20Salinas%20Basin%20Rotary%20Screw%20Trap.pdf.

[7] Becker, *supra* at 159.

[8] *Id.* at 160.

[9] *Id.* at 74.

	Causes of Decline Water supply has long been recognized as a primary factor limiting the Carmel River's potential steelhead production. Water demand in the Carmel River watershed far exceeds supply, which has reduced spawning and rearing habitat, particularly in the lower ten miles of stream, and has limited upstream migration of adults and downstream emigration of juveniles. The mechanism is described below: "Carmel River flows decrease in early summer, due to reduced runoff and water diversions... These diversions significantly alter the stream flows in the lower portions of the Carmel River to the extent that several miles of river are dewatered each summer and fall and a sand bar is formed at the mouth of the river. The dewatering of the stream channel significantly reduces rearing habitat below San Clemente Dam and strands early migrating juvenile trout in isolated pools in the lower river. Fish rescue operations are conducted by the Monterey Peninsula Water Management District in an effort to mitigate for water diversions. Fish rescued are transported and released into upstream reaches of perennial stream flow...[The] sand bar is artificially breached each winter in order to allow the upstream migration of steelhead from the ocean..." (DFG 1995). A watershed plan prepared for the Carmel River in 2004 lists additional factors that have been identified as limiting to the Carmel River steelhead population, including lack of spawning gravels in the reaches downstream of the San Clemente and Los Padres dams; lack of riparian vegetation; excess sediment deposits due to bank erosion, cattle grazing activities, and development; passage barriers; and lack of large woody debris. The report emphasizes the need to couple projects that address these problems with restoration of instream flows, stating, "Dealing with dams, erosion/sedimentation, water quality for aquatic life...[and] riparian habitat restoration...are irrelevant if the lack of surface flow continues to be a problem" (CRWC 2004, p. 8).[10] Water development, particularly illegal underflow pumping in the lower reach of the Carmel River by the California American Water Company (CAL-AM), has caused dewatering, a broadening of the channel, and loss of riparian habitat. As a result of over appropriation of water and the effects of the recent drought, the Carmel River did not flow to the ocean for a four-year period from 1987 to 1991.[11] The Carmel River "did not flow to the ocean for four years during the recent drought because of surface diversions and excessive groundwater pumping, and its native steelhead population is at a critically low level."[12]
San Clemente Creek	Erected at the confluence of the Carmel River and San Clemente Creek, the [San Clemente] dam essentially blocked 25 miles of prime spawning and rearing habitat for anadromous fish, including South-Central California Coast steelhead listed as threatened under the Endangered Species Act. It also damaged wildlife habitat by

[10] *Id.* at 75-76.
[11] Department of Fish and Game. Steelhead Restoration and Management Plan for California. February 1996. Pg. 186.
[12] *Id*. at 9.

	starving the downstream river of valuable sediment necessary for fish to lay their eggs in nests or redds.[13] A concrete ford on upper San Clemente Creek (Barrier 585-03) may present a partial barrier to migrating steelhead and should be assessed and modified if necessary in accordance with other barrier modification priorities… Seasonal recreational dams on San Clemente and Black Rock creeks have been observed to create passage problems (MPWMD 2004; M. Stoecker pers. comm.).[14]
Big Sur River	<u>Causes of Decline</u> A 2003 steelhead enhancement plan for the Big Sur River identified the "volume and intensity of visitor use" within Pfeiffer Big Sur and Andrew Molera State parks as a key limiting factor to the steelhead population in the watershed. The report states, "Where visitor use is concentrated, the visible impacts to salmonid habitat occur through trail erosion, trampling of riparian and instream habitat, and construction of rock dams and channel modifications. These instream activities may result in the degradation of spawning areas in late winter through spring and obstruction of juvenile passage throughout low flow periods."[15] The importance of lagoons to rearing steelhead is dependent in part on the lagoon's habitat characteristics, including its persistence, area and volume, water chemistry, invertebrate prey abundance, and instream cover (Smith 1987, Zedonis et al. 2007, Hayes et al. 2008). These habitat characteristics are in turn affected by streamflow, particularly high flow events with associated recruitment of sediments, woody debris, and fish.[16] High volume groundwater extraction in the lower portion of the Big Sur "impacts streamflows and essential habitat for juvenile steelhead."[17]
Santa Maria River	Steelhead use of the Santa Maria River has been consistently documented since the late 1800s, although data on historical run size estimates is lacking. A citation in a 2003 report states, "The last sizeable run of steelhead was in 1941 with a few adults reported in 1942-1943" (Titus et al. 2000, as cited in Stoecker 2003). Reports on the watershed indicate that the Santa Maria River is now dry a significant portion of the year and therefore does not offer substantial rearing habitat, except for the estuary, which may serve a critical function for steelhead rearing and is currently being studied as part of a larger instream flow.[18] <u>Causes of Decline</u> The Bureau of Reclamation's Twitchell Reservoir operations (on the Cuyama River) substantially affect the hydrology of the Santa Maria River, which serves as the

[13] NOAA Fisheries. A River Runs around it. Summer 2015; at: http://www.westcoast.fisheries.noaa.gov/stories/2015/08262015_san_clemente_dam.html.
[14] Becker, *supra* at 79.
[15] *Id.* at 82.
[16] Normandeau Associates, Inc. Fisheries and Habitat Assessment of the Big Sur River Lagoon, California. January 2012. Pg. 1; at: http://www.opc.ca.gov/webmaster/ftp/pdf/docs/Big%20Sur%20Lagoon%20Study%20Report%20Final%2001-13-12.pdf.
[17] Kurt Zimmerman, Tim Frahm and Sam Davidson. Recovering California Steelhead South of Santa Cruz. The Osprey: 75. May 2013. Pg. 17; at: http://caltrout.org/wp-content/uploads/2013/06/Recovering-California-Steelhead-South-of-Santa-Cruz.pdf.
[18] Becker, *supra* at 126.

	critical migration corridor for steelhead trout accessing habitat in the upper basin. Currently, water releases are made primarily on the basis of water supply considerations rather than habitat, and the Santa Maria River is consequently "dry most of the year in most years" (NMFS 2009). Groundwater withdrawals in the vicinity of the Santa Maria River also have been noted to reduce streamflow (Stoecker 2005).[19] Twitchell Dam, which impounds Twitchell Reservoir, was built in 1959 and first began operation in 1962.[20] Flow releases from Twitchell Reservoir have reduced the number of successful opportunities for both upstream and downstream steelhead migration along the Santa Maria River.[21] Low flows may limit successful passage of steelhead trout through the Santa Maria to spawning reaches.[22] The range of the Southern California Coastal distinct population segment (DPS) "extends from the Santa Maria River in the north to the Tijuana River in the south. NMFS estimates that historic steelhead numbers in this DPS over 45,000 fish, and anglers were still catching stringer-full of steelhead in the 1940s. Human development, in particular the construction and operation of dams and other water dicersions of dams and other water diversions, has caused this steelhead population to decline nearly 99%. Today only about 500 adult fish survive in the DPS."[23]

[19] *Id*. at 127.
[20] Stillwater Sciences and Kear Groundwater. 2012. Santa Maria River Instream Flow Study: flow recommendations for steelhead passage. Prepared by Stillwater Sciences and Kear Groundwater, Santa Barbara, California for California Ocean Protection Council, Oakland, California and California Department of Fish and Game, Sacramento, California. Pg. ES-4; at: http://www.stillwatersci.com/resources/2012SMR_Rec_Report_Final.pdf.
[21] *Id.* at ES-4.
[22] Grantham, T. E. and P. B. Moyle. 2014. Assessing flows for fish below dams: a systematic approach to evaluate compliance of California's dams with Fish and Game Code Section 5937. Center for Watershed Sciences Technical Report (CWS-2014-01), University of California, Davis. P: 74; at: https://watershed.ucdavis.edu/files/content/news/REPORT_5937_final_oct2014.pdf.
[23] Zimmerman, *supra*, at 17.

Region 5 - Central Valley

ATTACHMENT 1:

Declines in Fish and other Aquatic Species Associated with Hydrologic Impairments in the Delta and other Central Valley Waters

"There is wide consensus among aquatic ecologists that alteration of natural flow regimes often results in negative effects on native biota… In addition, it has been well established that degradation of river ecosystems can have negative effects on the ecosystem services that humans expect to derive from rivers, including commercial, recreational and subsistence fisheries, water purification, flood storage, recreation and aesthetic values."[1]

Central Valley waters, particularly the Delta, have experienced significant flow impairments due to water diversions and projects. Provided below are samples of studies and data specific to the Central Valley region and readily available to the state before August 31, 2010.[2] This data supports identification of Central Valley waters under CWA Section 305(b) (and potentially 303(d)) as hydrologically impaired. In particular, this information indicates that: fish abundance is correlated with flow; diversions and modifications have decreased flow and altered necessary aquatic habitat in Central Valley waterways; populations of fish and other aquatic species have plummeted as a result; and so these waterways must be identified in the Integrated Report as hydrologically impaired, including flow impairments. As noted by the State Water Board itself, "current flows are insufficient to protect public trust resources."[3]

A. Studies find fish abundance is correlated with flow

Alteration of flow regimes affects aquatic biodiversity and the structure and function of aquatic ecosystems.[4] The following readily-available studies and data from August 2010 and earlier, among others, support this finding:

- Both abundance and population growth in native fish species like longfin smelt and Chinook salmon are linked to freshwater inflows in the Bay-Delta Estuary.[5]
- Statistically significant relationships between annual abundance and freshwater outflow have been demonstrated for a diverse assemblage of species within the Estuary.[6]
- The magnitude, duration, timing, and source of Sacramento River inflows are important to all runs of Chinook salmon.[7]

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[1] Larry Brown and Marissa Bauer, "Effects of Hydrologic Infrastructure on Flow Regimes of California's Central Valley Rivers: Implications for Fish Populations," *River. Res. Applic*. (2009), p. 1; at: http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.364.7763&rep=rep1&type=pdf.

[2] Also provided to the state was an Appendix of data attached to joint comments submitted on August 30, 2010 by Linda Sheehan, CCKA *et al*., to Jeffrey Shu, SWRCB (CCKA *et al.* Letter); at: http://www.waterboards.ca.gov/water_issues/programs/tmdl/records/state_board/2010/ref4125.pdf.
The Appendix of Central Valley data submitted with the CCKA *et al.* Letter can be accessed here: http://bit.ly/2elymea.

[3] SWRCB, "Final Report on Development of Flow Criteria for the Sacramento-San Joaquin Delta Ecosystem" (Aug. 3, 2010) (Delta Flow Report), p. 2; at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/deltaflow/final_rpt.shtml.

[4] *Id*. at p. 100.

[5] Stevens, D.E. & and L.W. Miller, "Effects of river flow on abundance of young Chinook salmon, American shad, longfin smelt, and delta smelt in the Sacramento-San Joaquin River system," *North American Journal of Fisheries Management* (1983), 3:425-437.

[6] Delta Flow Report, *supra*, at p. 100.

[7] *Id.*

- The survival of fall-run Chinook salmon smolts through the Delta between Sacramento and Suisun Bay is positively correlated to flow and negatively correlated to water temperature, which increases as flow is reduced. Smolt survival increased with increasing Sacramento River flow at Rio Vista, with maximum survival observed at or above about 20,000 and 30,000 cfs from April through June.[8]
- Decreases in flow through the Estuary, increased temperatures, and the proportion of flow diverted through the Delta Cross Channel and Georgiana Slough on the Sacramento River are associated with lower survival in the Delta of marked juvenile fall-run Sacramento River salmon.[9]
- [T]he catch of Chinook salmon smolts at Chipps Island between April and June of 1978 to 2005 was positively correlated with mean daily Sacramento River flow at Rio Vista between April and June.[10]
- Increased reverse flows at Jersey Point reduce survival of salmon smolts migrating through the lower San Joaquin River.[11]
- A 2002 study found "strong, significant" correlations over "decades of monitoring" to have provided "powerful evidence" of the relationships between the abundance of numerous Bay-Delta aquatic species and flow:

WHAT DO THESE SPECIES HAVE IN COMMON?

SPECIES	NATIVE?	LIFE SPAN (YEARS)	RESIDENT/ MIGRATORY/ NURSERY REARING	REPRODUCES WHERE?	ABUNDANCE CORRELATED WITH FLOW?
Chinook Salmon	Yes	3-5	Anadromous	River	YES
Striped Bass	No	4-10	Anadromous	River	YES
Green Sturgeon	Yes	Decades	Anadromous	River	YES
Delta Smelt	Yes	1	Resident	Delta	YES
Longfin Smelt	Yes	1-3	Resident/ Migratory	Delta/ Suisun	YES
Starry Flounder	Yes	7-8	Nursery Rearing	Ocean	YES
Sacramento Splittail	Yes	5-7	Resident	Shallow Freshwater	YES
American Shad	No	5-7	Migratory	River	YES
Staghorn Sculpin	Yes	1-3	Resident	Ocean/ Estuary	YES
Leopard Shark	Yes	Decades	Nursery Rearing	Ocean/ Bay/ Estuary	YES
Bay Shrimp	Yes	1.5-2.5	Nursery Rearing	Ocean	YES

Figure 9: The relationships between freshwater flow and species abundance are widespread. The specific mechanisms by which flow affects abundance, and the relative importance of mechanisms are likely to vary for different species (Kimmerer 2002b); however, the strong, significant correlations that persist across decades of monitoring provide powerful evidence of the benefits of freshwater flow to San Francisco Bay's fish and wildlife populations.

Figure 1: The abundance of Chinook Salmon, Striped Bass, Green Sturgeon, Delta Smelt, Longfin Smelt, Sacramento Spittail and American Shad are all correlated with flow. Kimmerer, W.J. 2002b. "Physical, biological, and management responses to variable freshwater flow into the San Francisco Estuary," *Estuaries* 25:1275–1290.

[8] CCKA *et al.* Letter, Appendix, *supra*, pp. 36, 53.
[9] *Id.* at p. 53.
[10] *Id.* at pp. 41-46, 54.
[11] Delta Flow Report, *supra*, p. 124.

B. Over-diversion and hydromodification have reduced flow and altered necessary habitat

Diversions and modifications to Central Valley waterways have resulted in altered habitats and reduced flows that have impaired life support for fish and other aquatic species. The following readily-available studies from August 2010 and earlier, among others, support this finding:

- The Central Valley is comprised of "an extensive system of hydrologic infrastructure, including dams, reservoirs, diversions and aqueducts."[12]
- The alteration of flows below dams is generally considered to be the "most serious threat to ecological sustainability of rivers."[13]
- Dams strongly impact the growth rate of Chinook salmon populations downstream and increase the probability of future extirpations.[14]
- Rivers in the Sacramento River drainage are characterized as having "reduced winter-spring discharges and augmented discharges in other months," and waterways of the San Joaquin River drainage area have "reduced discharges in all months but particularly in winter and spring."[15]
- Net OMR [Old and Middle Rivers] reverse flows have increased in both magnitude and frequency with the development of the California water projects and are detrimentally affecting biotic resources in the Delta.[16]
- The construction of large dams and water conveyance structures has reduced stream-flows in the Sacramento and San Joaquin rivers to the detriment of wetland areas in the Central Valley and in the Delta.[17]
- The San Joaquin River has lost most of its natural summer flows because the majority of the water is exported via the Friant project or diverted from the major tributaries for use within the basin.[18]
- The State Water Project (SWP) began pumping additional water from the south Delta to the California Aqueduct in 1968. Annual SWP Delta diversions have increased steadily, reaching a peak in 1989 of more than 3 maf.[19]
- In addition to Delta Exports, the volume of the Estuary's freshwater supply has been depleted by upstream diversions and in-Delta use, with total diversion growing from about 1.5 maf to nearly 16 maf. As a result, diversions have reduced annual Delta outflow by more than one-half on several occasions during the late 1970s through the late 1990s.[20]

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[12] Brown and Bauer, *supra*, p. 3.
[13] Grantham, T. E. and P. B. Moyle, "Assessing flows for fish below dams: a systematic approach to evaluate compliance of California's dams with Fish and Game Code Section 5937," Center for Watershed Sciences Technical Report (CWS-2014-01), University of California, Davis (2014), p. 5; at: https://watershed.ucdavis.edu/files/content/news/REPORT_5937_final_oct2014.pdf, citing data within the scope of this listing process, including: Bunn, S. E. & A. H. Arthington, "Basic principles and ecological consequences of altered flow regimes for aquatic biodiversity," *Environmental Management* 30(4):492-507 (2002); Nilsson, C. *et al*, "Fragmentation and flow regulation of the world's large river systems," *Science* 308(5720):405-408 (2005); Dudgeon, D. *et al*., "Freshwater biodiversity: Importance, threats, status and conservation challenges," *Biological Reviews* 81(2):163-182 (2006).
[14] Hoekstra J.M., Bartz K.K., Ruckelshaus M.A., Moslemi J.M. & Harms T.K., "Quantitative threat analysis for management of an imperiled species: Chinook salmon (Oncorhynchus tshawytscha)," *Ecological Applications* (2007), 17:2061–2073; McClure M.M., Holmes E.E., Sanderson B.L. & Jordan C.E., "A large-scale, multispecies assessment: anadromous salmonids in the Columbia River basin," *Ecological Applications* (2003), 13:964–989.
[15] Brown and Bauer, *supra*.
[16] Delta Flow Report, *supra,* p. 123.
[17] The LTMS Agencies, "Long-Term Management Strategy (LTMS) for the Placement of Dredged Material in the San Francisco Bay Region," Final Report (October 1998), Vol. 1, pp. 4-8; at: http://bit.ly/2enhBmd (LTMS Report).
[18] Delta Flow Report, *supra*, p. 33.
[19] LTMS Report, *supra*.
[20] *Id.*

- The combined effects of water exports and upstream diversions reduced average annual net outflow (difference between the sum of freshwater inflows to the Delta and the sum of exports and net in-Delta consumptive uses) from the Delta from unimpaired conditions by 33% and 48% during the 1948-1968 and 1986-2005 periods, respectively.[21]
- In wet years, diversions reduce outflow by 10 to 30 percent. In dry years, diversions reduce outflow by more than 50 percent. During recent drought years, diversions reduced annual Delta outflow by more than 70 percent. Outflow reductions have primarily occurred during winter and spring, when freshwater flows are particularly important for many estuarine species.[22]

C. Fish and other aquatic species populations have plummeted as a result

If there are insufficient flows and inadequate aquatic habitat, fish and other aquatic species will not succeed. Indeed, populations of these species have demonstrably plummeted in recent years, to the point where a number are now listed as threatened or endangered. The following readily-available studies from August 2010 and earlier, among others, support this finding.

- Multiple studies based on readily available data (*e.g.*, from CDFW) demonstrate that salmon abundance drops when Delta pumping increases. Compiled information includes the following:

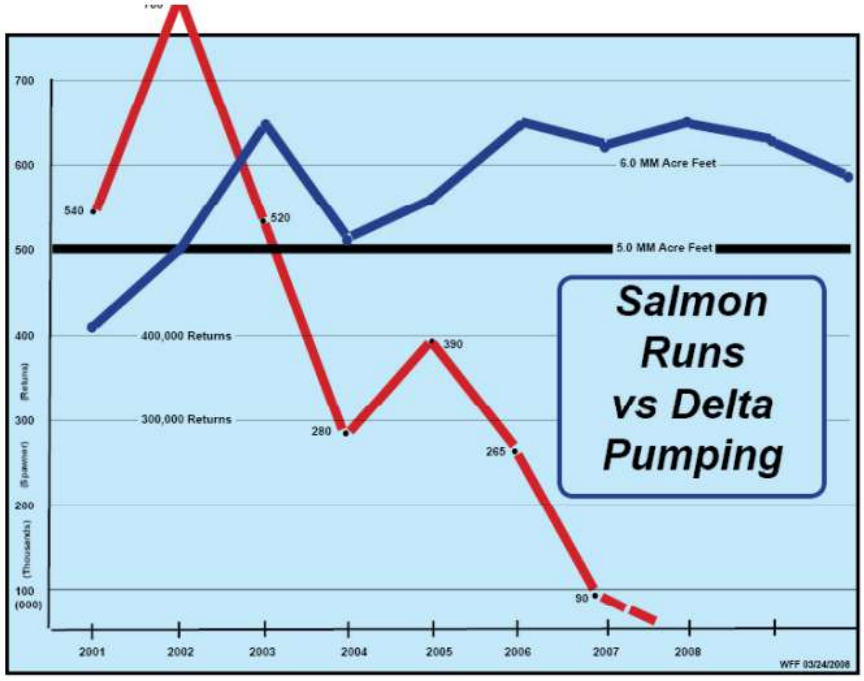

Figure 2. Chinook Salmon Sacramento fall-run dropped 97% from a 2002 return and harvest count of 1,1488,000 to 39,500 in 2009. Export pumping from the Delta was found to be the number one reason for the salmon declines. Water4Fish (2009); at: http://water4fish.org/.

[21] Delta Flow Report, *supra,* p. 28.
[22] LTMS Report, *supra*.

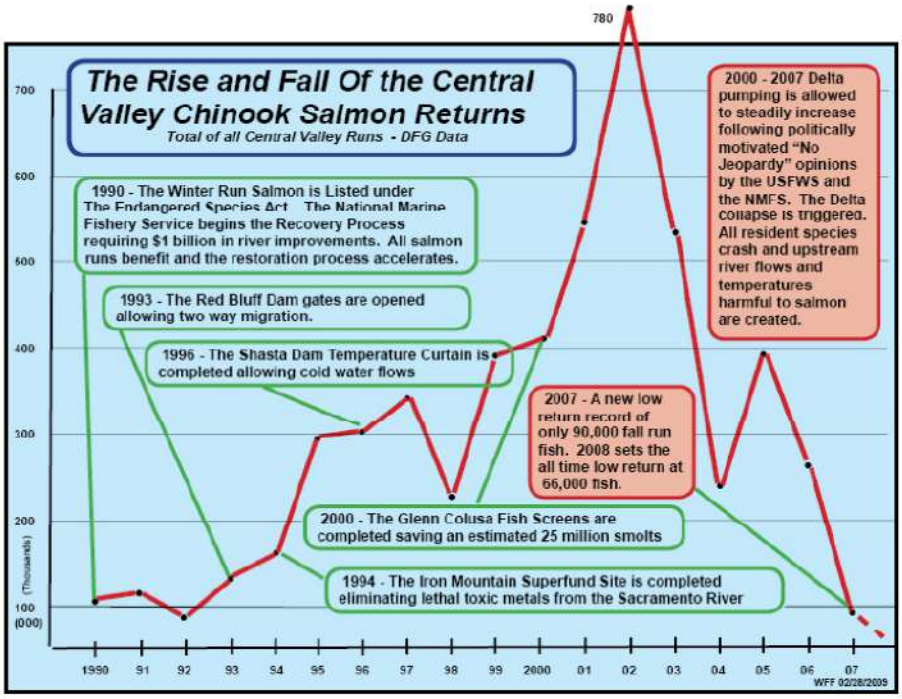

Figure 3. Total of all Central Valley Chinook Salmon Runs. Lowest return on record was in 2008, tied to increased Delta pumping. Water4Fish (2009); at: http://water4fish.org/.

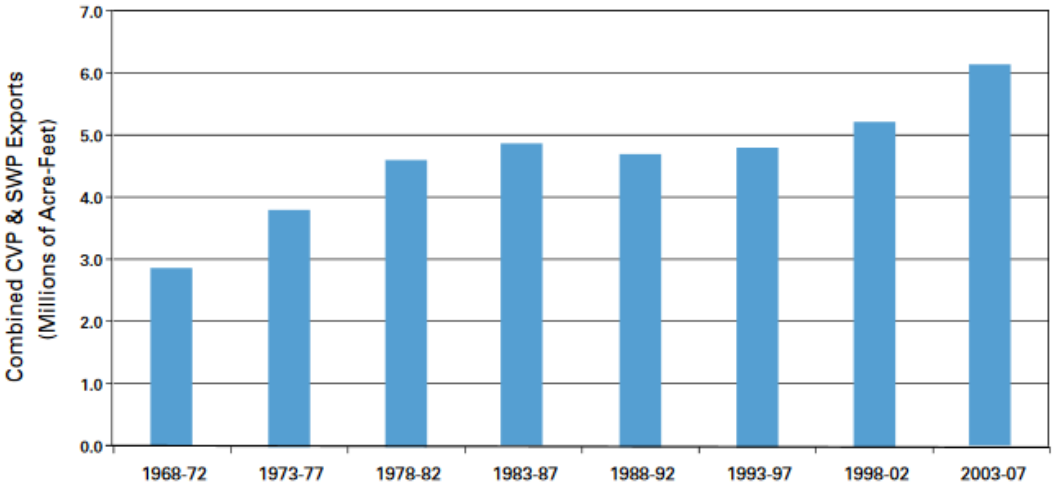

Figure 4. Five Year Averages of Combined Central Valley and State Water Projects Delta Exports. NRDC, "How Water Management in the Bay-Delta Threatens the Future of California's Salmon Fishery" (July 2008); at: https://www.nrdc.org/sites/default/files/salmon.pdf.

- Delta smelt require brackish habitat that forms when fresh water reaches the upper estuary in September and October for spawning.[23] Due to increased water exports, reduced freshwater flows and therefore habitat has contributed to the decline of smelt to near extinction.[24]
- Adult Chinook salmon rely on fall freshwater inflows to provide adequate water quality conditions for their return migration[25] and help orient them towards their native spawning grounds.[26]
    - Runs of adult salmon were once 300,000-500,000 or more per year in the San Joaquin River drainage area. In 1990-91, less than 1,000 adult salmon were present in the San Joaquin River drainage.[27]
    - From the 1980s to the 2000s, San Joaquin basin fall-run Chinook salmon escapement numbers have declined by half, from approximately 26,000 fish to 13,000 fish, in large part due to lack of flow.[28]
    - The decline in escapement on the Tuolumne River from 130,000 salmon in the 1940s to less than 500 in recent years is primarily due to inadequate minimum instream flow releases from La Grange Dam in late winter and spring during non-flood years. [29]
    - Viable populations of spring-run salmon are now rare. Populations in Mill, Deer, and Butte creeks are small and isolated.[30] Shortly after construction of Friant Dam, spring-run were extirpated on the San Joaquin River. Since 1970, estimates of spring-run populations in the Sacramento River have been as low as 3,000 fish.[31]
- Sacramento winter-run Chinook salmon (Oncorhynchus tshawytscha) is listed as endangered pursuant to the CESA and ESA. Central Valley spring-run Chinook salmon (O. tshawytscha) is listed as threatened pursuant to both the CESA and ESA. Central Valley fall/late fall-run Chinook salmon (O. tshawytscha) are classified as species of special concern by the National Marine Fisheries Service (NMFS). Central Valley steelhead (O. mykiss) is listed as threatened under the ESA Southern Distinct Population Segment of North American green sturgeon (Acipenser medirostris) is listed as threatened under the ESA.[32]

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[23] Feyrer, F., K. Newman, M. Nobriga, and T. Sommer, "Modeling the Effects of Future Outflow on the Abiotic Habitat of an Imperiled Estuarine Fish," *Estuaries and Coasts* (2010), 34:120-128; Moyle, P.B., *Inland Fishes of California* (Univ. of California Press, Berkeley 2002).
[24] Delta Flow Report, *supra,* pp. 108-09; Moyle, P.B., *Inland Fishes of California*, *supra*.
[25] Jassby, A. D. and E. E. Van Nieuwenhuyse, "Low dissolved oxygen in an estuarine channel (San Joaquin River, California): Mechanisms and models based on long-term time series," *San Francisco Estuary and Watershed Science* (2005), 2:1–33.
[26] Healy, M.C., *Life history of Chinook salmon (Oncorhynchus tshawytscha), in Pacific salmon life histories*, (Univ. of British Columbia Press 1991), pp. 311-393; Quinn, T.P., *The behavior and ecology of Pacific salmon and trout*, (Univ. Washington Press, Seattle 2005).
[27] Brown, L.R. and Moyle P.B., "Distribution, Ecology, and Status of the Fishes od the San Joaquin River Drainage," Calif. Fish and Game (1993), 9(3)96-114, p. 111; at: http://www.waterboards.ca.gov/water_issues/programs/tmdl/records/region_5/2006/ref381.pdf.
[28] CCKA *et al.* Letter, Appendix, *supra*, p. 55.
[29] *Id.*
[30] *Id*. at p. 51.
[31] *Id.*
[32] Delta Flow report, *supra*, p. 20.

D. The Delta and other Central Valley waterways must be identified as hydrologically impaired, including flow impairments

Federal biologists and hydrologists concluded that current water pumping operations in the Federal Central Valley Project and the California State Water Project should be changed to ensure survival of winter and spring-run Chinook salmon, Central Valley steelhead, the southern population of North American green sturgeon and Southern Resident killer whales, which rely on Chinook salmon runs for food.[33]

The data provided in the sections above shows how abundance of fish and other aquatic species in the Central Valley has declined due to hydrological impairments, including from over-diverted flows. The State Water Board has confirmed their knowledge of the links between flow and impairment in their 2010 Delta Flow report, stating among other things that "[T]he provision of sufficient flows….is intended to promote increased abundance and improved productivity for longfin smelt and other desirable estuarine species."[34] In addition, the State Water Board recommended in its report that Delta outflow criteria be determined to "halt the population decline and increase populations of native species as well as species of commercial and recreational importance."[35]

Not only has the Board acknowledged that species have declined due to hydrological impairments, but they have also recognized that "flow-related factors affect public trust resources," noting that "[f]low affects water quality, food resources, physical habitat, and biotic interactions"[36] and that "flow modification is one of the few immediate actions available to improve conditions to benefit native species."[37]

Clearly, the State Water Board recognizes that altered hydrology, including low flows, have decimated fish populations by impairing waterways as necessary habitat. The State Water Board also expressed the state needs to identify the "magnitude, duration, timing, and quality of Delta outflows necessary to support viable populations of these species."[38] Proper identification under the Clean Water Act of all hydrologically impaired waterways in the Central Valley Water Board's Integrated Report is critical to the development of such a body of information and to guide sound policy decisions.

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[33] National Oceanic and Atmospheric Administration (NOAA), "NOAA Biological Opinion Finds California Water Projects Jeopardize Listed Species; Recommend Alternatives," (June 4, 2009); at: http://www.noaanews.noaa.gov/stories2009/20090604_biological.html

[34] Delta Flow report, *supra*, p. 98.

[35] *Id.*

[36] *Id*. at p. 39.

[37] *Id* at p. 40.

[38] *Id.*

Region 2 - San Francisco

FLOW-RELATED DECLINE OF THE NAPA RIVER (NON-TIDAL)

Pollution: Altered Flow

Beneficial Uses Being Impaired: Cold Freshwater Habitat, Warm Freshwater Habitat, Fish Migration, Preservation of Rare and Endangered Species, Fish Spawning, Wildlife Habitat, Commercial and Sport Fishing, Contact and Non-Contact Water Recreation.

Description: The Napa River (non-tidal) suffers from reduced flows due to human activities. Causes include groundwater pumping and direct surface water diversions within the Napa River watershed,[1] as exacerbated by periods of low rainfall. In regards to the former, excessive pumping of groundwater that is hydrologically connected to surface water has severely reduced Napa River instream flows. As a result, the Napa River (non-tidal) regularly becomes nearly or completely dry, clearly impairing beneficial uses.

The dewatering of the Napa River (non-tidal) negatively impacts numerous aquatic species, including populations of steelhead trout (listed as "threatened" under the federal Endangered Species Act[2]). These steelhead trout are part of the Central California Coast Steelhead Distinct Population Segment (DPS).[3] They have been suffering from a general population decline in the Napa River watershed ever since the 1940s,[4] including due to reduced flows. Reduced Napa River flows can strand steelhead trout in isolated pools and impede their ability both to reach tributaries to spawn[5] and outmigrate in the spring.[6] The dewatering of the Napa River also impedes juvenile growth, increases predation, and limits food and rearing habitat availability for steelhead trout, amongst other impacts.[7] Steelhead runs in the Napa River – once comprising 6,000 to 8,000 fish – are now estimated only to range from the hundreds up to 1,000.[8]

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[1] *See e.g.* Napa River Flow Enhancement Study, "Center for Ecosystem Management and Restoration" (2013), at
[2] *See* Federal Register, Vol. 71, No. 3, Final Rule, "Endangered and Threatened Species: Final Listing Determinations for 10 Distinct Population Segments of West Coast Steelhead" (Jan. 5, 2006).
[3] Federal Register, Vol. 71, No. 3, Final Rule, "Endangered and Threatened Species: Final Listing Determinations for 10 Distinct Population Segments of West Coast Steelhead" (Jan. 5, 2006).
[4] *See* Napa County Resource Conservation District, "Napa River Steelhead and Salmon Smolt Monitoring Program: Annual Report - Year 2," p. 4 (Aug. 2010) at: http://naparcd.org/wp-content/uploads/2014/10/NapaRiverSmoltMonitoringFinalReport2010.pdf (*citing* U.S. Fish and Wildlife Service, "Analysis of Fish Habitat of the Napa River and Tributaries, Napa County, California, with Emphasis Given to Steelhead Trout Production" (1968); K. R. Anderson, "Steelhead Resource, Napa River Drainage, Napa County," California Department of Fish and Game (1969); R.A. Leidy, G.S. Becker & B.N. Harvey, "Historical Distribution and Current Status of Steelhead/Rainbow Trout (Oncorhynchus Mykiss) in Streams of the San Francisco Estuary, California," Center for Ecosystem Management and Restoration (2005)).
[5] Napa River Watershed Steelhead and Salmon Monitoring Program, Napa County Resource Conservation District, at: http://naparcd.org/wp-content/uploads/2016/09/Fish-monitoring-fact-sheet-2016.pdf.
[6] "Milliken Creek - Steelhead Habitat Modeling and Instream Flow Study," prepared by Napa County Resource Conservation District, p. 2 (Dec. 2010), at: http://naparcd.org/wp-content/uploads/2014/10/Milliken_Flow_Study_Final_Report_Dec_2010.pdf.
[7] Stillwater Sciences and W.E. Dietrich, "Napa River Basin Limiting Factors Analysis: Technical Report," Prepared for the San Francisco Regional Water Quality Control Board and California State Coastal Conservancy, p. 49 (2002), at: http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/TMDLs/napasediment/lfa_tech_report.pdf.
[8] Napa River Watershed Steelhead and Salmon Monitoring Program, Napa County Resource Conservation District, at: http://naparcd.org/wp-content/uploads/2016/09/Fish-monitoring-fact-sheet-2016.pdf.

A multitude of other species benefit from adequate Napa River flows, as well, including fall-run Chinook salmon and California freshwater shrimp (listed as "endangered" under the federal Endangered Species Act[9]). While many of Napa River's fall-run Chinook salmon may be "strays" from other basins,[10] they appear to be recolonizing their former habitat in the Napa River basin and require adequate flows to survive.[11] As for Coho salmon, they once numbered in the thousands but were extirpated entirely from the Napa River in the late-1960s.[12] The severe dewatering of the Napa River threatens other aquatic species with the same fate.

There is readily available information demonstrating the historic decline of Napa River (non-tidal) flows. For example, analyzing data from the Napa River at St. Helena stream gauge, fisheries biologist Patrick Higgins found "statistically significant declining trends in minimum 30-day average [], minimum 7-day average [], mean August, and mean September stream flow … for both the 1930-2013 and 1960-2013 time periods…."[13] Additionally, looking at the Napa River at Napa stream gauge, Higgins found "declining trends for 1960-2013 […] in minimum 30-day average [] and mean monthly stream flows for September-November []." Although the minimum 7-day average streamfows recorded at this stream gauge did not present a statistical trend, Higgins found that "7-day average flows have fallen to zero in 12 of 14 years since 2000…."[14]

The National Marine Fisheries Service (NMFS) made similar conclusions to Higgins and specifically highlighted the impacts of groundwater pumping in its comments on the 2016 Napa Valley Basin Analysis Report ("Napa Valley Basin Report"). The NMFS found that Napa River at St. Helena flow data "shows a general increase in zero-flow days over time" (*see* Figure 4-28 from the Napa Valley Basin Report, below).[15] Addressing the Napa River at Napa flow data,

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[9] Napa County Resource Conservation District, "Northern Napa Watershed Plan" (Report prepared for the California Department of Fish and Game) (Apr. 2002), at: http://naparcd.org/wp-content/uploads/2014/10/NorthernNapaRiverWatershedProjectFinalReport2002.pdf.

[10] Jonathan Koehler & Paul Blank, "Napa River Steelhead and Salmon Monitoring Program - 2015-16," Napa County Resource Conservation District, p. 8 (Sept. 2016), at: http://naparcd.org/wp-content/uploads/2016/09/2016-Napa-River-Fish-Monitoring-Report-and-Attachments.pdf.

[11] Stillwater Sciences and W.E. Dietrich, "Napa River Basin Limiting Factors Analysis. Technical Report," Prepared for the San Francisco Regional Water Quality Control Board and California State Coastal Conservancy (2002), at: http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/TMDLs/napasediment/lfa_tech_report.pdf; *see also* Napa County RCD, "Napa River Watershed Steelhead and Salmon Monitoring Program," at: http://naparcd.org/wp-content/uploads/2016/09/Fish-monitoring-fact-sheet-2016.pdf..

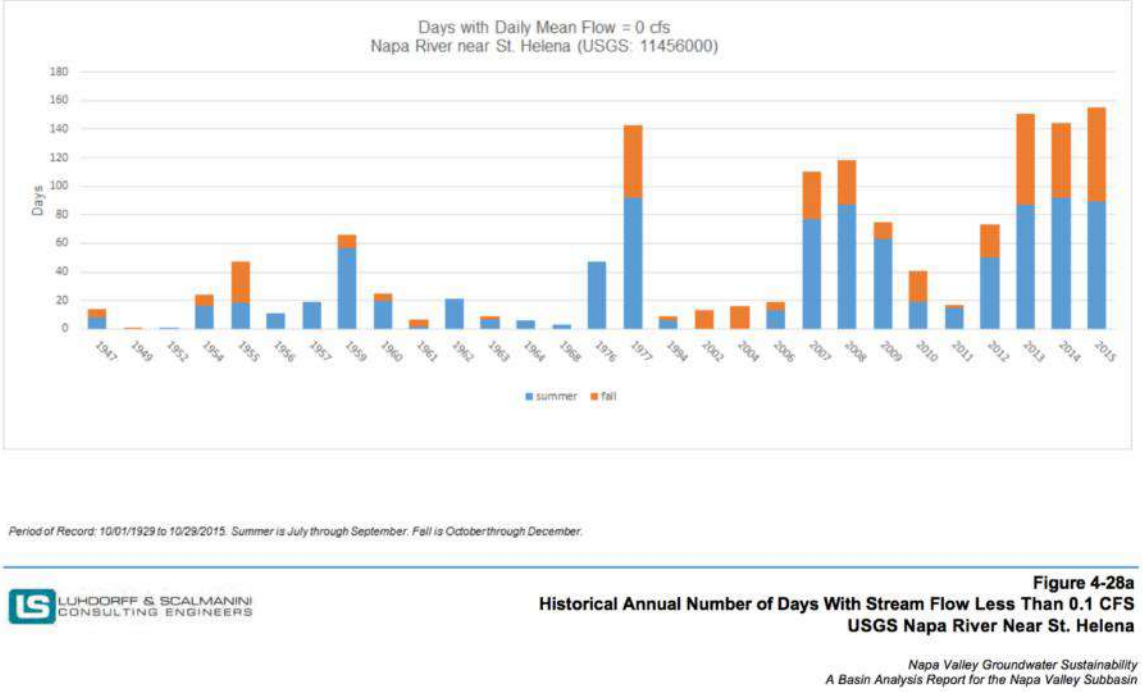
[12] Watershed Information & Conservation Council, "Native Fish," at: www.napawatersheds.org/app_pages/view/126.

[13] As noted by fisheries biologist Patrick Higgins, "Anderson (1969) chronicled problems with insufficient tailwater flows to support steelhead trout below [Napa Valley] dams, a condition that persists to this day." *See* letter from Patrick Higgins to San Francisco Bay Regional Water Quality Control Board, "Re: Proposal to Remove the Napa River and Sonoma Creek from the California Impaired Water Bodies (303d) List for Nutrient Pollution" (Jan. 10, 2014), at: www.waterboards.ca.gov/sanfranciscobay/board_info/agendas/2014/February/6C.pdf.

[14] *Id*.

[15] NMFS notes that "[s]ome of the increase may be due to the St. Helena gauge being relocated in 2005." *See* Letter from National Marine Fisheries Service (NMFS) to the California Department of Water Resources (DWR), Re: "Napa County's December 26, 2016 submission of an Alternative Groundwater Sustainability Plan (Napa Alternative Plan) to the DWR pursuant to the Sustainable Groundwater Management Act (SGMA) of 2014 and Subsequent Emergency Regulations," p. 3 (Feb. 15, 2017).

NMFS observed that "during the three decades before 1996, the Napa River at Napa rarely dried during the summer" despite this being a relatively dry period. Yet "since 2001, twelve of fifteen summers have experienced periods when the Napa River at Napa has dewatered, despite well above average precipitation trends during that period."[16] NMFS concluded that "[t]his information suggests worsening streamflow depletion over time that is, in part, related to groundwater extraction."[17]



Source: Luhdorff & Scalmanini, "Napa Valley Groundwater Sustainability: A Basin Analysis Report for the Napa Valley Subbasin," Figure 4-28a (Dec. 13, 2016).

Finally, photographic evidence underscores the clear impairment due to altered flows occurring regularly on the Napa River (non-tidal). Where a waterway – specifically, one that serves as crucial fish habitat for a federally-listed species such as steelhead trout – is completely dewatered due to human activities (particularly excessive groundwater pumping), a beneficial use impairment due to altered flows is beyond doubt.

[16] *Id.*
[17] *Id.*

Dry Napa River at Pope Street Bridge (2013), Napa County, California
Photo (unedited) by Mark Yashinsky (available at: http://bit.ly/2mBRET9)

Disconnected pools on the Napa River (2005)
Photo by Chris Malan

Dead Chinook salmon found in the Napa River near the Pope Street Bridge (2005)
Photo by Chris Malan

Conclusion: Available data demonstrates that flow alterations are impairing beneficial uses in the Napa River (non-tidal), particularly those beneficial uses related to aquatic life and habitat. This long history of flow impacts is well-documented by the USGS, U.S. Fish & Wildlife Service, Stillwater Sciences, and other government agency-conducted and -recognized studies. In accordance with Section 3.11 of the Listing Policy, when information indicates non-attainment of standards by a water body, the appropriate methodology for evaluation is weight of evidence to determine listing under Section 303(d).

This recommendation is consistent as well with Section 3.9 of the Listing Policy, which supports listing if the water body exhibits degradation in biological populations and pollutants sufficient to impair, or threaten impairment of, beneficial uses. The Napa River (non-tidal) has exhibited degradation in populations of fish (including federally-listed steelhead trout) that rely upon adequate flows for survival. Based on the readily available data and information, the evidence is sufficient to support the listing of the Napa River (non-tidal) on the 303(d) list for impairment caused by altered flow. This evidence also supports including the Napa River (non-tidal) in the 305(b) report.

DATA REFERENCES

- Jonathan Koehler & Paul Blank, "Napa River Steelhead and Salmon Monitoring Program - 2015-16," Napa County Resource Conservation District, p. 8 (Sept. 2016), at: http://naparcd.org/wp-content/uploads/2016/09/2016-Napa-River-Fish-Monitoring-Report-and-Attachments.pdf.

- K. R. Anderson, California Department of Fish and Game, "Steelhead Resource, Napa River Drainage, Napa County" (1969).

- Letter from National Marine Fisheries Service (NMFS) to the California Department of Water Resources (DWR), Re: "Napa County's December 26, 2016 Submission of an Alternative Groundwater Sustainability Plan (Napa Alternative Plan) to the DWR Pursuant to the Sustainable Groundwater Management Act (SGMA) of 2014 and Subsequent Emergency Regulations," p. 3 (Feb. 15, 2017).

- Letter from Patrick Higgins, Consulting Fisheries Biologist to Thomas Lippe, Living Rivers Council, "Sufficiency of SFBRWQCB Staff *Napa River Sediment TMDL Appendix D: Responses to Comments*" (Aug. 17, 2010).

- Letter from Patrick Higgins to San Francisco Bay Regional Water Quality Control Board, "Re: Proposal to Remove the Napa River and Sonoma Creek from the California Impaired Water Bodies (303d) List for Nutrient Pollution" (Jan. 10, 2014), at: www.waterboards.ca.gov/sanfranciscobay/board_info/agendas/2014/February/6C.pdf.

- Luhdorff & Scalmanini, "Napa Valley Groundwater Sustainability: A Basin Analysis Report for the Napa Valley Subbasin" (Dec. 13, 2016).

- Napa County Resource Conservation District, "Northern Napa Watershed Plan" (Report prepared for the California Department of Fish and Game) (Apr. 2002), at: http://naparcd.org/wp-content/uploads/2014/10/NorthernNapaRiverWatershedProjectFinalReport2002.pdf.

- Napa River Flow Enhancement Study, "Center for Ecosystem Management and Restoration" (2013), at www.cemar.org/pdf/2013-12-31%20Napa%20River%20Flow%20Enhancement%20Study.pdf.

- R.A. Leidy, G.S. Becker & B.N. Harvey, "Historical Distribution and Current Status of Steelhead/Rainbow Trout (Oncorhynchus Mykiss) in Streams of the San Francisco Estuary, California," Center for Ecosystem Management and Restoration (2005).

- Stillwater Sciences and W.E. Dietrich, "Napa River Basin Limiting Factors Analysis. Technical Report," Prepared for the San Francisco Regional Water Quality Control Board and California State Coastal Conservancy (2002), at: http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/TMDLs/napasediment/lfa_tech_report.pdf.

- U.S. Fish and Wildlife Service, "Analysis of Fish Habitat of the Napa River and Tributaries, Napa County, California, with Emphasis Given to Steelhead Trout Production" (1968).

- USGS Stream Gauge No. 11456000, NAPA R NR ST HELENA CA, available at: https://waterdata.usgs.gov/nwis/uv?site_no=11456000.

- USGS Stream Gauge No. 11458000 NAPA R NR NAPA CA, available at: https://waterdata.usgs.gov/nwis/uv?site_no=11458000.

9. Readily Available Data Exist and Have Been Provided in Support of the Listing of Waterways as Hydrologically Impaired

As evident based on substantial, readily available information, the lines of evidence for hydrologic impairment are strong for numerous Los Angeles Region waterway segments, including but not limited to Reach 3 of the Ventura River (specifically for "pumping," as currently listed) as well as the Santa Clara River (particularly Reaches 1 and 2).[39] Federal regulations state that states must evaluate "all existing and readily available information" in developing their 303(d) lists and prioritizations.[40] The SWRCB's Executive Director reinforced the breadth of this requirement in a memorandum on the scope of listing regulations at 40 CFR § 130.7(b)(5).[41] This information must include flow, a position recently reinforced by U.S. EPA, who stated that the integrated reporting format is key to "acknowledge the important role of flow in contributing to water-body impairments."[42]

Data Supporting Listing of the Ventura River (Reaches 3 and 4)

Excessive pumping contributes to the severe dewatering of the Ventura River (Reach 3), imperiling endangered steelhead trout and other aquatic species. Therefore, the Los Angeles RWQCB must not delist this waterway for "pumping" as is currently proposed.

As support, ELC incorporates by reference those comments prepared by Santa Barbara Channelkeeper on the Los Angeles Region's 2012 Integrated Report[43] and 2016 Integrated Report,[44] both of which summarize the extensive body of evidence establishing the link between pumping on Reach 3 (as well as Reach 4) of the Ventura River and resulting negative biological impacts, including to steelhead trout. ELC also incorporates by reference numerous additional documents that highlight the negative effects of excessive pumping on Reach 3 (as well as Reach 4) of the Ventura River, including from U.S. EPA Region 9 (finding in its Draft TMDL for Reaches 3 and 4 of the Ventura River that "low flows due to pumping and diversion activities likely exacerbate the flow and water quality conditions in Reaches 3 and 4"),[45] the National Marine Fisheries Service (NMFS) (finding in a 2007 Draft Biological Opinion that "[w]ater withdrawals from surface diversions and subsurface pumping have affected the timing and magnitude of the Ventura River flows ... and has decreased the quantity and quality of critical habitat for steelhead")[46], and the Los

[39] See Attachment 1 for detailed information drawn from such sources.
[40] 40 CFR § 130.7(b)(5).
[41] At: http://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/impaired_waters_list/clarification_30jan07.pdf (placing "no limits" on the data that can be provided to the RWQCBs for development of the Integrated Report's 303(d) and 305(b) lists).
[42] U.S. EPA/USGS Report, *supra*, Ch. 5.
[43] *See* Santa Barbara Channelkeeper, "Comment Letter—303(d) List portion of the 2012 California Integrated Report" (Feb. 5, 2015), available at: http://bit.ly/2o8pL5P.
[44] *See* letter from Santa Barbara Channelkeeper to the LA RWQCB on 2016 Revisions to the Los Angeles Region 303(d) List (Mar. 2017; available upon request).
[45] U.S. EPA Region 9, Ventura River Reaches 3 and 4 - Total Maximum Daily Loads For Pumping & Water Diversion-Related Water Quality Impairments (Draft Dec. 2012), at: https://www3.epa.gov/region9/water/tmdl/pdf/ventura-river-reaches3-4_tmdl.pdf.
[46] National Marine Fisheries Service, 2007 Draft Biological Opinion for the Army Corps of Engineers' permitting of the City of Ventura's proposed Foster Park Well Facility ("FPWF") repairs.

Padres National Forest Ojai Ranger District (describing the historic impacts low flows have upon steelhead trout populations in the Ventura River watershed in a report on steelhead restoration).[47]

Together, this data demonstrates that pumping impairs beneficial uses in Reach 3 of the Ventura River, particularly those beneficial uses related to aquatic life and habitat. In accordance with Section 3.11 of the Listing Policy, when information indicates non-attainment of standards by a water body, the appropriate methodology for evaluation is weight of evidence to determine listing under Section 303(d).

This recommendation is consistent as well with Section 3.9 of the Listing Policy, which supports listing if the water body exhibits degradation in biological populations and pollutants sufficient to impair, or threaten impairment of, beneficial uses. Reach 3 of the Ventura River has exhibited degradation in populations of fish (including steelhead trout) that rely upon adequate flows for survival.

Based on the readily available data and information, the evidence is sufficient to support the continued listing of Reach 3 of the Ventura River on the 303(d) list due to "pumping." Thus, the proposed delisting of the "pumping" impairment on Reach 3 must not proceed. The Los Angeles RWQCB staff has not provided sufficient information to justify this delisting, nor have they addressed the above evidence that clearly validates the "pumping" listing as it originally occurred. Similarly, this evidence supports the continued listing (as currently proposed) of Reach 3 as impaired due to "water diversion," and of Reach 4 as impaired due to both "water diversion" and "pumping."

Data Supporting Listing of the Santa Clara River

Since at least 2013, ELC and partners have submitted detailed information establishing a clear impairment due to altered flows on the Santa Clara River (in particular Reaches 1 and 2, located downstream of the Vern Freeman Diversion Dam). In May 2013, we submitted a "shortlist" of ten California waterways being drained dry for inclusion on the 303(d) list, along with supporting evidence (*see* Attachment 2). The Santa Clara River was one of those waterways. As described in the submitted evidence:

> The Santa Clara River is Southern California's last major free flowing waterway and is home to 17 species listed as threatened or endangered under the state and federal Endangered Species Acts. At River mile 10.5, United Water Conservation District (United) diverts almost all of the River's flows outside of large storm events. United, USGS, and local agency data show that water diverted at the Vern Freeman Diversion Dam for agricultural usage, groundwater recharge, and other uses, deprive migrating steelhead of sufficient flows and juvenile steelhead of healthy estuary rearing grounds.[48] In addition to impacting beneficial uses associated with the provision of adequate steelhead habitat, surface water withdrawals also destroy downstream native riparian and endangered bird

[47] Ventura Watershed Analysis - Focused for Steelhead Restoration, Los Padres National Forest Ojai Ranger District, Prepared by Sara Chubb (Forest Fishery Biologist) (1997), available at: http://friendsofventurariver.org/wp-content/themes/client-sites/venturariver/docs/ventura-river-watershed-steelhead-restoration-los-padres.pdf.

[48] Letter from Jason Weiner (Ventura Coastkeeper) to Jeffrey Shu (SWRCB), Public Solicitation of Water Quality Data and Information for 2012 Integrated Report (Aug. 30, 2010).

habitat, degrade the ecological integrity of the River's estuary, and impair a plethora of cultural and recreational beneficial uses downstream.[49]

Additional readily available information further supports the imperative to list the Santa Clara River as impaired due to altered flows. This includes documents published by NMFS (describing in a Final Biological Opinion the negative biological impacts of the Vern Freeman Diversion Dam, which can deplete the Santa Clara River of all its flows and jeopardizes the existence of endangered Southern California steelhead trout),[50] the Santa Clara River Trustee Council and The Nature Conservancy (describing Santa Clara River flow reductions caused by water diversions and groundwater pumping and the resulting impact on steelhead trout),[51] the Los Angeles RWQCB (describing the historic decline of steelhead trout in the Santa Clara River, as well as flow impacts from water diversions and hydromodification in its "State of the Watershed" report),[52] and others.

Severely reduced flows below the Vern Freeman Diversion Dam
Photo courtesy of Wishtoyo Chumash Foundation

Together, this data demonstrates that reduced flows impair beneficial uses in the Santa Clara River, particularly those beneficial uses related to aquatic life and habitat. This is most clearly true in Reaches 1 and 2 of the Santa Clara River, where over-diversion and other flow impacts (due in large part to the Vern Freeman Diversion Dam) can cause the waterway to go completely dry. In accordance with Section 3.11 of the Listing Policy, when information indicates non-attainment of standards by a water body, the appropriate methodology for evaluation is weight of evidence to determine listing under Section 303(d).

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[49] "Ten California Waterways Being Drained Dry - Using the Clean Water Act to Resuscitate Disappearing Waterways" (May 2013).

[50] National Marine Fisheries Service, Final Biological Opinion to Reclamation Re: Approve United Water Conservation District's Proposal to Operate the Vern Freeman Diversion and Fish Passage Facility (Jul. 23, 2008), at: http://www.westcoast.fisheries.noaa.gov/publications/recovery_planning/salmon_steelhead/domains/south_central_southern_california/nmfs_bo_vern_freeman___fish_passage_facility_7-23-08.pdf.

[51] Matt Stoecker and Elise Kelley, "Santa Clara River Steelhead Trout: Assessment and Recovery Opportunities" prepared for the Santa Clara River Trustee Council and The Nature Conservancy (Dec. 2005), at: http://www.stoeckerecological.com/reports/SantaClaraReport.pdf.

[52] Los Angeles Regional Water Quality Control Board, State of the Watershed - Report on Surface Water Quality: The Santa Clara River Watershed, p. 13 (Nov. 2006) at: www.waterboards.ca.gov/rwqcb4/water_issues/programs/stormwater/municipal/AdminRecordOrderNoR4_2012_0175/Section%2010_References-Part%20I_COMPLETED.pdf.

Region 8 - Santa Ana

FLOW-RELATED DECLINE OF THE SANTA ANA RIVER REACHES 3 & 4

Pollution: Altered Flow

Beneficial Uses Being Impaired: Warm Freshwater Habitat; Wildlife Habitat; Rare, Threatened or Endangered Species; Spawning, Reproduction, and Development; Contact and Non-Contact Water Recreation.

Description: Reaches of the Santa Ana River suffer from reduced flows due to human activities, negatively impacting a myriad of aquatic species. This includes populations of adult, juvenile, and larval Santa Ana sucker,[1] which are listed as "threatened" under the U.S. Endangered Species Act.[2]

One particular concern is that the frequent shutdown of the Rapid Infiltration and Extraction (RIX) wastewater treatment facility in Colton ("RIX facility")[3] causes severe dewatering of the Santa Ana River, including Reaches 3 and 4.[4] The Santa Ana sucker and other fish species rely upon treated wastewater discharges from the RIX facility and numerous smaller publically owned treatment works for their survival.[5] Treated wastewater provides nearly *all* of the water for the Santa Ana sucker in these reaches during dry summer months, and a substantial amount during other parts of the years.[6] Unfortunately, the wastewater flows provide nearly all of the Santa Ana River's flow due to long-term over-diversion and excessive groundwater pumping.

RIX facility shutdowns occur either as planned maintenance or for unplanned emergencies. During planned shut downs the beneficial uses are clearly impaired, as large numbers of Santa Ana suckers are netted and placed into buckets until flows return. However, the majority of RIX facility shutdowns occur on an emergency basis, largely due to emergency maintenance of water-purifying ultraviolet lights. While there are only two or so planned shutdowns per year, emergency shutdowns occur about twice per *month* – some of them lasting as long as three

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[1] San Bernardino Valley Municipal Water District, Board of Directors' Workshop, Re: "Funding to Equip Three Existing Wells for Use a Backup Water Supply for Santa Ana Sucker During RIX Shutdowns" (May 10, 2016), at: http://laserfiche.sbvmwd.com/weblink/0/edoc/322256/SBVMWD%20Board%20of%20Directors%20Workshop%20051016.pdf.

[2] *See* "Santa Ana Sucker (Catostomus Santaanae)," U.S. Fish & Wildlife Service, at: https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=E07W.

[3] The RIX facility is a publicly owned treatment works operated by the City of San Bernardino Municipal Water Department.

[4] The RIX facility discharges wastewater into Reach 4 of the Santa Ana River, which then flows into Reach 3. Reach 4 spans from Bunker Hill Dike to the Mission Boulevard Bridge in Riverside, while Reach 3 spans from Mission Boulevard Bridge to the Prado Dam. *See* Upper Santa Ana River Watershed Integrated Regional Water Management Plan, p. 2-25 (2015), at: http://www.sbvwcd.org/docman-projects/upper-santa-ana-integrated-regional-water-management-plan/3802-usarw-irwmp-2015-ch1-9-final/file.html.

[5] As stated in a report by the U.S. Fish & Wildlife Service, the "Santa Ana sucker is dependent on discharges from the RIX facility to maintain suitable habitat for spawning and foraging." *See* "Santa Ana Sucker: 5 Year Review - Summary and Evaluation," U.S. Fish and Wildlife Service, p. 23 (March 10, 2011), at: https://www.fws.gov/carlsbad/SpeciesStatusList/5YR/20110310_5YR_SASU.pdf.

[6] *Id.* (*citing* California Regional Water Quality Control Board, Water Quality Control Plan, Santa Ana River Basin (8) (2008), p. 1-11; "Susceptibility of the Santa Ana Sucker (Catostomus Santaanae) to Endocrine Disrupting Compounds, Wastewater Compounds, and Other Contaminants," U.S. Fish and Wildlife Service, pp. 2-3 (2008)).

hours, and with no advance notice.[7] Emergency shutdowns of more than an hour can cause the Santa Ana River to dry up completely, and no buckets are provided given that the emergency shutdowns occur without notice.

Flow disruptions caused by the RIX facility have a significantly negative impact on the Santa Ana sucker and other fish species. A September 2015 USGS Native Fish Survey found that about 90 percent of the Santa Ana sucker population inhabits the reach that goes dry when the RIX facility shuts down – an "unsustainable situation that is negatively affecting the stability, resiliency, and abundance of the sucker population in the Santa Ana River," according to a memorandum written by San Bernardino Valley Municipal Water District staff.[8] These shutdowns have already killed hundreds of Santa Ana sucker.[9] During one such shutdown in 2014, a USGS member reported a "a pulse of dead fish floating down river."[10] These impacts have been exacerbated by the ongoing drought, which has reduced groundwater supplies that feed the Santa Ana River.[11]

Additional data demonstrates altered flow impacts on Reaches 3 and 4 of the Santa Ana River beyond RIX facility impacts. As stated by the U.S. Fish & Wildlife Service, "[t]he primary threat to Santa Ana sucker is ongoing, rangewide hydrological modifications which lead to degradation and loss of habitat."[12] Such hydromodification may include "flood control dams, drop structures, recreational dams, road crossings (for example, culverts) and levees," which together have been found to limit Santa Ana sucker dispersal and connectivity.[13] In regards to diversions in the Santa Ana River watershed, the U.S. Fish & Wildlife Service also found that the "magnitude of usage in all of the watersheds is high" and "[t]he removal of water from the system inevitably limits the quantity of habitat that is accessible and suitable for Santa Ana suckers."[14]

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[7] *See* memorandum from Heather Dyer, Water Resources Project Manager at the San Bernardino Valley Municipal Water District, to the Board of Directors, "Funding to Equip Three Existing Wells for Use a Backup Water Supply for Santa Ana Sucker During RIX Shutdowns" (May 10, 2016), available at: http://laserfiche.sbvmwd.com/weblink/0/edoc/322256/SBVMWD%20Board%20of%20Directors%20Workshop%20051016.pdf.

[8] *Id*. (*citing* September 2015 USGS Native Fish Survey).

[9] *See e.g.,* Jim Steinburg, "Drought, Water Department Delays Threaten Endangered Santa Ana Sucker Fish," THE SUN (May 10, 2016), at: http://www.sbsun.com/environment-and-nature/20160516/drought-water-department-delays-threaten-endangered-santa-ana-sucker-fish. A lawsuit filed by three conservation groups cites over 100 deaths of Santa Ana sucker since 2014 arising from only three instances where the RIX facility was shut down and the river went dry. *See* Center for Biological Diversity, Press Release, "Lawsuit Launched Over California Cities' Killing of Threatened Santa Ana Suckers: Colton, San Bernardino Halted Water Releases Imperiling Rare Fish" (Aug. 22, 2016), at: https://www.biologicaldiversity.org/news/press_releases/2016/santa-ana-sucker-08-22-2016.html.

[10] *Id.*

[11] *See e.g.,* Jim Steinburg, "Drought, Water Department Delays Threaten Endangered Santa Ana Sucker Fish," THE SUN (May10, 2016), at: http://www.sbsun.com/environment-and-nature/20160516/drought-water-department-delays-threaten-endangered-santa-ana-sucker-fish; *see also* Santa Ana Regional Water Quality Control Board, Re: "Colton/San Bernardino Regional Tertiary Treatment Rapid Infiltration and Extraction Facility: Update on Operational Impacts to Santa Ana Sucker," (Dec. 16, 2016), at: www.waterboards.ca.gov/santaana/board_info/agendas/2016/12_16/Item_11.pdf.

[12] *Id.* at p. iii (2014).

[13] U.S. Fish & Wildlife Service (Region 8), "Draft Recovery Plan for the Santa Ana Sucker," p. I-11 (2014).

[14] "Santa Ana Sucker: 5 Year Review - Summary and Evaluation," U.S. Fish and Wildlife Service (March 10, 2011), at: https://www.fws.gov/carlsbad/SpeciesStatusList/5YR/20110310_5YR_SASU.pdf.

USGS data also highlights altered flows in the Santa Ana River. For example, the USGS "Water-Data Report" for 2013 for the Santa Ana River below Prado Dam, CA (Site #11074000; located just beyond Reach 3 of the Santa Ana River) states that "[n]atural streamflow [is] affected by extensive ground-water withdrawals, diversion for irrigation, discharges of treated effluent, and return flow from irrigated areas."[15] The report finds that for the water year 2013 (the most recent year for which this report is available), the annual mean discharge was 138 cubic feet per second (cfs), as compared to an average of 224 cfs for water years 1941-2013.[16] Since then, the annual mean discharge has remained low – 119.5 cfs for water year 2014, 148.6 cfs for water year 2015, and 158.4 cfs for water year 2016.[17] Additional data on flows is readily available through the USGS Water-Data Reports and online flow gauge data.[18]

Finally, photographic evidence underscores the clear impairment due to altered flows occurring regularly on the Santa Ana River. Where a waterway – specifically, one that serves as crucial fish habitat for a federally-listed species such as the Santa Ana sucker – is completely dewatered due to human activities (the management of a wastewater facility in addition to over-diversion and other activities), a beneficial use impairment due to altered flows is beyond doubt.

Dewatered Santa Ana River
Photo by Heather Dyer, San Bernardino Valley Municipal Water District

[15] Water-Data Report 2013, " 11074000 Santa Ana River Below Prado Dam, CA," Santa Ana River Basin, USGS, at: https://wdr.water.usgs.gov/wy2013/pdfs/11074000.2013.pdf.
[16] *Id.*
[17] "USGS Surface-Water Annual Statistics for the Nation," USGS 11078000 SANTA ANA R A SANTA ANA CA, at: https://waterdata.usgs.gov/nwis/annual?referred_module=sw&site_no=11078000&por_11078000_8225=2207798,00060,8225,1923,2017&year_type=W&format=html_table&date_format=YYYY-MM-DD&rdb_compression=file&submitted_form=parameter_selection_list.
[18] *See e.g.,* Water-Data Report 2013, "11059300 Santa Ana River at E Street, near San Bernardino, CA," Santa Ana River Basin, USGS, at: https://wdr.water.usgs.gov/wy2013/pdfs/11059300.2013.pdf; Water-Data Report 2013, "11066460 Santa Ana River at Metropolitan Water District Crossing, near Arlington, CA," Santa Ana River Basin, USGS, at: https://wdr.water.usgs.gov/wy2013/pdfs/11066460.2013.pdf; Water-Data Report 2013, "11078000 Santa Ana River at Santa Ana, CA," Santa Ana River Basin, USGS, at: https://wdr.water.usgs.gov/wy2013/pdfs/11078000.2013.pdf.

Conclusion: Available data demonstrates that flow alterations are impairing the beneficial uses of Reaches 3 and 4 of the Santa Ana River, particularly those beneficial uses related to aquatic life and habitat. This long history of flow impacts is well-documented by the USGS, U.S. Fish & Wildlife Service, San Bernardino Valley Municipal Water District, and other government agency-conducted and -recognized studies. In accordance with Section 3.11 of the Listing Policy, when information indicates non-attainment of standards by a water body, the appropriate methodology for evaluation is weight of evidence to determine listing under Section 303(d).

This recommendation is consistent as well with Section 3.9 of the Listing Policy, which supports listing if the water body exhibits degradation in biological populations and pollutants sufficient to impair, or threaten impairment of, beneficial uses. Reaches 3 and 4 of the Santa Ana River have exhibited degradation in populations of fish (including the threatened Santa Ana sucker) that rely upon adequate flows for survival. Based on the readily available data and information, the evidence is sufficient to support the listing of Reaches 3 and 4 of the Santa Ana River on the 303(d) list for impairment caused by altered flow. This evidence also supports including Reaches 3 and 4 of the Santa Ana River on the 305(b) report.

DATA REFERENCES

- Upper Santa Ana River Watershed Integrated Regional Water Management Plan (2015), at: www.sbvmwd.com/Home/ShowDocument?id=1468.

- "Draft Recovery Plan for the Santa Ana Sucker," U.S. Fish & Wildlife Service (2014), at: https://www.fws.gov/carlsbad/SpeciesStatusList/RP/201411xx_Draft%20RP_SASU.pdf.

- "Habitat Variability and Distribution of the Santa Ana Sucker, Catostomus Santaanae, in the Santa Ana River from the Confluence of the Rialto Channel to the Prado Basin," Santa Ana Watershed Project Authority (on behalf of Santa Ana Sucker Conservation Team) (Sept. 16, 2014), at: www.sawpa.org/wp-content/uploads/2012/05/SASucker-Survey_9-16-14.pdf.

- "Santa Ana Sucker: 5 Year Review - Summary and Evaluation," U.S. Fish and Wildlife Service, Carlsbad Fish & Wildlife Office (March 10, 2011), at: https://www.fws.gov/carlsbad/SpeciesStatusList/5YR/20110310_5YR_SASU.pdf.

- "Habitat Variability and Distribution of the Santa Ana Sucker, Catostomus Santaanae, in the Santa Ana River from the Confluence of the Rialto Channel to the Prado Basin," Santa Ana Sucker Conservation Team (Sept. 16, 2014), at: http://www.sawpa.org/wp-content/uploads/2012/05/SASucker-Survey_9-16-14.pdf.

- Sediment Dynamics Affecting the Threatened Santa Ana Sucker in the Highly-Modified Santa Ana River and Inset Channel, Southern California, USA," by J.T. Minear; S.A. Wright (USGS Central Region Office & U.S. Geological Survey) (2015), at: www.adsabs.harvard.edu/abs/2015AGUFMEP33A1050M.

- Santa Ana River Watermaster Annual Reports, available at: www.wmwd.com/292/Santa-Ana-Watermaster-Reports.

- Western-San Bernardino Watermaster Annual Reports, available at: www.wmwd.com/294/Western-San-Bernardino-Annual-Reports

- USGS Water-Data Reports
    - Water-Data Report 2013, "11059300 Santa Ana River at E Street, near San Bernardino, CA," Santa Ana River Basin, USGS, at: https://wdr.water.usgs.gov/wy2013/pdfs/11059300.2013.pdf.
    - Water-Data Report 2013, "11066460 Santa Ana River at Metropolitan Water District Crossing, near Arlington, CA," Santa Ana River Basin, USGS, at: https://wdr.water.usgs.gov/wy2013/pdfs/11066460.2013.pdf.
    - Water-Data Report 2013, " 11074000 Santa Ana River below Prado Dam, CA," Santa Ana River Basin, USGS, at: https://wdr.water.usgs.gov/wy2013/pdfs/11074000.2013.pdf.
    - Water-Data Report 2013, "11078000 Santa Ana River at Santa Ana, CA," Santa Ana River Basin, USGS, at: https://wdr.water.usgs.gov/wy2013/pdfs/11078000.2013.pdf.

- "USGS Surface-Water Data for the Nation," USGS, available at: https://waterdata.usgs.gov/nwis/sw.

ATTACHMENT B

Comment Letter from ELC to San Diego RWQCB, "Comment – CWA Section 305(b)/303(d) Integrated Report" (Aug. 8, 2016)

earth LAW CENTER
FIGHTING FOR NATURE'S RIGHTS

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August 8, 2016

Henry Abarbanel, Chair and Board Members
San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100
San Diego, California 92108

VIA ELECTRONIC SUBMITTAL: sandiego@waterboards.ca.gov

Re: Comment – CWA Section 305(b)/303(d) Integrated Report, Attn: Xueyuan Yu

Dear Chair Abarbanel and Board Members:

On behalf of Earth Law Center (ELC), I welcome the opportunity to submit these comments on the above-referenced CWA Section 305(b)/303(d) Integrated Report (Report). ELC has been working at the state and national levels for a number of years to ensure that waterbodies impaired by "pollution," particularly altered flow and hydrology, are represented in either Category 5 or Category 4C of the 305(b)/303(d) Integrated Report. Our recent comment letter to U.S. EPA and USGS in support of such listings is attached.

We write today in support of your proposal to list waterways as impaired due to hydromodification and habitat alteration in Category 4C, as discussed in the July 2016 Draft Staff Report[1] at pages 12-17. As noted in the Staff Report, on August 13, 2015 U.S. EPA released guidance on Integrated Reporting and Listing Decisions that reaffirmed the duty to list in Category 4C those waters impaired by "pollution."[2] In this guidance, U.S. EPA notes that "[w]hile TMDLs are not required for waterbody impairments assigned to Category 4C, States can employ a variety of watershed restoration tools and approaches to address the source(s) of the impairment," raising the importance of full and complete listing identification for these impaired waterways. The Staff Report echoes EPA's finding, stating that Category 4C listed waters "may be a priority for restoration by a Regional Water Board."

We further support your staff's work, consistent with U.S. EPA guidance and regulations, to identify flow-impaired stream segments where in-stream data was lacking, using such tools as

[1] At: http://www.waterboards.ca.gov/sandiego/water_issues/programs/303d_list/docs/IR_RB_StaffReport_R9_07-11-16_Clean.pdf.

[2] Memorandum from U.S. EPA, Office of Wetlands, Oceans, and Watersheds Information to Water Division Directors, Regions 1 – 10, Concerning 2016 Clean Water Act Sections 303(d), 305(b), and 314 Integrated Reporting and Listing Decisions (August 13, 2015), at: https://www.epa.gov/sites/production/files/2015-10/documents/2016-ir-memo-and-cover-memo-8_13_2015.pdf. *See also* U.S. EPA, "Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act," p. 56 (July 29, 2005), at: http://bit.ly/2aIVP8h.

"desktop aerial reconnaissance for potential in-stream habitat and hydrologic alteration associated with channel modifications, stream diversion or augmentation."

Finally, we support staff's assertion that it is "important to note that USEPA recommended in its 2015 guidance that 'States assign all of their surface water segments to *one or more* of five reporting categories'." (Emphasis added.) In other words, a stream segment can be listed for *both* impaired hydrology and pollutant contamination, rather than one or the other.

Specific listing of all waters impaired by "pollution" gives a far more accurate picture of the challenges facing state agencies and Californians than ignoring pollution impairments. For example, the Staff Report states that "over 96 percent of streams that exhibited biological degradation had both an associated pollutant(s) and supporting information showing pollution from in-stream habitat/hydrologic alteration and/or watershed hydrologic alteration (hydromodification, Table 3)." If pollution impairments were ignored, then virtually all of the impaired streams in the San Diego Region would be under-assessed, likely resulting in misallocation of limited resources and attention.

The Clean Water Act calls on the nation to protect the chemical, biological *and physical* integrity of our waters. The full and proper identification of all impaired waterways, including for altered flow and hydrology, is an important step in meeting this mandate. We urge the San Diego Regional Water Quality Control Board to adopt the proposed listings for habitat alteration/hydromodification, as described in Table 3 of the Draft Staff Report and elsewhere. Thank you for the opportunity to submit these comments.

Sincerely,

Linda Sheehan
Executive Director
lsheehan@earthlaw.org

attachments

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June 14, 2016

Diana Eignor
Health and Ecological Criteria Division
Office of Water (Mail Code 4304T)
Environmental Protection Agency
1200 Pennsylvania Avenue NW
Washington, DC 20460

VIA ELECTRONIC SUBMITTAL: Federal eRulemaking Portal: http://www.regulations.gov

Re: Draft EPA-USGS Technical Report: Protecting Aquatic Life from Effects of Hydrologic Alteration; 81 FR 21863; Docket ID No. EPA-HQ-OW-2015-0335

Dear Ms. Eignor:

On behalf of Earth Law Center (ELC), I welcome the opportunity to submit these comments on the above-referenced Report. We thank U.S. EPA and USGS for taking up the critical task of protecting aquatic life from the increasing pressures of over-extraction of our waterways. In California, several aquatic species, including the Delta smelt and winter-run Chinook salmon, are at risk of imminent extinction due to unwise water use and planning. Reports such as this one are essential to better prepare for the challenges we face now and those to be expected in the future, particularly due to climate change.

We agree with the comments of the Natural Resources Defense Council that: (a) the Report is scientifically sound and provides a clear framework by which decisionmakers can effectively employ flow regime management strategies to protect aquatic ecosystems and species, and (b) U.S. EPA and USGS should finalize the Report this year and conduct immediate outreach to ensure swift implementation.

Further, we particularly support the discussion in Chapter 5 with regard to state and federal actions in law and policy to protect instream flows. We agree with the finding by U.S. EPA Region 4 (see attached letter, pages 9-13) that instream flow criteria adopted into water quality standards "would be in use for all purposes under the CWA…such as Section 401, Section 404, etc." Accordingly, we support the following areas of discussion and recommendation in Chapter 5 the Report, as well as the associated Appendix B:

- Section 5.1, calling for adoption of flow criteria in Water Quality Standards. The attached U.S. EPA Region 4 letter describes the numerous benefits of such CWA-compliant "instream flow water quality standards" in more detail. We request that U.S. EPA take a leadership role in engaging states to adopt and implement such standards.

- Section 5.2, concluding that water bodies impaired by altered flow must be identified as impaired under Category 4C of the 303(d)/305(b) Integrated Report. Earth Law Center has done extensive analysis into the fact that such flow listings are requirement rather than a suggestion, and are essential for both state and local planning purposes. We are happy to provide these analyses on request. We strongly urge U.S. EPA to reject any 303(d)/305(b) reporting that does not include appropriate Category 4C listings for impairments associated with altered flow.
- Section 5.4, requiring consideration of flow in Section 401 certifications. For example, California is facing a Section 401 certification process with regard to the development of its "Twin Tunnels" project, which would reduce the amount of flow to the already-struggling Delta. It is unclear at this point whether the state will appropriately consider flow in this process. Clear instruction from U.S. EPA with regard to the applicability of flow to Section 401 certifications is essential if we are to invest in infrastructure that will serve people and environment well in the long term.
- Other applications of the CWA and related processes to flow, as discussed elsewhere in Chapter 5. These applications include, but are not limited to, Section 402 and 404 permits. Such recommendations are echoed and expanded upon in a letter by U.S. EPA Region 1 (attached), which was issued shortly after the landmark U.S. Supreme Court decision *PUD v. Washington Dep't of Ecology*. This decision, of course, found the distinction between water quality and flows to be an "artificial" one.

The Clean Water Act calls on the nation to protect the chemical, biological and physical integrity of our waters. The Report is an essential step in fulfilling all three elements of this mandate. We urge U.S. EPA to swiftly adopt the Report and begin work with the states to implement its recommendations, particularly those in Chapter 5.

Thank you for the opportunity to submit these comments.

Sincerely,

Linda Sheehan
Executive Director
lsheehan@earthlaw.org

attachments

Additional Attachments Omitted

Attachment C

Public Documents Re: 303(d)/305(b) Listings Due to Altered Flows and Supporting Scientific Evidence

***Attached as separate file**
See email attachment

High resolution version available at:
http://bit.ly/2u0cQFG

ATTACHMENT D

Ten Sample States Listing Waterways as Impaired Due to Causes Related to Altered Flows

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Clean Water Act Section 303(d) and 305(b) Listings of Impaired Waters: Ten Examples

SUMMARY

This document provides excerpts from Clean Water Act Section 303(d) and 305(b) reports for ten sample states listing waterways as impaired due to causes related to altered flows.[1] These states, and others that identify waterways as impaired by flow-related alterations, recognize the importance of accurately reflecting waterway health status as required by Section 303(d)(1)(A).[2]

A summary of the attached excerpts is provided below, with "prior appropriation" water law states in **bold**. Note that "Category 4C" (also "4c") refers to a US EPA-created category of water segments impaired by "pollution" (*e.g.*, flows) as opposed to "pollutants" (*e.g.*, chemical constituents). "Category 5," which refers to impairments due to "pollutants" that need TMDLs, is typically, though not always, used synonymously with the Section 303(d) list. As addressed below and illustrated in the pages to follow, state approaches to listing flow alterations as a "cause" (rather than merely a "source") of impairment can vary as follows:

- Flow on 303(d) list on its own merit: list flow impairments as part of the state's Section 303(d) list solely on the merit of a waterway's 4C identification as a cause of impairment; that is, whether alone *or* in combination with a pollutant impairment (Tennessee)[3];
- Flow on 303(d) list *if* there is also an impairing pollutant present: list flow impairments as a cause of impairment on the "303(d) list" (Ohio) or on the "Category 5/303(d)" list (New

[1] Other states with flow-related listings include but are not necessarily limited to: Maryland, Nebraska, New York and Washington D.C. (D.C. lists flow impairments on its 303(d) list of impaired waters rather than the 305(b) list).

[2] Section 303(d)(1)(A): "Each state shall identify those waters within its boundaries for which the effluent limitations … are not stringent enough to implement any water quality standard applicable to such waters. The State shall establish a priority ranking for such waters, taking into account the severity of the *pollution* and the uses to be made of such waters." (Emphasis added.) Note that Section 303(d)(1)(A) refers to "pollution," calling into question the assumption that the list excludes impairments due to flow, also labeled "pollution." By contrast, Section 303(d)(1)(C) focuses on determining whether or not TMDLs are required to address pollutant-related impairments ("Each State shall establish for the waters identified in paragraph [303(d)](l)(A)] of this subsection, and in accordance with the priority ranking, the total maximum daily load, for those pollutants which the Administrator identifies … as suitable for such calculation….). Accordingly, the states identified in this document at a minimum recognize that they must identify *all* impaired water bodies comprehensively, and that the identification of impairments for TMDL purposes is a separate task. Tennessee (and Washington D.C.) also appropriately recognize that flow impairments should be on the "Section 303(d)" list, as per Section 303(d)(1)(A). For more information on the requirements under federal Clean Water Act Section 303(d) to list impaired waters and the utility of such required listings, *see, e.g.,* Comment Letter from Earth Law Center *et al.* to North Coast RWQCB, "2012 Integrated Report for the Clean Water Act Section 305(b) Surface Water Quality Assessment and the 303(d) List of Impaired Waters: (Aug. 8, 2014) (ELC *et al.* Letter); at: http://earthlawcenter.org/static/uploads/documents/303d_Ltr_NorCal_Flows_Res_and_Staff_Rpt.pdf.

[3] As noted above, Washington D.C. also lists flow-impaired waters on its Section 303(d) list.

Mexico, Michigan) *if* there is also a pollutant impairing the waterway in addition to the flow impairments;

- Flow on 305(b) list: list flow impairments as a cause of impairment, but on the 305(b) rather than the 303(d) list; that is, characterizing both Category 4C and 5 waters as causing beneficial use impairment but distinguishing the 303(d) list for purposes of drafting TMDLs, rather than distinguishing impairment (Idaho, Montana, Vermont, Washington, Wyoming).

Note again that, unlike California (the Los Angeles Region listings excepted), each of these states (including "prior appropriation" water law states) clearly list flow-related alterations as a cause of impairment. The permutations arise from the fact that the states (except Tennessee) reconcile in different ways the language of Section 303(d)(1)(A) versus US EPA guidance setting out categories for the listing process.

As illustrated below, states are using this flow impairment information already, including with respect to setting state priorities for action. For example, Montana and Ohio use their 4C flow impairment data in compiling statistics on statewide sources of impairment, which provides more accurate information on threats to waterway health than in states that fail to include this important information. Vermont compiles the flow impairment information with the status of efforts to address it, as well as a "Projected WQS Compliance Year" for the affected waterways.

Further summary information is provided below, with excerpts from states' reports following. We urge California to follow the lead of these states and identify flow impairments on its Section 303(d) list of impaired waterways. Taking action now on those waters most clearly flow impaired is essential, especially given the fact that we are witnessing biennial reports every six years now instead of every two.

I. **California –** The 2006 California 303(d) list includes Category 5 listings for "water diversion" and "hydromodification" in the Los Angeles region.[4]

II. **Idaho –** Appendix I of the latest Idaho Integrated Report states that "[i]mpaired water bodies are placed in Category 4c if the impairment is not caused by a *pollutant* but rather caused by *pollution*," and contains 36 pages (7,342 river/stream miles) of Category 4c-impaired waters, including numerous waterways listed as impaired due to the cause of "low flow alterations."[5] Appendix J consists of Category 5 waterways, interpreted as a "streamlined" [6] 303(d) list that focuses on the need for TMDLs rather than overall impairments.

III. Michigan – Appendix B, the "Comprehensive List of Assessment Unit Designated Use Support," contains all information on assessment units and is split (for size reasons) into

[4] http://www.waterboards.ca.gov/water_issues/programs/tmdl/docs/303dlists2006/epa/r4_06_303d_reqtmdls.pdf.
[5] https://www.deq.idaho.gov/media/1117323/integrated-report-2012-final-entire.pdf.
[6] *Id.,* p. 35.

Appendices B1 and B2.[7] "Other flow regime alteration" is listed as a cause of impairment for both Category 4c- and Category 5-identified assessment units in Appendix B. Category 4c is defined as water bodies impaired only by pollution, such as low flows. Appendix C, which Michigan interprets to be its 303(d) list, consists of Category 5 assessment units, but does include assessment units that list "other flow regime alterations" as a cause of impairment, where the flow alteration is an impairment cause along with a pollutant cause (*e.g.*, sedimentation/siltation).[8]

IV. **Montana** – Appendix A ("Impaired Waters") of the Integrated Report lists *all* impaired waters in the state, including Category 4c ("waterbodies impaired only by non-pollutant causes") and Category 5 waters; it specifically includes "low flow alterations" and "other flow regime alterations" as causes (not sources) of impairment.[9] Appendix B lists "Waters in need of TMDLs [303(d) list] and TMDL Priority Schedule"; this includes only pollutants, as the focus of the table is on TMDLs.[10] Montana also uses flow impairment data elsewhere; for example, "Low flow alterations" is listed as third in the "Top 10 Causes of Impairment" for all assessment units (AUs) in Montana, with 237 AUs impaired for low flow alteration.[11] This statistic illustrates the utility of collecting flow impairment data in identifying the correct priorities for state action to improve waterway health.

V. **New Mexico** – The "List of Assessed Surface Waters" (Appendix A) identifies impaired waters for every assessment unit as organized by watershed, which includes Category 4c and Category 5 listings. Both Categories include "low flow alterations" as an impairment cause. Flow impairments are included in Category 5 listings as well, and thus on the 303(d) list (*e.g.*, Rito Leche, Rio Bonito), but only where a pollutant is also identified as a cause.[12]

VI. Ohio – Combines Category 4C-listed waters (including those impaired due to "other flow regime alterations") with Category 5 and other categories in single charts, though the text identifies Category 5 as the 303(d) list.[13] Like Montana, Ohio also provides statewide summaries of impairments by cause; for example, "hydromodification" is identified as one of the "top five causes of impairment" for 36% of monitored assessment units with aquatic life impairment (nutrients is first for watershed assessment units).[14] Again, this illustrates

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[7] http://www.michigan.gov/documents/deq/wrd-swas-2012IR-appB1_370329_7.pdf (Appendix B1). http://www.michigan.gov/documents/deq/wrd-swas-2012IR-appB2_370330_7.pdf (Appendix B2).

[8] http://www.michigan.gov/documents/deq/wrd-swas-2012IR-appCdetail_370331_7.pdf ("Appendix C - Assessment units not supporting designated uses (*i.e.* assessment units placed in Category 5")).

[9] http://deq.mt.gov/WQInfo/CWAIC/Reports/IRs/2012/Appendix_A.pdf (2012); http://deq.mt.gov/WQInfo/CWAIC/Reports/IRs/2014/Appendix_A.pdf (draft 2014).

[10] http://deq.mt.gov/WQInfo/CWAIC/Reports/IRs/2012/Appendix_B.pdf.

[11] http://deq.mt.gov/WQInfo/CWAIC/Reports/IRs/2012/Final2012IR.pdf (Table 4-6).

[12] http://www.nmenv.state.nm.us/swqb/303d-305b/2012-2014/AppendixA-USEPA-Approved303dList.pdf.

[13] http://www.epa.ohio.gov/portals/35/tmdl/2012IntReport/IR12SectionL4final.pdf; *see also* http://wwwapp.epa.ohio.gov/gis/mapportal/IR2012.html (the 2014 Integrated Report Map Portal that lists details on the source of 4C impairments, which includes "other flow regime alterations") and www.epa.ohio.gov/portals/35/tmdl/2012IntReport/IR12SectionAfinal.pdf (providing details on flow alteration as a major cause and source of water quality problems).

[14] http://www.epa.ohio.gov/portals/35/tmdl/2012IntReport/IR12SectionGfinal.pdf.

the utility and importance of identifying impairment causes properly, rather than neglecting to list entire categories of impairment causes and potentially identifying state priorities based on inaccurate data.

VII. Tennessee – Definitively and deliberately includes numerous flow-impaired waterways on its 303(d) (*i.e*., not 305(b)) list), regardless of whether an impairing "pollutant" is also present.[15] Greg Denton at the Division of Water Resources (Gregory.Denton@tn.gov, 615-532-0699) says the state includes flow impairments on the 303(d) list because "[t]he list is supposed to be inclusive of everything we have data to justify." He adds that the public uses the 303(d) list a "quick reference guide as to what is impaired and what is not," which also calls for full listings of all impairment causes. Category 5 identification can still clearly indicate the need for TMDLs, but having all impaired waters in one 303(d) list serves the public interest and the Clean Water Act.

VIII. Vermont – Lists "Impaired Surface Waters in need of TMDL" in Part A, which they identify as their Section 303(d) list.[16] For its Category 4c listings, Vermont lists "Surface Waters Altered by Flow Regulation" in Part F, which includes nine pages of waterways with aquatic habitat or other designated uses for which "one or more designated uses are not supported" due to flow alteration.[17] Vermont identifies the Part F waters as "priority waters for management action," lists management actions to be taken for each where available, and also identifies the "Projected WQS Compliance Year" for each of these flow-impaired waterways.

IX. **Washington** – Lists numerous waterways as impaired due to altered flow under Category 4C[18] in the "303(d)/305(b) Integrated Report" (*e.g*., there are 55 results when searching within "2012 Category: 4C" for "instream flow").[19] Washington currently recognizes Category 5 as comprising the 303(d) List, with no flow listings in Category 5/303(d). However, the Report notes in the Section 4C portion of the Integrated Report that flow listings had been on the state's earlier Section 303(d) lists (*e.g*., on the 1998 List) but were moved off the 303(d) list to 305(b) specifically as a result of new US EPA Guidance.[20] In other words, the movement from the 303(d) list was based on a new reporting convention rather than a state legal or factual finding under the Clean Water Act. A quick search of all

[15] http://www.tn.gov/environment/water/docs/wpc/2012-final-303d-list.pdf.
[16] http://www.vtwaterquality.org/mapp/docs/mp_2012_303d_Final.pdf.
[17] http://www.watershedmanagement.vt.gov/mapp/docs/mp_2012_priority_waters_lists.pdf (2012); http://www.watershedmanagement.vt.gov/mapp/docs/mapp_Part_F_2014_draft_complete.pdf (draft 2014).
[18] *See* http://www.ecy.wa.gov/programs/wq/303d/WQAssessmentCats.html.
[19] http://www.ecy.wa.gov/programs/wq/303d/currentassessmt.html. *See, e.g.,* one such listing at: http://apps.ecy.wa.gov/wats/ViewListing.aspx?LISTING_ID=6212.
[20] *See, e.g.,* http://apps.ecy.wa.gov/wats/ViewListing.aspx?LISTING_ID=6212 ("This listing was on the 1998 303(d) list, but has been moved to the new Category 4C (impaired by a non-pollutant) based on EPA Guidance for preparing the 2004 Integrated Report").

flow listings that had been so moved from the 1998 303(d) list to the current 305(b) list shows 48 separate listings for flow impairments.[21]

X. **Wyoming –** Section 9 of the state's 303(d)/305(b) report, "Surface Water Assessment Results," includes in Section 9.4 "Category 4 Surface Waters"; this section includes listings for "flow alterations" as a cause of impairment.[22] Section 9.5 is the "Category 5 Surface Waters (2012 303(d) List)," which does not include flow because of the state's interpretation of the 303(d) list as the repository for those waterways in need of TMDLs.[23]

[21] This list can be viewed at: http://earthlawcenter.org/static/uploads/documents/WA_1998_Flow_Listings_9-15-2014.pdf. The movement of impaired waters off the impaired waters list raises a question as to the use and application of US EPA guidance. In particular, US EPA regulations or policy cannot contravene the Clean Water Act, as (among other reasons) the Administrative Procedure Act makes clear that rules "found to be . . . in excess of statutory jurisdiction" shall be both held unlawful and "set aside." 5 U.S.C. § 706(2)(C); *see also Nat'l Mining Ass'n v. United States Army Corps of Engrs*, 145 F.3d 1399, 1409 (D.C. Cir. 1998), and *Oregon v. Ashcroft*, 368 F.3d 1118, 1129 (9th Cir. 2004) (quoting *NLRB v. Brown*, 380 U.S. 278, 291-92 (1965)). Arguments as to the reasons that flow impaired waters must be included on states' Section 303(d) lists have been offered at length before the California State Water Resources Control Board and North Coast Regional Water Quality Control Board. *See, e.g.*, ELC *et al.* Letter, *supra* n. 1.

[22] http://deq.state.wy.us/wqd/watershed/Program%20Documents/5.%20Water%20Quality%20Assessments%20&%20Integrated%20Report/Guidance/WY2012IR.pdf.

[23] *Id.*

I. California

2006 CWA SECTION 303(d) LIST OF WATER QUALITY LIMITED SEGMENTS REQUIRING TMDLS

LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD

USEPA APPROVAL DATE: JUNE 28, 2007

REGION	TYPE	NAME	CALWATER WATERSHED	POLLUTANT/STRESSOR	POTENTIAL SOURCES	ESTIMATED SIZE AFFECTED	PROPOSED TMDL COMPLETION
4	C	Ventura Marina Jetties	40311000	DDT	Source Unknown	0.69 Miles	2019
				PCBs (Polychlorinated biphenyls)	Source Unknown	0.69 Miles	2019
4	R	Ventura River Estuary	40210011	Algae	Nonpoint/Point Source	0.2 Miles	2019
				Eutrophic	Nonpoint/Point Source	0.2 Miles	2019
				Total Coliform	*Stables and horse property may be the sources.* Nonpoint Source	0.2 Miles	2019
				Trash	Nonpoint/Point Source	0.2 Miles	2019
4	R	Ventura River Reach 1 and 2 (Estuary to Weldon Canyon)	40210011	Algae	Nonpoint/Point Source	4.5 Miles	2019
4	R	Ventura River Reach 3 (Weldon Canyon to Confl. w/ Coyote Cr)	40210011	Pumping	Nonpoint Source	2.8 Miles	2019
				Water Diversion	Nonpoint Source	2.8 Miles	2019
4	R	Ventura River Reach 4 (Coyote Creek to Camino Cielo Rd)	40220021	Pumping	Nonpoint Source	19 Miles	2019
				Water Diversion	Nonpoint Source	19 Miles	2019

2006 CWA SECTION 303(d) LIST OF WATER QUALITY LIMITED SEGMENTS REQUIRING TMDLS

LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD

USEPA APPROVAL DATE: JUNE 28, 2007

REGION	TYPE	NAME	CALWATER WATERSHED	POLLUTANT/STRESSOR	POTENTIAL SOURCES	ESTIMATED SIZE AFFECTED	PROPOSED TMDL COMPLETION
4	R	Arroyo Seco Reach 2 (Figueroa St. to Riverside Dr.)	40515010	Coliform Bacteria	Nonpoint Source	4.4 Miles	2009
				Trash	Nonpoint Source	4.4 Miles	2007
4	C	Avalon Beach	40511000	Indicator bacteria	*Area affected is between Pier and BB restaurant (2/3), between Pier and BB restaurant (1/3), between storm drain and Pier (1/3), and between BB restaurant and the Tuna Club.* Nonpoint/Point Source	0.67 Miles	2019
4	R	Ballona Creek	40513000	Cadmium (sediment)	Nonpoint/Point Source	6.5 Miles	2005
				Cyanide	Source Unknown	6.5 Miles	2019
				Silver (sediment)	Nonpoint Source	6.5 Miles	2005
4	R	Ballona Creek Estuary	40513000	Shellfish Harvesting Advisory	Nonpoint/Point Source	2.3 Miles	2006
4	T	Ballona Creek Wetlands	40517000	Exotic Vegetation	Nonpoint Source	289 Acres	2019
				Habitat alterations	Nonpoint Source	289 Acres	2019
				Hydromodification	Nonpoint Source	289 Acres	2019

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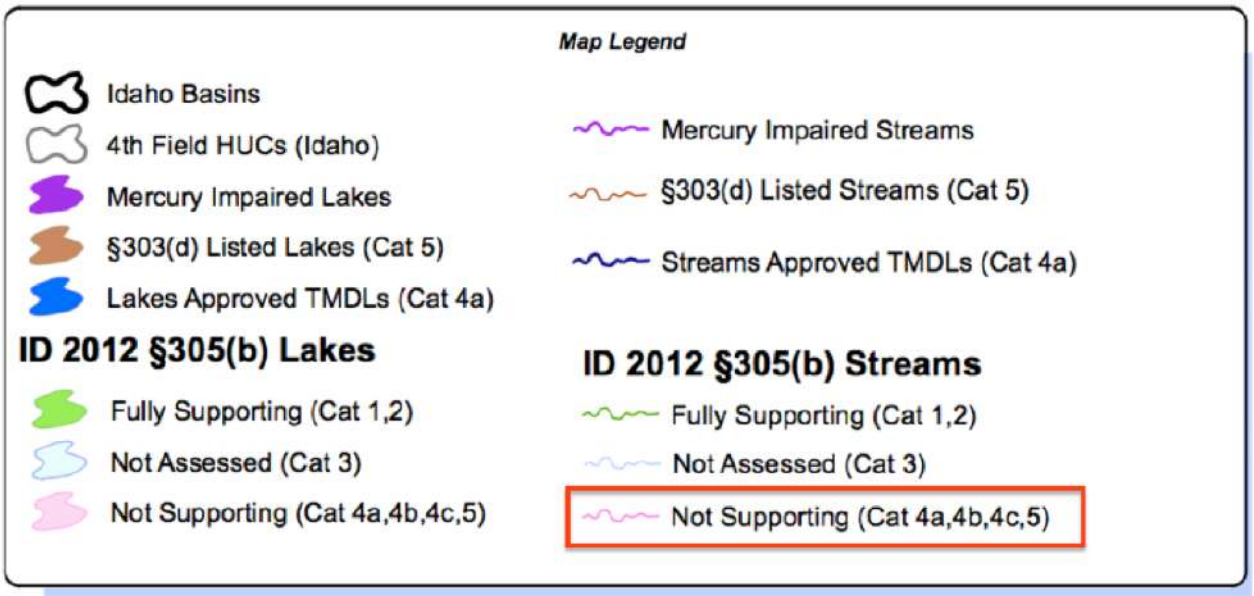
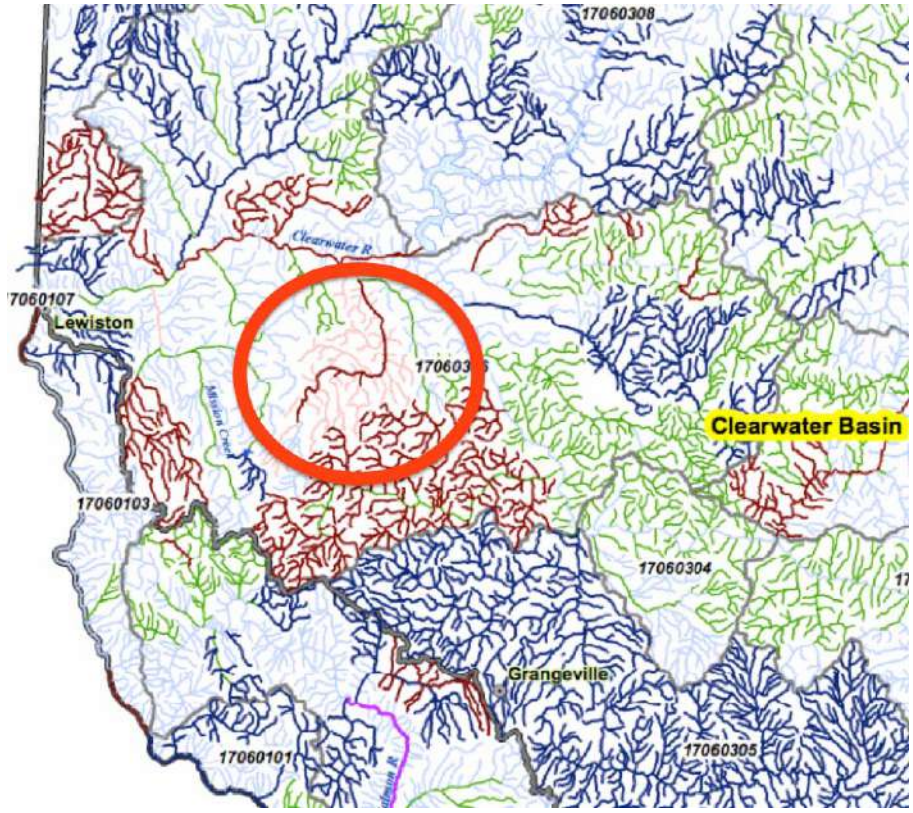
Source: SWRCB, "2006 CWA Section 303(d) List of Water Quality Impairment"; at: http://waterboards.ca.gov/water_issues/programs/tmdl/docs/303dlists2006/epa/r4_06_303d_reqtmdls.pdf.

II. Idaho

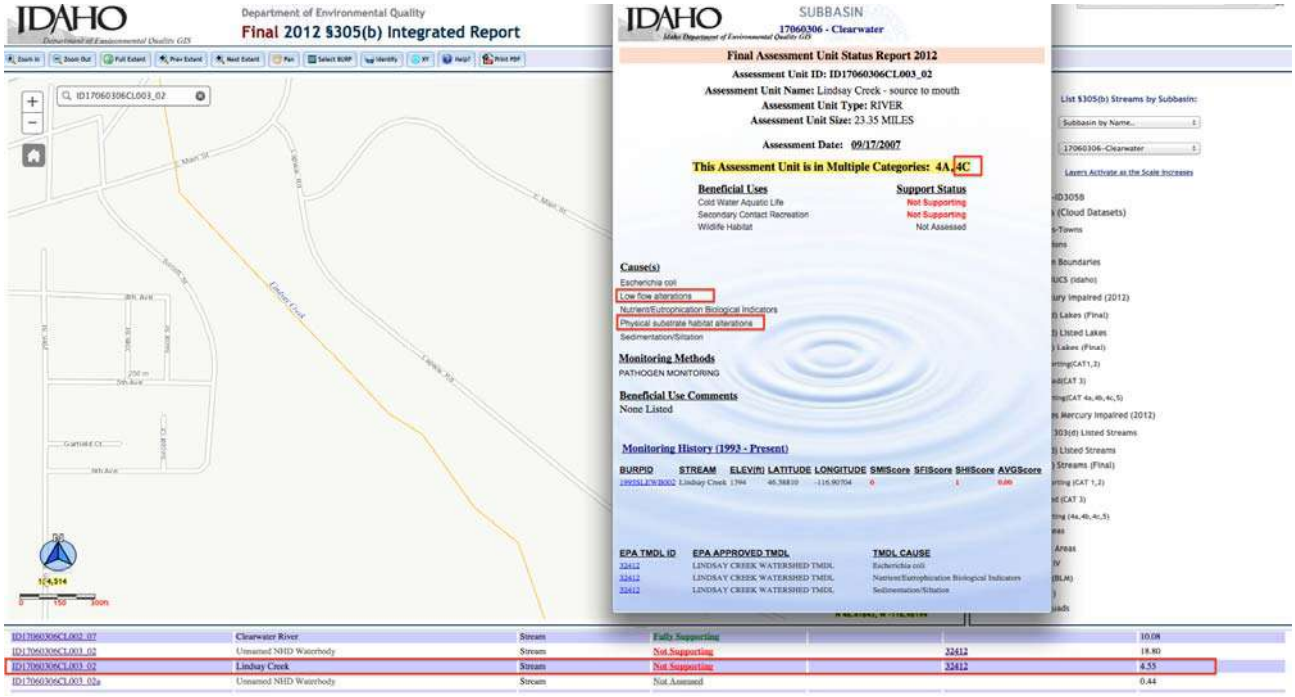
Integrated Map (Non-Interactive)





Source: Idaho Department of Environmental Quality, "2012 Integrated Report Map," at: https://www.deq.idaho.gov/media/1117324/2012-integrated-report-map.pdf.

Integrated Map (Interactive), Idaho (cont'd)



Source: Idaho Department of Environmental Quality, Final 2012 §305(b) Integrated Report (Interactive Map), at: http://mapcase.deq.idaho.gov/wq2012.

2012 Integrated Report: Category 4c: Waters Impaired by Pollution, Not a Pollutant

2012 Integrated Report: Category 4c: Waters Impaired by Pollution

Bear River

16010102	**Central Bear**		
ID16010102BR001_05	Bear River - Idaho/Wyoming border to railroad bridge	30.88	MILES
Low flow alterations	In 2006 EPA approved nutrient and sediment TMDLs. No TMDL written for flow alteration per EPA policy that "flow alteration is not a pollutant".		
ID16010102BR002_03	Pegram Creek - source to mouth	6.27	MILES
Physical substrate habitat alterations			
ID16010102BR006_02	Preuss Creek - USFS boundary to Geneva ditch	6.03	MILES
Physical substrate habitat alterations			
16010201	**Bear Lake**		
ID16010201BR002_05	Bear River-railroad bridge (T14N, R45E, Sec. 21) to Ovid Cr.	55.45	MILES
Low flow alterations			
ID16010201BR006_03	Lower Stauffer Creek - Spring Creek to Bear River	4.14	MILES
Low flow alterations			
Physical substrate habitat alterations			
ID16010201BR018_0La	Indian Creek	5.77	MILES
Low flow alterations			
Physical substrate habitat alterations			
ID16010201BR022_03a	Lower Georgetown Creek - left hand fork to mouth	3.91	MILES
Physical substrate habitat alterations			
16010202	**Middle Bear**		
ID16010202BR002_04	Cub River - Maple Creek to Border	3.94	MILES
Low flow alterations			
Other flow regime alterations			
ID16010202BR003_03	Cub River - Sugar Creek to Maple Creek	5.28	MILES
Other flow regime alterations			
ID16010202BR006_06	Bear River-Oneida Narrows Reservoir Dam to Idaho/Utah border	36.08	MILES
Low flow alterations			
ID16010202BR007_02a	Strawberry Creek	10.37	MILES
Low flow alterations			
Physical substrate habitat alterations			
ID16010202BR009_06	Bear River - Alexander Reservoir Dam to Densmore Creek	15.56	MILES
Other flow regime alterations			

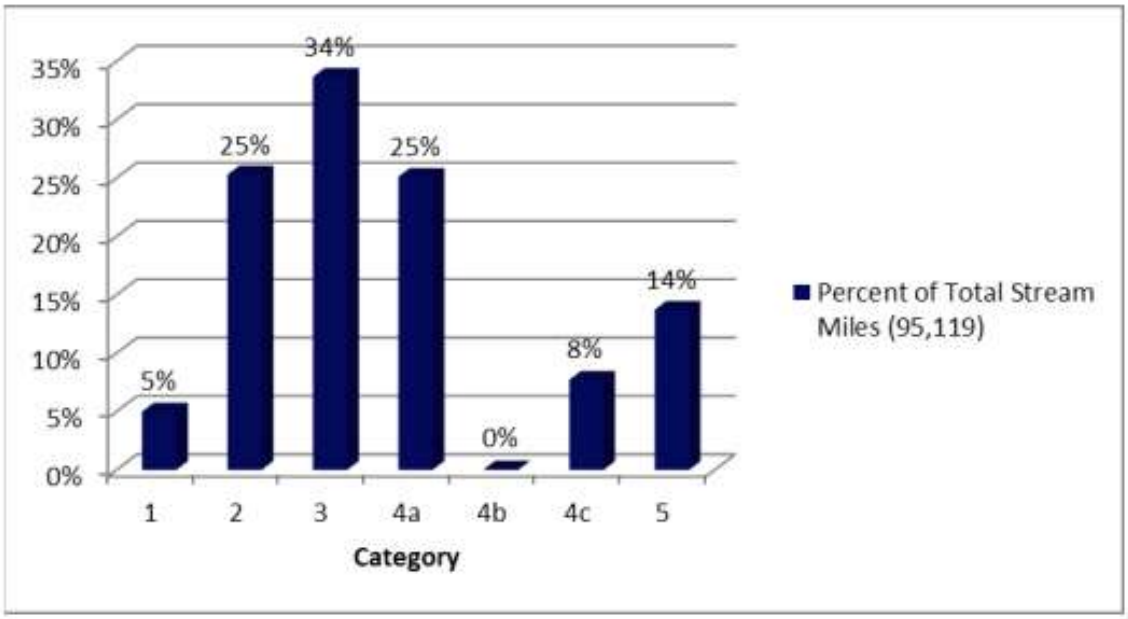
Source: Idaho Department of Environmental Quality, "2012 Integrated Report," at: https://www.deq.idaho.gov/media/1117323/integrated-report-2012-final-entire.pdf. (*Note*: There are 36 pages of Category 4c listings in the Integrated Report.)

9/17/2014, lsheehan@earthlaw.org

Table A. Category summary for streams and rivers.

Category	Miles	Number of Assessments Units
Category 1	4,751	370
Category 2	23,888	1,241
Category 3	32,034	1,567
Category 4a	23,894	2,324[a]
Category 4b	51	4[a]
Category 4c	7,342	547[a]
Category 5	13,237	977[a]

[a] AU-cause combinations



Source: Idaho Department of Environmental Quality, "2012 Integrated Report," at: https://www.deq.idaho.gov/media/1117323/integrated-report-2012-final-entire.pdf.

III. Michigan

Appendix B - Comprehensive list of assessment unit designated use support. This list is organized by 8, 10, and 12 digit HUCs. Additional information is provided for assessment units not supporting designated uses. For Category 4a the TMDL completion date is provided. For Category 4b the expected to attain by date is provided. For Category 4c the 'Pollutant ?' field is blank. For Category 5 the TMDL schedule is provided.

8 Digit HUC: 04050001 St. Joseph

AUID: 040500010105-04 Rivers/Streams in HUC 040500010105 RIVER 17.798556 MILES

Includes: Fisher Creek from Marble Lake confluence upstream to headwaters.

Designated Use	Use Support	Cause	Pollutant?	TMDL Schedule	TMDL Completion	Expected to Attain
Total Body Contact Recreation	Not Assessed					
Partial Body Contact Recreation	Not Assessed					
Navigation	Fully Supporting					
Industrial Water Supply	Fully Supporting					
Agriculture	Fully Supporting					
Warm Water Fishery	Not Supporting	Other anthropogenic substrate alterations				
Warm Water Fishery	Not Supporting	Other flow regime alterations	(This is Category 4c)			
Other Indigenous Aquatic Life and Wildlife	Fully Supporting					
Cold Water Fishery	Not Assessed					
Fish Consumption	Not Supporting	PCB in Fish Tissue	Y	2013		
Fish Consumption	Not Supporting	PCB in Water Column	Y	2013		

AUID: 040500010105-05 FIRST LAKE QUINCY PARK BEACH AND LAKE SHORELINE 0.2 MILES

First Lake, 301 Lake Blvd., Coldwater, Michigan

Designated Use	Use Support	Cause	Pollutant?	TMDL Schedule	TMDL Completion	Expected to Attain
Total Body Contact Recreation	Insufficient Information					
Partial Body Contact Recreation	Fully Supporting					
Navigation	Fully Supporting					
Industrial Water Supply	Fully Supporting					
Agriculture	Fully Supporting					
Warm Water Fishery	Not Assessed					
Other Indigenous Aquatic Life and Wildlife	Not Assessed					
Cold Water Fishery	Not Assessed					
Fish Consumption	Not Assessed					

AUID: 040500010105-NAL Unassessed Lakes in HUC 040500010105 FRESHWATER LAKE 91.181523 ACRES

Lakes only 'assessed' for Navigation, Agriculture, and Industrial Water Supply

Designated Use	Use Support	Cause	Pollutant?	TMDL Schedule	TMDL Completion	Expected to Attain
Total Body Contact Recreation	Not Assessed					
Partial Body Contact Recreation	Not Assessed					
Navigation	Fully Supporting					
Industrial Water Supply	Fully Supporting					
Agriculture	Fully Supporting					
Warm Water Fishery	Not Assessed					
Other Indigenous Aquatic Life and Wildlife	Not Assessed					
Cold Water Fishery	Not Assessed					
Fish Consumption	Not Assessed					

Source: Michigan DEQ, "Appendix B - Comprehensive List of Assessment Unit Designated Use Support," at: http://www.michigan.gov/documents/deq/wrd-swas-2012IR-appB1_370329_7.pdf. (*Note*: There are many more examples of 4c listings in the "Comprehensive List of Assessment Unit Designated Use Support.")

8 Digit HUC: 04060105 Boardman-Charlevoix

12 Digit HUC: 040601050507 Broadman River

AUID: 040601050507-01 **Rivers/Streams in HUC 040601050507** **RIVER 4.140817 MILES**
Includes: Kids Creek

Designated Use	Use Support	Cause	Pollutant?	TMDL Schedule	TMDL Completion	Expected to Attain
Other Indigenous Aquatic Life and Wildlife	Not Supporting	Other anthropogenic substrate alterations	Y	2013		
Other Indigenous Aquatic Life and Wildlife	Not Supporting	Other flow regime alterations	Y	2013		
Other Indigenous Aquatic Life and Wildlife	Not Supporting	PCB in Water Column	Y	2013		
Other Indigenous Aquatic Life and Wildlife	Not Supporting	Sedimentation/Siltation	Y	2013		
Fish Consumption	Not Supporting	PCB in Water Column	Y	2013		

AUID: 040601050507-03 **Rivers/Streams in HUC 040601050507** **RIVER 6.977377 MILES**
Includes: Kids Creek

Designated Use	Use Support	Cause	Pollutant?	TMDL Schedule	TMDL Completion	Expected to Attain
Other Indigenous Aquatic Life and Wildlife	Not Supporting	PCB in Water Column	Y	2013		
Fish Consumption	Not Supporting	PCB in Water Column	Y	2013		

AUID: 040601050507-04 **Rivers/Streams in HUC 040601050507** **RIVER 4.230916 MILES**
Includes: MILLER CREEK

Designated Use	Use Support	Cause	Pollutant?	TMDL Schedule	TMDL Completion	Expected to Attain
Other Indigenous Aquatic Life and Wildlife	Not Supporting	PCB in Water Column	Y	2013		
Fish Consumption	Not Supporting	PCB in Water Column	Y	2013		

AUID: 040601050507-05 **BASS LAKE** **FRESHWATER LAKE 273.7868 ACRES**
SW of Traverse City.

Designated Use	Use Support	Cause	Pollutant?	TMDL Schedule	TMDL Completion	Expected to Attain
Fish Consumption	Not Supporting	Mercury in Fish Tissue	Y	2013		

AUID: 040601050507-06 **Rivers/Streams in HUC 040601050507** **RIVER 29.631949 MILES**
Includes: Boardman River, Beitner Creek and Jack's Creek

Designated Use	Use Support	Cause	Pollutant?	TMDL Schedule	TMDL Completion	Expected to Attain
Other Indigenous Aquatic Life and Wildlife	Not Supporting	PCB in Water Column	Y	2013		
Fish Consumption	Not Supporting	PCB in Water Column	Y	2013		

AUID: 040601050507-07 **SILVER LAKE** **FRESHWATER LAKE 569.3184 ACRES**
6 miles SW of Traverse City.

Designated Use	Use Support	Cause	Pollutant?	TMDL Schedule	TMDL Completion	Expected to Attain
Fish Consumption	Not Supporting	Mercury in Fish Tissue	Y	2013		

AUID: 040601050507-08 **Rivers/Streams in HUC 040601050507** **RIVER 3.518203 MILES**
Includes: Boardman River

Designated Use	Use Support	Cause	Pollutant?	TMDL Schedule	TMDL Completion	Expected to Attain
Other Indigenous Aquatic Life and Wildlife	Not Supporting	PCB in Water Column	Y	2013		
Fish Consumption	Not Supporting	PCB in Water Column	Y	2013		

04060105 Boardman-Charlevoix

Source: Michigan DEQ, "Appendix C - Assessment Units Not Supporting Designated Uses (i.e. assessment units placed in Category 5)" [303(d) List], at: http://www.michigan.gov/documents/deq/wrd-swas-2012IR-appCdetail_370331_7.pdf. (*Note*: There are many more examples of flow alteration listings in this 303(d) List.)

IV. Montana

Appendix A: Impaired Waters

HUC 10020007 Madison **Watershed** Upper Missouri Tribs.

TMDL Planning Area	ID305B	Waterbody Name/Location	Category	Size	Units	Use Class	AqL	AG	DW	Rec	Cause Name	Source Name
Madison	MT41F004_020	O'DELL SPRING CREEK, headwaters to mouth (Madison River)	5	13.03	MILES	B-1	P	F	N	F	High Flow Regime	Grazing in Riparian or Shoreline Zones
											Other anthropogenic substrate alterations	Habitat Modification - other than Hydromodification
											Physical substrate habitat alterations	Impacts from Hydrostructure Flow Regulation/modification
												Irrigated Crop Production
												Source Unknown
Madison	MT41F004_040	INDIAN CREEK, Lee Metcalf Wilderness boundary to mouth (Madison River)	4C	6.34	MILES	B-1	P	F	F	P	Low flow alterations	Impacts from Hydrostructure Flow Regulation/modification
												Irrigated Crop Production
Madison	MT41F004_050	JACK CREEK, headwaters to mouth (Madison River)	5	15.18	MILES	B-1	P	F	F	P	Alteration in stream-side or littoral vegetative covers	Grazing in Riparian or Shoreline Zones
											Low flow alterations	Irrigated Crop Production
											Physical substrate habitat alterations	Natural Sources
											Sedimentation/Siltation	Streambank Modifications/destabilization
Madison	MT41F004_060	NORTH MEADOW CREEK, headwaters to mouth (Ennis Lake)	5	16.53	MILES	B-1	F	F	F	P	Low flow alterations	Channelization
											Phosphorus (Total)	Irrigated Crop Production
											Physical substrate habitat alterations	Natural Sources
											Sedimentation/Siltation	Streambank Modifications/destabilization
Madison	MT41F004_070	SOUTH MEADOW CREEK, headwaters to mouth (Ennis Lake)	5	12.98	MILES	B-1	N	F	F	P	Aquatic Plants - Native	Agriculture
											Chlorophyll-a	Impacts from Abandoned Mine Lands (Inactive)
											Lead	Irrigated Crop Production
											Physical substrate habitat alterations	
Madison	MT41F004_080	RUBY CREEK, headwaters to mouth (Madison River)	4C	15.91	MILES	B-1	N	F	F	P	Low flow alterations	Impacts from Hydrostructure Flow Regulation/modification
												Irrigated Crop Production
Madison	MT41F004_100	WEST FORK MADISON RIVER, headwaters to mouth (Madison River)	5	39.41	MILES	B-1	N	F	N	P	Alteration in stream-side or littoral vegetative covers	Agriculture
											Arsenic	Flow Alterations from Water Diversions
											Cadmium	Forest Roads (Road Construction and Use)
											Lead	Impacts from Hydrostructure Flow Regulation/modification
											Low flow alterations	Irrigated Crop Production

F=Full Support P=Partial Support T=Threatened N=Not Supporting I=Insufficient Information X=Not Assessed

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Source: Montana Department of Environmental Quality, "Draft 2014 Water Quality Integrated Report," App. A - Impaired Waters, at: http://deq.mt.gov/WQInfo/CWAIC/Reports/IRs/2012/Appendix_A.pdf. (*Note*: There are many more examples of both 4c and 5 listings with the cause of low flow alterations in this Impaired Waters list.)

Table 4-3. Top 10 Causes of Impairment – All Assessment Units

Cause Name	# of AUs
Sedimentation/Siltation	457
Alteration in streamside or littoral vegetative covers[1]	411
Low flow alterations[1]	237
Phosphorus (Total)	235
Nitrogen (Total)	207
Lead	178
Physical substrate habitat alterations[1]	159
Copper	150
Arsenic	127
Cadmium	119

[1] These causes are pollution, or non-pollutants, and thus TMDLs cannot be developed.

Source: Montana Department of Environmental Quality, "Draft 2014 Water Quality Integrated Report," Table 4-3, at: http://deq.mt.gov/WQInfo/CWAIC/Reports/IRs/2012/Final2012IR.pdf.

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V. New Mexico

Integrated List

Three Rivers (Perennial prt HWY 54 to USFS exc Mescalero) **Tularosa Valley**

Assessment Unit ID:	Size (mi or ac):	WQS reference:	Monitoring Schedule:	Cycle Last Assessed:	IR Category:
NM-2802_00	14.68	20.6.4.802	2012	2006	4C

Use Information:

Designated Use (s):	Attainment:
Domestic Water Supply	Not Assessed
High Quality Coldwater Aquatic Life	Not Supporting
Irrigation	Not Assessed
Livestock Watering	Not Assessed
Primary Contact	Not Assessed
Wildlife Habitat	Not Assessed

Assessment Information:

Probable Causes of Impairment:	TMDL Schedule:
Low flow alterations	

Assessment Unit Comments: There is extensive irrigation in the reach from surface water diversion as well as ground water pumping in the lower portion of the assessment unit. Therefore, this AU is listed under Category 4C with an impairment of Low Flow Alteration diversion (flow modification) "pollution" is de-watering this reach.

Three Rivers (USFS bnd to headwaters) **Tularosa Valley**

Assessment Unit ID:	Size (mi or ac):	WQS reference:	Monitoring Schedule:	Cycle Last Assessed:	IR Category:
NM-2802_01	4.16	20.6.4.802	2012	2006	5/5A

Use Information:

Designated Use (s):	Attainment:
Domestic Water Supply	Fully Supporting
High Quality Coldwater Aquatic Life	Fully Supporting
Irrigation	Fully Supporting
Livestock Watering	Fully Supporting
Primary Contact	Not Supporting
Wildlife Habitat	Fully Supporting

Assessment Information:

Probable Causes of Impairment:	TMDL Schedule:
E. coli	2010

Probable Sources of Impairment:

Other Recreational Pollution Sources

Assessment Unit Comments: Per USFS personnel (2/4/09), livestock grazing is not allowed along this stream reach. It is a popular horseback riding trail with several crossings.

Source: New Mexico Environment Department Surface Water Quality Bureau, "2012 – 2014 State of New Mexico Clean Water Act §303(d)/§305(b) Integrated Report, App. A, List of Assessed Surface Waters, US EPA—Approved (May 8, 20122)," at: http://www.nmenv.state.nm.us/swqb/303d-305b/2012-2014/AppendixA-USEPA-Approved303dList.pdf. (*Note:* Here, there is both an "Integrated List" and a 303(d) List for Category 5. There are many more examples of 4c listings in this Integrated List.)

VI. Ohio

Section L4. Section 303(d) List of Prioritized Impaired Waters									
Assessment Unit	Assessment Unit Name	Sq. Mi. in Ohio	Human Health	Recre-ation	Aquatic Life	PDW Supply	Priority Points	Next Field Monitoring	Projected TMDL
05080001 03 05	Bokengehalas Creek	27.74	5h	5	5	0	8	2023	2026
05080001 03 06	Brandywine Creek-Great Miami River	33.30	5h	5	5	0	8	2023	2026
05080002 01 04	Holes Creek	27.13	5h	5	5	0	8	2025	2028
05080002 90 01	Great Miami River Mainstem (Mad River to Four Mile Creek)	3298	5	5	5	0	8	2025	2014
05090103 02 03	Little Pine Creek	29.52	5h	5	5	0	8	2025	2028
05090202 10 05	West Fork East Fork Little Miami River	28.88	1h	3	5hx	5	8	2012	2015
24001 001	Lake Erie Western Basin Shoreline (including Maumee Bay and Sandusky Bay)	N/A	5	5	5	1	8	2013	2016
04100006 02 02	Deer Creek-Bean Creek	31.73	3	5	5hx	0	7	2013	2016
04100007 04 03	Honey Run	13.27	5h	5	5	3i	7	2025	2028
04100010 02 02	East Branch Portage River	36.15	5	4A	5	3i	7	2023	2026
04100011 10 01	East Branch East Branch Wolf Creek	21.90	3	5	5	0	7	2024	2027
04100011 10 02	Town of New Riegel-East Branch Wolf Creek	33.40	3	5	5	0	7	2024	2027
04100011 12 03	Green Creek	30.78	1	5	5	3i	7	2024	2027
04110004 01 04	Center Creek-Grand River	31.43	5h	5	5	0	7	2019	2022
04110004 02 02	Middle Rock Creek	21.37	1	5	5	0	7	2019	2022
04110004 03 05	Plumb Creek-Grand River	19.24	5	5	1	0	7	2019	2022
05030101 06 10	Bieler Run-Little Beaver Creek	16.69	5	5	1ht	0	7	2018	2021
05030102 01 04	Frontal Pymatuning Reservoir	42.67	5h	5	5	0	7	2023	2026
05030102 03 04	Booth Run-Pymatuning Creek	59.75	1	5	4C	0	7	2023	2026
05030102 06 01	Yankee Run	44.81	3	5	5	0	7	2023	2026
05030103 06 03	City of Warren-Mahoning River	40.38	5	5h	3x	0	7	2013	2016
05030103 90 01	Mahoning River Mainstem (Eagle Creek to Pennsylvania Border)	1075	5	3i	5	0	7	2013	2016
05030106 03 04	Flat Run-Wheeling Creek	23.29	5h	5	5	0	7	2025	2028
05030106 12 04	Glenns Run-Ohio River	31.29	5h	5	5	0	7	2025	2028
05040001 04 06	Headwaters Sandy Creek	32.13	5	5	5	0	7	2025	2028
05040001 06 05	Armstrong Run-Sandy Creek	32.20	5	5	1	0	7	2025	2028
05040002 01 01	Marsh Run	20.84	3	5	5	3i	7	2023	2026
05040002 01 05	Shipp Creek-Black Fork Mohican River	61.62	3	5	5	0	7	2023	2026
05040002 06 05	Jerome Fork-Mohican River	35.55	3i	5	5	0	7	2023	2026
05040003 01 01	Headwaters North Branch Kokosing River	45.29	1	5	5	0	7	2022	2025
05040003 02 01	Headwaters Kokosing River	36.42	3	5	5	0	7	2022	2025
05040003 02 02	Mile Run-Kokosing River	38.60	3	5	5	0	7	2022	2025

Section L4. Section 303(d) List of Prioritized Impaired Waters									
Assessment Unit	Assessment Unit Name	Sq. Mi. in Ohio	Human Health	Recre-ation	Aquatic Life	PDW Supply	Priority Points	Next Field Monitoring	Projected TMDL
05060002 16 05	Carroll Run-Scioto River	16.05	5h	3	5hx	0	4	2011	2014
05060002 90 01	Scioto River Mainstem (Big Darby Creek to Paint Creek)	3866	5	3	5	0	4	2011	2014
05060002 90 02	Scioto River Mainstem (Paint Creek to Sunfish Creek)	5936	5	3i	5	0	4	2011	2014
05060003 04 01	South Fork Lees Creek	19.97	3	5	5	0	4	2022	2025
05060003 04 07	Big Branch-Rattlesnake Creek	20.48	3	5	1	0	4	2022	2025
05060003 07 03	Lower Twin Creek	16.60	3	5	3i	0	4	2022	2025
05060003 08 04	Mills Branch-Compton Creek	28.79	3	5	1	0	4	2022	2025
05060003 09 04	Biers Run-North Fork Paint Creek	31.32	3i	5	1	0	4	2022	2025
05080001 02 04	Calico Creek-Muchnippi Creek	18.21	3	1	5	0	4	2023	2026
05080001 05 02	Mile Creek	62.72	3	5	5	0	4	2023	2026
05080001 06 01	Nine Mile Creek	26.14	3	5	1	0	4	2023	2026
05080001 06 03	Turtle Creek	35.84	3	1	5	0	4	2023	2026
05080001 07 01	Leatherwood Creek	16.94	3	5	1	0	4	2024	2027
05080001 07 02	Mosquito Creek	38.30	1h	5	4C	3i	4	2024	2027
05080001 07 03	Brush Creek-Great Miami River	30.19	3	5	3i	0	4	2024	2027
05080001 08 02	Headwaters Lost Creek	14.10	3	5	1	0	4	2024	2027
05080001 20 01	East Fork Honey Creek	13.00	3	5	1	0	4	2024	2027
05080001 20 02	West Fork Honey Creek	20.91	3	5	1	0	4	2024	2027
05080001 20 03	Indian Creek	25.85	3	5	1	0	4	2024	2027
05080002 01 02	Headwaters Wolf Creek	23.05	5h	5	5	0	4	2025	2028
05080002 01 06	Opossum Creek-Great Miami River	19.01	5	5	1	0	4	2025	2028
05080002 03 05	Little Twin Creek	22.71	5h	5h	4n	0	4	2019	2022
05080002 04 03	Clear Creek	53.01	3	5	1	0	4	2025	2028
05080002 08 03	Beals Run-Indian Creek	73.96	5	5h	4n	0	4	2019	2022
05090103 01 01	Solida Creek-Ohio River	34.25	3	5	5	0	4	2025	2028
05090103 01 04	Storms Creek	37.20	1	1	5	0	4	2025	2028
05090103 01 06	Ginat Creek	13.57	3	5	5	0	4	2025	2028
05090103 01 07	Grays Branch-Ohio River	33.89	3	5	3i	0	4	2025	2028
05090103 02 04	Howard Run-Pine Creek	38.70	1	5	1	0	4	2025	2028
05090103 06 01	Headwaters Rocky Fork	26.24	3	5	4n	0	4	2025	2028
05090201 02 01	Headwaters Turkey Creek	16.31	3	3	5hx	0	4	2016	2019
05090201 02 02	Odell Creek-Turkey Creek	30.95	3	3	5hx	0	4	2016	2019
05090201 02 03	Pond Run	12.18	3	3	5hx	0	4	2016	2019
05090201 02 04	Briery Branch-Ohio River	35.94	3	3	5hx	0	4	2016	2019

Source: Ohio Environmental Protection Agency, Ohio Integrated Water Quality Monitoring and Assessment Report, "L4: Section 303(d) List of Prioritized Impaired Waters (Category 5)," at: http://www.epa.ohio.gov/portals/35/tmdl/2012IntReport/IR12SectionL4final.pdf and http://www.epa.ohio.gov/dsw/tmdl/OhioIntegratedReport.aspx#123199061-report (for all integrated report documents).
(*Note*: There are many more examples of 4c listings in this 303(d) List.)

Table G-3. Prevalence of the top five causes of aquatic life impairment in watershed and large river assessment units based on biological and water quality survey data collected from 2001-2010.

Assessment Unit (AU)	#	Number & Percentage of Monitored AUs with Impaired Aquatic Life Use Listed with a Top Five Cause of Impairment[1]				
		Siltation/ Sedimentation	Nutrients	Habitat Modification	Hydromodification	Organic Enrichment/ Dissolved Oxygen
Watershed	**1,538**					
Monitored 2001-2010	908					
Impaired aquatic life use	628	373 (58%)	377 (60%)	280 (45%)	226 (36%)	324 (52%)
No impairment	280					
Large River	**38**					
Monitored 2001-2010	31					
Impaired aquatic life use	19	4 (21%)	7 (37%)	10 (53%)	4 (21%)	13 (68%)
No impairment	12					

[1] Listed as an aquatic life use impairment cause for at least one stream within the watershed AU or one reach within the large river AU.

Source: Ohio 2012 Integrated Report, "Evaluating Beneficial Use: Aquatic Life; at:http://www.epa.ohio.gov/portals/35/tmdl/2012IntReport/IR12SectionGfinal.pdf (can actually track impairment causes accurately if list for them – example for aquatic life impairments)

"Water Quality Assessment Units - 2014 Integrated Report (Map Portal)," Ohio (Cont'd)

Watershed assessment units

Assessment_Unit_ID	Assessment_Unit_Name	ACRES	SQ_MILES	Aquatic Life Use Category	Comments	Cause1	Cause2	Cause3	Source1	Source2	year_sampled
04110001 03 03	Coon Creek-East Branch Black River	24515.34	38.31	4C	TMDLs for pollutants impairing designated or recommended aquatic life uses in the Black River basin were approved by the U.S. EPA on August 20, 2008. Monitoring in support of the TMDL report was conducted in 1996, 1997, 2000, and 2001. The monitoring report for data collected in 1997 is available at http://www.epa.ohio.gov/dsw/document_index/psclindx.aspx (See Index Number MAS/1998-11-4). Follow-up biological, physical habitat, and chemical water quality monitoring was conducted in 2012. Detected aquatic life use impairment was attributed to natural low summer flow conditions and the attendant effects on physical habitat quality and biotas. The original TMDL report and status of follow-up reports and analyses based on 2012 monitoring and assessment are available via the Black River tab at http://epa.ohio.gov/dsw/tmdl/BlackRockyRivers.aspx.	sedimentation/siltation			dam or impoundment		2012
04110001 04 04	Jackson Ditch-East Branch Black River	21524.91	33.63	4C	TMDLs for pollutants impairing designated or recommended aquatic life uses in the Black River basin were approved by the U.S. EPA on August 20, 2008. Monitoring in support of the TMDL report was conducted in 1996, 1997, 2000, and 2001. The monitoring report for data collected in 1997 is available at http://www.epa.ohio.gov/dsw/document_index/psclindx.aspx (See Index Number MAS/1998-11-4). Follow-up biological, physical habitat, and chemical water quality monitoring was conducted in 2012. As aquatic life use impairment was detected in the assessment unit, TMDLs will be reviewed and revised accordingly. The original TMDL report and status of follow-up reports and analyses based on 2012 monitoring and assessment are available via the Black River tab at http://epa.ohio.gov/dsw/tmdl/BlackRockyRivers.aspx.	sedimentation/siltation	natural conditions (flow or habitat)		dam or impoundment	natural sources	2012
04110001 07 02	Mouth Beaver Creek	16280.71	25.44	4C	Assessment based on study at 4 sampling locations (RMs 9.1-7.0 in the vicinity of South Amherst) conducted by EnviroScience, Inc. in 2008 using QDC Level 3 fish and macroinvertebrate practitioners; 2 sites (>20 sq. mi. and < 50 sq. mi.) were in full attainment, 1 site (< 20 sq. mi.) in partial attainment, and 1 site (<20 sq. mi.) in non-attainment of the designated WWH aquatic life use.	direct habitat alterations	sedimentation/siltation		dam or impoundment	upstream impoundment	2008
05030102 03 04	Booth Run-Pymatuning Creek	38241.49	59.75	4C	Extensive biological, physical habitat, and chemical water quality monitoring was conducted in several Ohio tributaries to the Shenango River in 2009. A report on the findings of the basin survey is available at http://www.epa.ohio.gov/dsw/document_index/psclindx.aspx (See Index Number EAS/2011-1-2). Development of TMDLs for pollutants impairing designated or recommended aquatic life uses is underway. Status of reports and analyses are available at http://epa.ohio.gov/dsw/tmdl/OhioTributariesShenangoRiver.aspx.	natural conditions (flow or habitat)	oxygen, dissolved	other flow regime alterations	natural sources	dam or impoundment	2008
05040002 05 01	Upper Muddy Fork Mohican River	16298.08	26.59	4C	Extensive biological, physical habitat, and chemical water quality monitoring was conducted in the Mohican River basin in 2007. A report on the findings of the basin survey is available at http://www.epa.ohio.gov/dsw/document_index/psclindx.aspx (See Index Number EAS/2009-5-4). Development of TMDLs for pollutants impairing designated or recommended aquatic life uses is underway. Status of reports and analyses are available via the Mohican River tab at http://epa.ohio.gov/dsw/tmdl/MuskingumRiver.aspx.	other flow regime alterations			dam or impoundment		2007
05040004 04 07	Painter Creek-Jonathon Creek	36789.71	60.81	4C	TMDLs for pollutants impairing designated or recommended aquatic life uses in the Moxahala Creek watershed were approved by U.S. EPA on July 10, 2013. The TMDL report is available via the Moxahala Creek tab at http://epa.ohio.gov/dsw/tmdl/MuskingumRiver.aspx. Monitoring in support of the TMDL report was conducted in 2008. A report on the findings of the watershed survey is available at http://www.epa.ohio.gov/dsw/document_index/psclindx.aspx (See Index Number EAS/2009-4-2).	direct habitat alterations			dam or impoundment		2008
05060001 10 05	Brandige Run-Olentangy River	19064.81	29.79	4C	TMDLs for pollutants impairing designated or recommended aquatic life uses in the Olentangy River basin were approved by U.S. EPA on September 19, 2007. The TMDL report is available via the Olentangy River tab at http://epa.ohio.gov/dsw/tmdl/SciotoRiver.aspx. Monitoring in support of the TMDL report was conducted in 2003. The monitoring report is available at http://www.epa.ohio.gov/dsw/document_index/psclindx.aspx (See Index Number EAS/2005-12-6). Most of this assessment unit consists of Delaware Lake and includes no large streams not significantly inundated by the lake. Much of the reach identified as the Olentangy River in the assessment unit is impounded by the base elevation of the Delaware Lake pool.	other flow regime alterations	sedimentation/siltation		dam or impoundment		2003

Source: Table provided via electronic mail by Tinka J. Mount (trinka.mount@epa.ohio.gov), Ohio EPA, Division of Surface Water, Re: Ohio 2014 Integrated Report (Sept. 9, 2014), *data available at*: http://wwwapp.epa.ohio.gov/gis/mapportal/IR2014.html.

VII. Tennessee

Section 303(d) List, pp. 17, 92, 127

Final Version 2012 303(d) LIST (Collins River Basin cont.)

Waterbody ID	Impacted Waterbody	County	Miles/Acres Impaired	CAUSE / TMDL Priority		Pollutant Source	COMMENTS
TN05130107 012 – 0100	LOCKE BRANCH	Warren	4.56	Alteration in stream-side or littoral vegetative cover Loss of biological integrity due to siltation	L L	Pasture Grazing	Category 5. TMDLs needed.
TN05130107 012 – 0200	FULTZ CREEK	Warren	14.4	Alteration in stream-side or littoral vegetative cover Loss of biological integrity due to siltation	L L	Silviculture	Category 5. TMDLs needed.
TN05130107 012 – 0400	WEST FORK HICKORY CREEK	Coffee	54.54	Escherichia coli	H	Pasture Grazing	Category 5. (One or more uses impaired.)
TN05130107 012 – 0410	MEADOW BRANCH	Coffee	7.89	Escherichia coli	H	Pasture Grazing	Category 5. (One or more uses impaired.)
TN05130107 016 – 0150	SAVAGE CREEK	Grundy Sequatchie	22.1	Flow Alteration	NA	Upstream Impoundment	Category 4c. (Impacts not caused by pollutant.)
TN05130107 016 – 0740	LAUREL CREEK	Grundy	3.93	Loss of biological integrity due to siltation	L	Specialty Crop Production	Category 5. TMDL needed.
TN05130107 016 – 2000	COLLINS RIVER	Grundy	5.8	Iron Manganese pH	M M M	Abandoned Mining	Stream is Category 5. (One or more uses impaired.)
TN05130107 023 – 0200	DRY CREEK	Warren Sequatchie	31.25	Aluminum Sulfates pH Manganese Iron	M M M M M	Abandoned Mining	Stream is Category 5. (One or more uses impaired.)
TN05130107 023 – 0230	HE CREEK	Sequatchie	1.45	pH Manganese Iron	M M M	Coal Mining Permitted Discharge Abandoned Mining	Stream is Category 5. (One or more uses impaired.)
TN05130107 023 – 0231	LITTLE HE CREEK	Sequatchie	1.98	pH Manganese Iron	M M M	Coal Mining Permitted Discharge Abandoned Mining	Stream is Category 5. (One or more uses impaired.)
TN05130107 023 – 0232	BIG HE CREEK	Sequatchie	2.95	pH Manganese Iron	M M M	Coal Mining Permitted Discharge Abandoned Mining	Stream is Category 5. (One or more uses impaired.)

Final Version 2012 303(d) LIST (Emory River Watershed cont.)

Waterbody ID	Impacted Waterbody	County	Miles/Acres Impaired	CAUSE / TMDL Priority		Pollutant Source	COMMENTS
TN06010208 015 – 0810	ONE MILE CREEK	Cumberland	6.5	Loss of biological integrity due to siltation	NA	Land Development	Category 4a. EPA approved a siltation TMDL that addresses the known pollutant.
TN06010208 015 – 0911	BAGWELL CREEK	Cumberland	3.32	Flow Alteration	NA	Upstream Impoundment	Category 4c. Impacts not from a pollutant
TN06010208 015 – 0950	NORTH CREEK	Cumberland	1.63	Flow Alteration	NA	Upstream Impoundment	Category 4c. Impacts not from a pollutant
TN06010208 015 – 1310	BLACK GUM BRANCH	Cumberland	1.41	Flow Alteration	NA	Upstream Impoundment	Category 4c. Impacts not from a pollutant
TN06010208 020 – 0100	SMITH BRANCH	Morgan	5.4	pH	NA	Abandoned Mines	Category 4a. EPA approved a pH TMDL that addresses the known pollutant.
TN06010208 020 – 0400	GOLLIHER CREEK	Morgan	5.6	Manganese Iron pH	H H NA	Abandoned Mines	Category 5. EPA approved pH TMDL that addresses some of the known pollutants.
TN06010208 020 – 0500	FAGON MILL CREEK	Morgan	2.6	Manganese pH	H NA	Abandoned Mines	Category 5. EPA approved pH TMDL that addresses some of the known pollutants.
TN06010208 020 – 0600	LITTLE LAUREL CREEK	Morgan	1.32	pH	NA	Abandoned Mines	Category 4a. EPA approved a pH TMDL that addresses the known pollutant.
TN06010208 020 – 0700	LAUREL CREEK	Morgan	3.7	pH	NA	Abandoned Mines	Category 4a. EPA approved a pH TMDL that addresses the known pollutant.
TN06010208 020 – 3000	CRAB ORCHARD CREEK	Morgan	7.9	Manganese pH	H NA	Abandoned Mines	Category 5. EPA approved pH TMDL that addresses some of the known pollutants.

Final Version 2012 303(d) LIST (Duck River Watershed cont.)

Waterbody ID	Impacted Waterbody	County	Miles/Acres Impaired	CAUSE / TMDL Priority		Pollutant Source	COMMENTS
TN06040003 041 – 1100	DOG BRANCH	Hickman Maury	13.8	Escherichia coli	NA	Pasture Grazing	Category 4a. EPA approved a pathogen TMDL that addresses the known pollutant.
TN06040003 050 - 0620	GRAB CREEK	Dickson	3.94	Escherichia coli	H	Pasture Grazing Discharges from MS4 area	Stream is Category 5. One or more uses are impaired.
TN06040003 060 – 0700	EGYPT HOLLOW CREEK	Humphreys	4.66	Flow Alterations Low dissolved oxygen Manganese	NA L H	Upstream Impoundment	Category 5. Flow is Category 4C, Impacts not due to a pollutant.
TN06040003 062 – 3000	BLUE CREEK	Humphreys	5.1	Nitrate+Nitrite Total Phosphorus Low dissolved oxygen Solids Escherichia coli	M M L L NA	Municipal Point Source	McEwen STP. Category 5. EPA approved a pathogen TMDL that addresses some of the known pollutants.

Source: Tennessee Department of Environmental and Conservation, "Year 2012 303(d) List" (Jan. 2014), at: www.tn.gov/environment/water/docs/wpc/2012-final-303d-list.pdf (numerous other examples exist).

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VIII. Vermont

2014 Priority Waters List

Impaired by pollutant	Altered by non-pollutant
Part A – 303(d) List of Impaired Waters, including waters proposed for de-listing (submitted to EPA for approval 6-20-14, pdf, 296 KB) These waters are assessed as impaired due to one or more pollutants for which a TMDL is required to be developed. This list is developed in even-numbered years and submitted to EPA for approval according federal Clean Water Act regulations.	Part E – Waters altered by aquatic invasive species (pdf, 120KB) These waters are assessed as altered where aquatic habitat and/or other designated uses are not supported due to the extent of invasive aquatic species.
Part B – Impaired waters for which a TMDL is not required (pdf, 199KB) These waters are assessed as impaired by a pollutant but because other pollution control mechanisms are in place, no TMDL is required to be developed	Part F – Waters altered by flow regulation (pdf, 132KB) These waters are assessed as altered due to hydrologic factors. These often include a lack of flow, water level or flow fluctuations or some other modified hydrologic condition.
Part D – Impaired waters with an approved TMDL (pdf, 142KB) These waters are assessed as impaired by a pollutant and have a completed TMDL that has been approved by EPA.	

Source: "Condition of Vermont Waters - 2014 Priority Waters List [Draft]" at: www.vtwaterquality.org/mapp/htm/mp_assessment.htm#mapp303d.
(*Note*: In addition to the "Integrated List," the 2014 Priority Waters List also includes separate sections for categories of impairment.)

Part F. Waters appearing below are altered by flow regulation. These are priority waters for management action.

Waterbody ID	Segment Name/ Description	Use(s) Impacted	Surface Water Quality Problem	Current Status/Management or Control Activity	Projected WQS Compliance Year
VT01-03	BASIN BROOK	ALS	POSSIBLE LACK OF MINIMUM FLOW BELOW WATER SUPPLY WITHDRAWAL POINT (THREAT)	WSID #5017 - NORTH BENNINGTON WATER DEPT; SERVES AS BACK UP SUPPLY SOURCE TO GRAVEL WELL FIELD	
	BOLLES BROOK/ROARING BRANCH, INTAKE TO CITY STREAM CONFLUENCE	ALS	POSSIBLE LACK OF MINIMUM FLOW BELOW WATER SUPPLY WITHDRAWAL POINT (THREAT)	WSID #5016 - BENNINGTON WATER DEPT; ASSESSMENT OF WATER WITHDRAWAL IMPACT DIFFICULT GIVEN LOW PRODUCTIVITY & LOW pH EFFECT	
VT03-04	LEICESTER RIVER, FROM DAM ON LAKE DUNMORE TO 1.0 MILE DOWNSTREAM	ALL USES	ARTIFICIAL FLOW REGULATION & CONDITION BY HYDRO	UNLICENSED FACILITY	2017
	LEICESTER RIVER, FROM SALISBURY DAM TO 5 MILES DOWNSTREAM	ALL USES	ARTIFICIAL FLOW REGULATION & CONDITION BY HYDRO	UNLICENSED FACILITY	2017
		ALS	POSSIBLE DOWNSTREAM FISH PASSAGE PROBLEM AT DAM (THREAT)	UNLICENSED FACILITY	2017
VT03-04L05	LAKE DUNMORE (Salisbury)	ALS	WATER LEVEL MGMT BY HYDRO ALTERS AQUATIC BIOTA	LAKE ASSOC. HAS WATER LEVEL AGREEMENT W/CVPS	2017
VT03-05	OTTER CREEK, 0.1 MILES BELOW PROCTOR DAM	AES	ARTIFICIAL DEWATERING OF LARGE WATERFALL BY HYDRO	FERC LICENSE EXPIRES IN 2012	2012
VT03-06	FURNACE BROOK		LACK OF MINIMUM FLOW BELOW WATER SUPPLY WITHDRAWL POINT	BACKUP WATER SUPPLY FOR PROCTOR	
	KILN BROOK	ALS	LACK OF MINIMUM FLOW BELOW WATER SUPPLY WITHDRAWAL POINT (THREAT)	WSID #5228 - PROCTOR WATER DEPT; MUNICIPALITY STARTED MONITORING STREAMFLOWS IN 2007 IN COOP WITH ANR	
VT03-12	SOUTH BRANCH, MIDDLEBURY RIVER (1.4 MILES)	ALS	ARTIFICIAL FLOW CONDITION, INSUFFICIENT FLOW BELOW SNOW BOWL SNOWMAKING WATER WITHDRAWAL	PARTIAL SUPPORT 1.4 MI (6.0 MI TOTAL LENGTH)	

Source: Vermont Department of Environmental Conservation - Watershed Management Division, "State of Vermont 2012 List of Priority Surface Waters," at: http://www.watershedmanagement.vt.gov/mapp/docs/mp_2012_priority_waters_lists.pdf.

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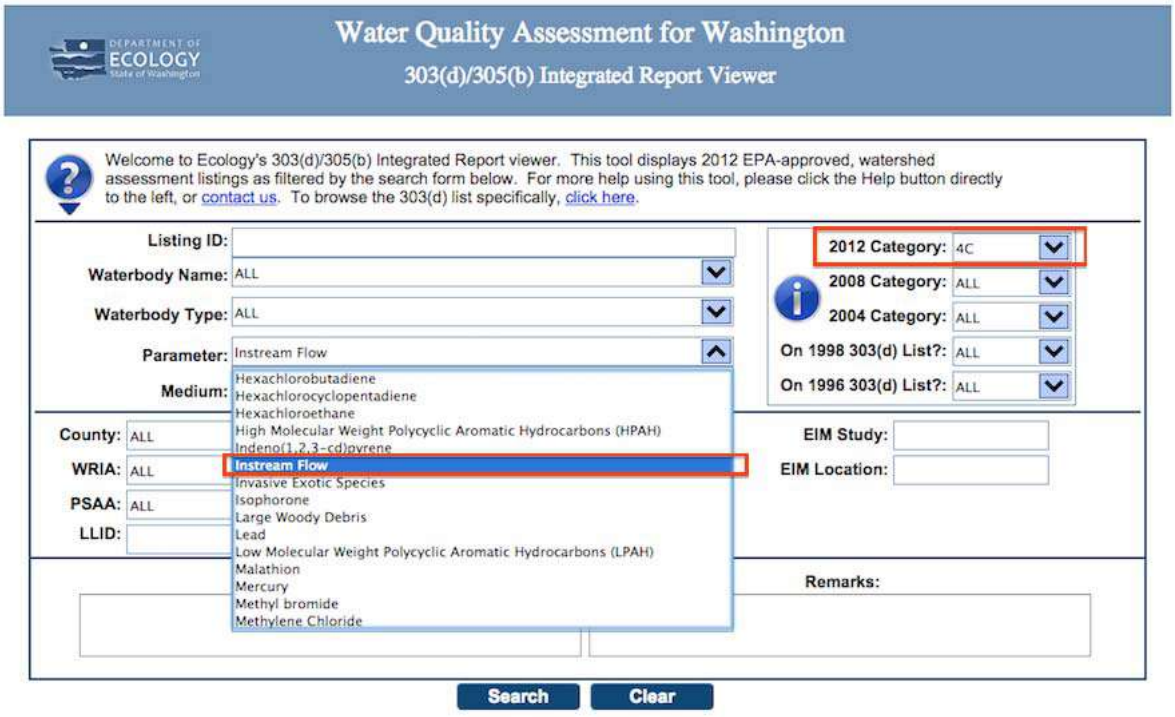
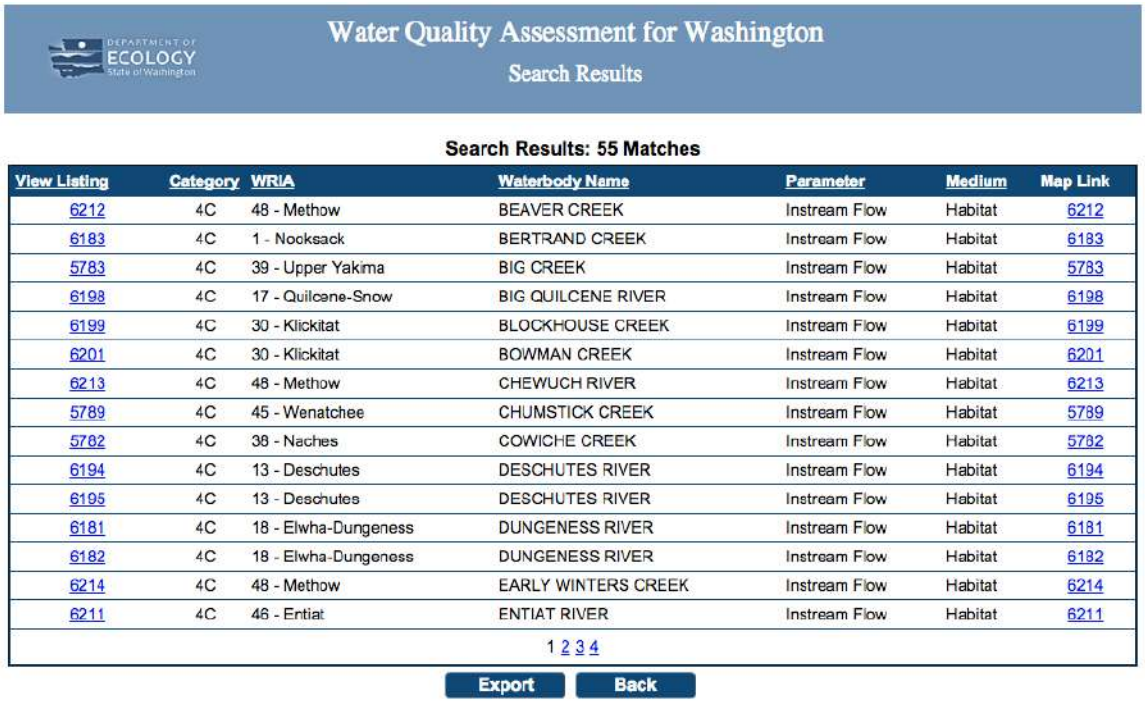
IX. Washington

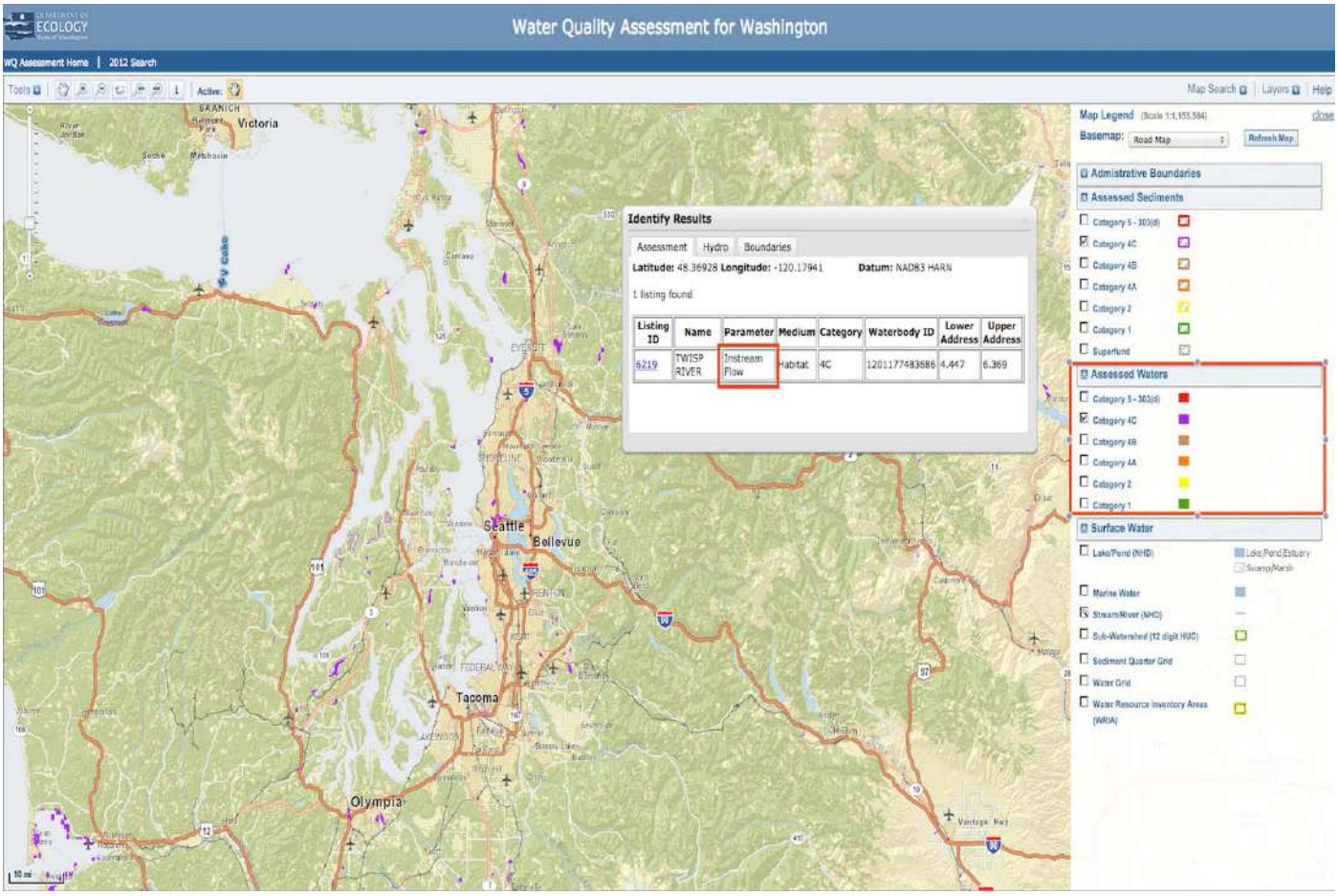




View Listing	Category	WRIA	Waterbody Name	Parameter	Medium	Map Link
6212	4C	48 - Methow	BEAVER CREEK	Instream Flow	Habitat	6212
6183	4C	1 - Nooksack	BERTRAND CREEK	Instream Flow	Habitat	6183
5783	4C	39 - Upper Yakima	BIG CREEK	Instream Flow	Habitat	5783
6198	4C	17 - Quilcene-Snow	BIG QUILCENE RIVER	Instream Flow	Habitat	6198
6199	4C	30 - Klickitat	BLOCKHOUSE CREEK	Instream Flow	Habitat	6199
6201	4C	30 - Klickitat	BOWMAN CREEK	Instream Flow	Habitat	6201
6213	4C	48 - Methow	CHEWUCH RIVER	Instream Flow	Habitat	6213
5789	4C	45 - Wenatchee	CHUMSTICK CREEK	Instream Flow	Habitat	5789
5782	4C	38 - Naches	COWICHE CREEK	Instream Flow	Habitat	5782
6194	4C	13 - Deschutes	DESCHUTES RIVER	Instream Flow	Habitat	6194
6195	4C	13 - Deschutes	DESCHUTES RIVER	Instream Flow	Habitat	6195
6181	4C	18 - Elwha-Dungeness	DUNGENESS RIVER	Instream Flow	Habitat	6181
6182	4C	18 - Elwha-Dungeness	DUNGENESS RIVER	Instream Flow	Habitat	6182
6214	4C	48 - Methow	EARLY WINTERS CREEK	Instream Flow	Habitat	6214
6211	4C	46 - Entiat	ENTIAT RIVER	Instream Flow	Habitat	6211

1 2 3 4

Source: Washington State Department of Ecology, "Water Quality Assessment for Washington - 303(d)/305(b) Integrated Report Viewer," at: apps.ecy.wa.gov/wats/Default.aspx.



Source: Washington State Department of Ecology, "Water Quality Assessment for Washington," at: https://fortress.wa.gov/ecy/wqamapviewer/default.aspx?res=1920x1200.

X. Wyoming

Table 9.1.2. Ranked summary statistics for the causes and sources of impairment for Wyoming's streams, including both Category 4 and Category 5 (2012 303(d) List) waters.

Causes and Sources of Wyoming's Impaired Streams			
Causes	**Miles**	**Sources**	**Miles**
E. Coli/Fecal Coliform	950	Unknown	1,166
Selenium	358	Natural Sources	477
Sediment	270	Livestock Grazing	389
Habitat Modification	176	Wildlife Grazing	18
Arsenic	120	Irrigated Crop Production	306
Chloride	99	Petroleum Production	170
Temperature	89	Municipal Stormwater	45
Manganese	64	Habitat Modification	54
Oil and Grease	47	Hardrock Mining	17
Flow Alterations	46	Municipal WWTPs	10
Ammonia	17	Hardrock Mining in MT	7
Copper	17		
Cadmium	12		
Silver	12		
pH	10		

9.4 Category 4 Surface Waters

Table 9.4. Table of Wyoming's surface waters which are impaired or threatened for a designated use and either a TMDL has been completed and approved by USEPA (4A); other pollution control measures are expected to address the impairment (4B); or pollution, not a pollutant is the source of impairment (4C). All category 4A waterbodies are hyperlinked to their respective TMDLs.

Bighorn River Basin

Waterbody	305(b) Identifier	Location	Class/Category	Miles/Acres	Cause(s) of Impairment
Ocean Lake	WYBH100800050202_01	Within the Ocean Lake Wildlife Management Area	2ABww/4A	6075.8 ac.	Sediment
Grass Creek	WYBH100800070608_01	From an irrigation withdrawal in NENE S23 T46N R99W to a point 14.1 miles upstream	2AB/4C	14.1 mi.	Flow Alterations
Crooked Creek	WYBH100800100500_01	From the confluence with Bighorn Lake to a point 7.9 miles upstream	2AB/4C	7.9 mi.	Flow Alterations

North Platte River Basin

Waterbody	305(b) Identifier	Location	Class/Category	Miles/Acres	Cause(s) of Impairment
Horseshoe Creek	WYNP101800080905_03	From the confluence with Spring Creek to a point 7.3 miles downstream	2AB/4C	7.3 mi.	Flow Alterations

Little Snake River Basin

Waterbody	305(b) Identifier	Location	Class/Category	Miles/Acres	Cause(s) of Impairment
Haggarty Creek	WYLS140500030109_01	From the Ferris-Haggarty Mine downstream to the confluence with West Fork Battle Creek	2AB	5.6 mi.	Cadmium

Source: Wyoming Department of Environmental Quality, "2012 Integrated 305(b) and 303(d) Report," at: http://deq.state.wy.us/wqd/watershed/Program%20Documents/5.%20Water%20Quality%20Assessments%20&%20Integrated%20Report/Guidance/WY2012IR.pdf. (*Note*: There are more examples of 4c listings for flow alterations in the 2012 Integrated Reports' list of Category 4 Surface Waters.)

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