



May 15, 2013

Felicia Marcus, Chair, and Board Members
State Water Resources Control Board
1001 I Street
Sacramento, CA 95814
Via Electronic Mail

Re: Inclusion of Impairments Due to Low Flow in the California 2012 Section 303(d) List

Dear Chair Marcus and State Water Board Members:

Thank you for your attention and inquiry into the identification and Section 303(d) listing of water bodies threatened or impaired by alterations in natural flow. In brief, we urge the Board to take action to list water bodies threatened or impaired by altered flow in the state's 2012 Section 303(d) list, in either Categories 4C or 5. As discussed in detail in our joint 2010 Scoping Comments for the 2012 list,¹ and the subsequent comment letter² to the State Water Resources Control Board for the August 2012 informational item on this matter, such listings are required by the Clean Water Act, and are an important precursor to further action under existing and future laws and policies to prevent further degradation and ensure the long-term health of the state's waterways.

For your information in assessing these listings, we have compiled in this letter a brief summary of some of the key benefits of such listings. Among other benefits, the listings are essential in that they would provide support for actions that prevent further diversions or other practices that reduce flows in already-impaired waterways. These benefits have already been recognized by other states, who are already well into programs for listing and addressing waterways impaired by altered flow. We attach a summary of such efforts in other states, which provides both background information and staff contact data that could be used by the State Water Board in support of a similar listing initiative.

While the Clean Water Act mandates listing of all waterways impaired by altered flow, we attach a shortlist of severely flow-impaired waterways that would be a solid starting point for a similar 303(d) effort for flows in California. Starting with a subset of waterways are so clearly flow impaired, based on a wide variety of existing data, will make 303(d) listings straightforward to support, and will reduce Board staff resources associated with identifying new listings. We would welcome the opportunity to add additional flow-impaired waterways to this list for your consideration, as detailed in the above-cited comment letters.

¹ Available at: [http://www.cacoastkeeper.org/document/ccka-comments-on-2012-303\(d\)-list.pdf](http://www.cacoastkeeper.org/document/ccka-comments-on-2012-303(d)-list.pdf) (see in particular pages 11-24).

² Available at: http://earthlawcenter.org/static/uploads/documents/Flows_hearing_Aug_2012_1.pdf.

We urge the State Water Board to review these and other flow-impaired waters for inclusion on the state's 2012 303(d) list in Category 4C or 5. If an informational hearing is needed to gather more information and support for this action, we also request that the Board notice and hold this hearing expeditiously.

Benefits of 303(d) Listing of Flow-Impaired Waterways

1. The Clean Water Act Mandates Identification of Flow-Impaired Waterways on Its 303(d) List

As discussed in more detail in the comment letters referenced above, and reinforced in the state's Listing Policy,³ Section 303(d)(1)(A) of the Clean Water Act requires states to identify waters for which effluent limitations for specified point sources are not stringent enough after implementation of technology-based controls to implement water quality standards applicable to those waters. In other words, if a water body's standards are not being met in the water body, then it *must* be listed in the state's Section 303(d) list.

Water segments impaired by altered flows at a minimum⁴ should be placed in Category 4C, which houses water segments "impaired or affected by non-pollutant related [*e.g.*, "pollution"] cause(s)." Such placement is consistent with the U.S. EPA's 2006 Guidance⁵ and will ensure that the waterways appropriately are included on the state's 303(d) list, which in turn will highlight the need for swift action to restore altered flows. Numerous water bodies throughout the state face significant flow impairments, and in many of these, endangered fish and other aquatic species may disappear in our lifetimes. As discussed in more detail below, there is more than enough evidence to list at least several such water bodies that are incontrovertibly impaired by altered flows.

Listing of flow-impaired waterways is a separate and distinct task from determining whether or not total maximum daily loads (TMDLs) are required to address those impairments, as discussed in CWA Section 303(d)(1)(C). Even if TMDLs are not required to be completed for flow-listed waterways, listings for flow will likely precipitate otherwise unavailable flow-related commitments by stakeholders who specifically choose to come to the table because of the flow listings. As was seen in the challenges to the San Joaquin River salinity listing, even the potential for flow-related listings generates significant stakeholder interest that otherwise might not have occurred.

2. 303(d) Listings for Flow Provide Opportunities for Enhanced Funding to Support Restoration

It has been our direct experience (having personally advocated successfully in the state Legislature for funding for impaired waterways) that impaired waterways that are officially and accurately identified on the state's 303(d) list stand significantly higher chances of receiving financial resources for restoration than those not so identified. Conversely, if the State Water Board continues to fail to incorporate existing data that demonstrate serious flow problems, there is far less

³ SWRCB, "Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List" (Sept. 2004), p. 1, available at:

http://waterboards.ca.gov/water_issues/programs/tmdl/docs/ffed_303d_listingpolicy093004.pdf (Listing Policy).

⁴ As noted in the Scoping Comments, California's 303(d) list already includes a small number of waterway segments impaired by altered flows in Category 5.

⁵ 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), available at: <http://www.epa.gov/owow/tmdl/2006IRG/report/2006irg-report.pdf>.

likelihood of building the necessary political capital to achieve restoration funding for waterways requiring assistance.

Now is a particularly important time to act to identify flow-impaired waterways, as the state continues to debate several water bond bills that could be the last state water bond funding for some time.

3. 303(d) Listings for Flow Would Help Begin to Dissolve the False Dichotomy between Water Quality and Waterway Flows

It has been said several times by senior staff that there is a “firewall” between water quality and water flows, including with respect to funding, which in part prevents successful application of the Clean Water Act’s 303(d) mandate for flow listings. This is a false dichotomy in science, and need not occur in policy with attention to education and full application of the Clean Water Act. The health of waterways is inextricably linked to the level of contaminants and the volume, frequency, magnitude, timing, and duration of flows. The U.S. Supreme Court specifically weighed in on this matter, finding that “water quantity is closely related to water quality; a sufficient lowering of the water quantity in a body of water could destroy all of its designated uses, be it for drinking water, recreation, navigation, or . . . a fishery.”⁶ The U.S. Supreme Court further stated unequivocally any distinction between water quality and quantity under the CWA is “artificial.”⁷

The U.S. Supreme Court specifically took note of CWA Sections 101(g) and 510(2), which address state authority over the allocation of water as between users. The Court found that these provisions “do not limit the scope of water pollution controls that may be imposed on users who have obtained, pursuant to state law, a water allocation.” This conclusion is supported by the “except as expressly provided in this Act” language of Section 510(2), which conditions state water authority; and by the legislative history of Section 101(g), which allows for impacts to individual water rights as a result of state action under the CWA when “prompted by legitimate and necessary water quality considerations.”⁸ Other states and U.S. EPA Regions have already embraced this direction and protected aquatic beneficial uses through actions that impact flows, as discussed in the attachment.

Listing of waterways impaired by altered flows is not only supported by the Clean Water Act and the U.S. Supreme Court – it also could provide the opening needed for the State Water Board to develop future, holistic regulatory strategies that more effectively ensure the long-term well-being of the state’s waterway. For example, the Board could begin consideration of a more holistic and streamlined system of water governance that considers both water flows and water quality together in addressing waterway health. Under such a system, regulators could conceivably

⁶ *PUD No.1 v. Washington Department of Ecology*, 511 U.S. 700, 719 (May 31, 1994).

⁷ *Id.*

⁸ *Id.* at 720 (“See 3 Legislative History of the Clean Water Act of 1977 (Committee Print compiled for the Committee on Environment and Public Works by the Library of Congress), Ser. No. 95–14, p. 532 (1978) (“The requirements [of the Act] may incidentally affect individual water rights. . . . It is not the purpose of this amendment to prohibit those incidental effects. It is the purpose of this amendment to insure that State allocation systems are not subverted, and that effects on individual rights, if any, are prompted by legitimate and necessary water quality considerations”).” See also Memorandum from U.S. EPA Water and Waste Management and General Counsel to U.S. EPA Regional Administrators, “State Authority to Allocate Water Quantities – Section 101(g) of the Clean Water Act” (Nov. 7, 1978), available at: http://water.epa.gov/scitech/swguidance/standards/upload/1999_11_03_standards_waterquantities.pdf.

adjust water rights and/or water pollutant discharge requirements within the same regulatory process, depending on the needs of the waterway, its inhabitants, and its users, rather than in a piecemeal manner that fails to reflect the environment as the system that it is.

4. 303(d) Listings for Flow Would Provide Support in State Water Board Waste and Unreasonable Use, Public Trust Doctrine, and other Water Flow-Related Hearings

In addition to ensuring compliance with federal law, another benefit of listing waterways impaired by altered flows is to provide support for current and future State Water Board hearings related to water rights and flows. These may include waste and unreasonable use hearings,⁹ public trust doctrine applications, FERC relicensings, dam removals, new water diversion applications,¹⁰ reopening of existing water rights permits, environmental review of water transfers, and other flow-related actions. Formal U.S. EPA adoption of state flow impairment listings will help ease any burden of proof needed in such matters, to the benefit of the impaired waterway.

5. 303(d) Listings for Flow Would Provide Support in Local Land Use and Planning Decisions

Flow listings also lend support at the local level, in addition to state proceedings. For example, CEQA review of local land use and planning activities and processes would need to reference 303(d) listings for flows, and so could prevent worsening of waterway conditions. CEQA reviews could do this by, among other things, requiring local decisionmakers to consider and potentially adopt more protective alternatives and/or mitigation measures to favored projects that would further impact flows in impaired waterways.

6. 303(d) Listings for Flow Would Support Improved Statewide Assessment of Waterway Threats, with Accompanying Increased Efficiencies in Waterway Protection and Restoration

The USGS reports that hydrologic alteration is the primary threat to waterways nationwide, but that data is lost in California, which does not track flow impairments. Instead, low flow-related pollutants such as temperature, bacteria and sediments appear to be top impairments, when in fact the chief culprit impairing the waterways' beneficial uses may be flow. California currently had no readily accessible, statewide database of the challenges waterways face with respect to reduced flows. This significant gap could begin to be corrected with a comprehensive 303(d) flow listing database.

Actions in Other States to List Waterways Impaired by Altered Flows

The many benefits of listing waters as impaired by flow have already been recognized by other states, who are already well into programs for listing and addressing waterways impaired by altered flow. As of the August 2012 informational hearing on this matter, U.S. EPA had compiled nationwide data showing that 50,660 miles of rivers and streams, 548,980 acres of lakes, reservoirs and ponds, 299 square miles of bays and estuaries, and 32,660 acres of wetlands nationwide have

⁹ See, e.g.,

http://www.waterboards.ca.gov/board_info/agendas/2011/jan/011911_12_reasonableusedoctrine_v010611.pdf

¹⁰ For example, Santa Barbara Channelkeeper reports that even though the Ventura River is over-allocated, new water rights permits are still being written for it.

already been listed on states' 303(d) lists as impaired by flow alterations.¹¹ This corresponds to listings for at least 136 water body segments nationwide in states including Idaho, Michigan, Montana, Ohio, Tennessee, Wyoming, and even California.¹² Additional listings are likely to have been approved since then as states complete their 2012 listing cycles.

We provided to State Water Board members and senior staff last fall the attached summary of the details of listing process in other states, including staff contact information and the processes that each state has used to identify flow-impaired waterways. This summary provides invaluable information to State Water Board staff investigating the mechanics of a similar listing process here in California. We urge staff to reach out to their colleagues in other states on this matter; we have personally found them to be more than happy to discuss their work.

We have also provided to the State Water Board in a separate context a summary of these and other states' use of the Clean Water Act to address flow issues more generally (*i.e.*, outside of 303(d) listings), including memoranda by U.S. EPA Regions 1 and 4 in support of the application of the Clean Water Act to flows.¹³ This analysis provides further support for State Water Board members and senior staff to seek compliance with the Clean Water Act through listing of flow-impaired waterways in California. If staff contacts at these EPA Regions are desired, we would be pleased to provide them.

Shortlist of California Waterways Severely Impaired by Altered Flows

Senior staff and Board members have indicated that listing should be done to solve a problem. As described above, there are numerous benefits to listing that will together help solve the state's undeniable problem with flow-impaired waterways. This is most particularly true for the "shortlist" waterways described in the enclosed attachment, which are as follows:

Scott River, Shasta River, Eel River, Mattole River, Napa River, Mark West Creek, San Joaquin River (inflow to the Delta), San Francisco Bay-Delta (outflow to Suisun Bay and San Francisco Bay), Salinas River, and Santa Clara River.

Listing these flow-impaired waterways on the 2012 Section 303(d) list will provide help to these waters immediately, at a minimum in terms of preventing existing problems from worsening until staff time and attention can be focused on them. Without the listings, many of the waterways will have to wait many years, as is currently projected with a number of the ongoing public trust doctrine and flow criteria/objective processes. For example, Board staff informed assembled North Coast advocates that water rights staff who had ostensibly been allocated to the North Coast had

¹¹ See U.S. EPA, "Specific State Causes of Impairment That Make Up the National Flow Alteration(s) Cause of Impairment Group," available at: http://iaspub.epa.gov/tmdl_waters10/attains_nation_cy.cause_detail?p_cause_group_name=FLOW%20ALTERATION%28S%29. See also details of flow impairment listings at U.S. EPA, "Impaired Waters, Cause of Impairment Group: Flow Alteration(s)," available at:

http://iaspub.epa.gov/tmdl_waters10/attains_impaired_waters.control?p_cause_group_id=545.

¹² See U.S. EPA, "Watershed Assessment, Tracking and Environmental Results: Specific State Causes of Impairment That Make Up the National Flow Alteration(s) Cause of Impairment Group," available at: http://iaspub.epa.gov/tmdl_waters10/attains_nation_cy.cause_detail_303d?p_cause_group_id=545.

¹³ Letter from Earth Law Center to SWRCB, "Comments on Bay-Delta Plan SED" (March 2013), Attachments, available at: http://earthlawcenter.org/static/uploads/documents/Bay-Delta_Plan_Comments_2.pdf.

been refocused on the Delta, with a potential date of 2018 before they could be reallocated back to the North Coast. Listing waterways as flow impaired now will bring much-needed interim relief to prevent further degradation, and potentially bring stakeholders to the table who otherwise would have sidelined themselves until state staff refocuses their attention.

Finally, the question has been raised to us with regard to listing waterways impaired by altered flow where there are no adopted flow criteria, with the suggestion that the state wait on listing until such criteria are adopted. For the waterways listed in the attachment, this is not an issue, as their flow is so low (for some, down to zero for a significant portion of the year) that impairments are clear. Numerous beneficial uses throughout the state imply a certain amount of flows to support that use – including aquatic habitat, fisheries, endangered species protection, and many others. If these uses are impaired, and flows are part of the problem (which is certainly the case for the waterways in the attachment), the waterways must be listed for altered flow. This is particularly true for water bodies for which instream flow needs have already been scientifically determined by agency processes, such as by the State Water Board in its August 2010 report on the Bay-Delta process,¹⁴ by the Department of Fish and Wildlife,¹⁵ and by the state’s Ocean Protection Council,¹⁶ among others.

Listing of the above “shortlist” waterways is required by the Clean Water Act and consistent with California’s Section 303(d) Listing Policy, which requires identification of waters for which effluent limitations for specified point sources are not stringent enough after implementation of technology-based controls to implement water quality standards applicable to those waters.¹⁷ The Listing Policy reinforces that “RWQCBs and SWRCB shall actively solicit, assemble, and consider all readily available data and information,” including “submittals resulting from the solicitation, selected data possessed by the RWQCBs, and other sources.”¹⁸ The Listing Policy adds that, “[a]t a minimum, readily available data and information includes . . . [d]ilution calculations, trend analyses, or predictive models for assessing the *physical*, chemical, or biological condition of streams, rivers, lakes, reservoirs, estuaries, coastal lagoons, or the ocean”¹⁹ In other words, physical conditions such as flow are specifically contemplated in the Listing Policy.

Further the Listing Policy includes “listing factors” for which “[w]ater segments shall be placed on the section 303(d) list.”²⁰ Factors include pollutant-related violations of standards, including pollutants that have been concentrated to levels that violate standards as a result of low flows. Adding flows to the 303(d) list for such segments complements the listing of such pollutants, and provides important and necessary information about the nature of the impairments at issue. Moreover, even where there are no pollutant listings for waterways impaired by altered flows, the Listing Policy still contemplates listing of flow-impaired waterways. Specifically, it states that:

When all other Listing Factors do not result in the listing of a water segment but information indicates non-attainment of standards, a water segment shall be evaluated to determine

¹⁴ Available at:

http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/deltaflow/docs/final_rpt080310.pdf.

¹⁵ See http://www.dfg.ca.gov/water/instream_flow.html.

¹⁶ See Instream Flow Analysis projects at: <http://www.opc.ca.gov/category/projectsbytopic/>.

¹⁷ Listing Policy at 1.

¹⁸ *Id.* at 17 (emphasis in original).

¹⁹ *Id.* (emphasis added).

²⁰ *Id.* at 4.

whether the weight of evidence demonstrates that a water quality standard is not attained. If the weight of evidence indicates non-attainment, the water segment shall be placed on the section 303(d) list.²¹

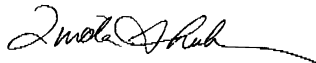
That is, where beneficial uses are impaired due to altered flows, “the water segment shall be placed on the 303(d) list,” regardless of whether TMDLs are required to be developed. The numerous other benefits of listing flow-impaired waterways, as described above, demonstrates that full compliance with the federal Clean Water Act will prevent further harm to already flow-impaired waterways and lead to improvements in their health.

* * *

Our laws and policies reflect our priorities as a society. To survive and flourish in the face of increasing pressures on the state’s water system, California must adopt and implement laws and policies that reflect the simple fact that we must learn to live within our water means. Identification of waterways threatened or impaired by altered flows (as required by the Clean Water Act) is the first, and critical, step in this process. Such formal identification will recognize the impacts of our flawed water use practices, help advance implementation of holistic governance tools, and assist with the evolution of needed governance alternatives.

For the reasons described above, we urge the State Water Board to take action now to begin listing waterways impaired by altered flows. We stand ready to assist with this critical effort, along with a vibrant coalition of fishing groups, watershed groups, scientists, tribes and community members. Thank you.

Sincerely,



Linda Sheehan
Executive Director
Earth Law Center
lsheehan@earthlaw.org



Sara Aminzadeh
Executive Director
California Coastkeeper Alliance
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Attachment 1 – *Summary of flow listing efforts in other states, provided Fall 2012*

Attachment 2 – *Detailed “shortlist” of flow-impaired waters*

²¹ *Id.* at 8.

ATTACHMENT 1

303(d) Listings for Flow in States Other Than California (Fall 2012)

U.S. EPA has compiled nationwide data showing that 50,660 miles of rivers and streams, 548,980 acres of lakes, reservoirs and ponds, 299 square miles of bays and estuaries, and 32,660 acres of wetlands nationwide have already been listed on states' 303(d) lists as impaired by flow alterations.²² These listings span multiple states nationwide, and include California.²³

The data on each state with a listing program for altered flows is provided below. Messages have gone out to the contacts in each of the states below with regard to exactly how they identify waterways impaired by altered flow for listings.

Phone conversations have already occurred with Ohio, Tennessee, Michigan, Wyoming and Idaho.

Both **Ohio** and **Tennessee** use biological criteria to raise a red flag on flows, and then look more deeply to see if flows are a problem for flagged waterways (especially where there are dams). If so, then altered flow is listed as a "cause" of the impairment in the flagged waterway segments. Tennessee also has a narrative flow criterion that they apply. Note in particular that the Tennessee contact volunteered that "**our job is to recognize impairment,**" even where they cannot act on it, such as is the case for irrigated agriculture under TN state law. This is one of the key messages of the 2010 Scoping Comments to the State Water Board - *i.e.*, altered flow listings must be made if the impairment exists, regardless of the next steps.

In **Wyoming**, most listings start with identification of higher sediment levels than would be expected (because flow moves sediment). Listings in both states are on a case-by-case basis with no formal adopted process.

A similar process is followed in **Idaho**, where most listings start with identification of sediment or temperature issues, which are then followed by examination of structural issues. While Idaho also does not have a formal process and instead uses case-by-case determinations, it also uses US EPA Assessment Database definitions of flow-related impairment "causes" in the categories of: low flow alterations, other flow regime alterations, physical substrate habitat alterations, and high flow regimes.

By contrast, **Michigan** focuses on listing waterways as impaired by altered flows where they see channelization and drain/ditch issues, as described in more detailed below.

An email exchange that occurred with **Vermont** is summarized below as well; their listing methodology attached separately.

²² See U.S. EPA, "Specific State Causes of Impairment That Make Up the National Flow Alteration(s) Cause of Impairment Group," available at: http://iaspub.epa.gov/tmdl_waters10/attains_nation_cy.cause_detail?p_cause_group_name=FLOW%20ALTERATION%28S%29. See also details of flow impairment listings at U.S. EPA, "Impaired Waters, Cause of Impairment Group: Flow Alteration(s)," available at:

http://iaspub.epa.gov/tmdl_waters10/attains_impaired_waters.control?p_cause_group_id=545.

²³ See http://www.waterboards.ca.gov/water_issues/programs/tmdl/docs/303dlists2006/epa/r4_06_303d_reqtmlds.pdf (showing listings caused by "pumping" and "water diversion" in Ventura River Reaches 3 and 4, and by "hydromodification" and "tidal flushing" in Ballona Creek Wetlands). See also U.S. EPA, "Watershed Assessment, Tracking and Environmental Results: Specific State Causes of Impairment That Make Up the National Flow Alteration(s) Cause of Impairment Group," available at:

http://iaspub.epa.gov/tmdl_waters10/attains_nation_cy.cause_detail_303d?p_cause_group_id=545.

This memo will be updated as additional conversations are had. Contacts are provided in the event State Board staff wish to reach out personally. Finally, please note that (as referenced below under TN) there is a **US EPA Region 4 water quality standards meeting** in Atlanta **August 28th-30th** that includes a discussion of a **narrative flow criterion** for listing purposes (such as is used in Tennessee).

Idaho

5485 river/stream miles, 85,729 lakes/reservoirs/ponds acres – http://ofmpub.epa.gov/waters10/attains_state.control?p_state=ID

The State of Idaho is currently listing for flow alteration in their Integrated Report. Idaho references the data relevant to the water body listed in their fact sheets as “data showed that flow is altered, *i.e.* many of man’s activities in the lower watershed contribute to degradation of flow and habitat condition.”

“Category 4C: Water bodies impaired by pollution (*e.g.*, flow alteration and habitat alteration) but not pollutants. According to EPA, water bodies impaired by pollution do not require development of a TMDL.” - <http://www.deq.idaho.gov/media/725927-2010-integrated-report.pdf>

“Category 4C—Waters of the State Not Impaired by a Pollutant

Impaired water bodies are placed in Category 4c if the impairment is not caused by a pollutant but rather caused by pollution, such as flow alteration or habitat alteration. Water bodies placed in Category 4c do not require the development of a TMDL. (For additional information on the differences between pollutants and pollution, see “Pollutants” and “Pollution,” page 13). The number of unique AUs currently listed in Category 4c is 408 out of 5,746 total AUs statewide. There are 7,155 miles of rivers and 85,729 acres of freshwater lakes that are impaired by pollution but not by a pollutant. The list of Category 4c AUs can be viewed in Appendix I.”

Nicole – Idaho relies in part on how US EPA defines impairment “causes” in EPA’s Assessment Database (ADB). There are four flow-related “causes” of impairment: low flow alteration, other flow regime alterations, high flow alterations, and physical substrate/habitat alterations. They are defined as follows in US EPA’s ADB:

CAUSE NAME	CAUSE DESCRIPTION
Low Flow Alterations	Low flow alterations (anthropogenic sources, e.g., diversions or subsurface drainage). Federal Interagency Stream Restoration Working Group (ISRWG). 1998 (Updated 2001). Stream Corridor Restoration: Principles, Processes, and Practices. By the Federal Interagency Stream Restoration Working Group (FISRWG)(15 Federal agencies of the US gov't). GPO Item No. 0120-A; SuDocs No. A 57.6/2:EN 3/PT.653
Other Flow Regime Alterations	Other flow regime alterations (anthropogenic sources, e.g., decrease in flood pulses due to hydrostructures). Federal Interagency Stream Restoration Working Group (ISRWG). 1998 (Updated 2001). Stream Corridor Restoration: Principles, Processes, and Practices. By the Federal Interagency Stream Restoration Working Group (FISRWG)(15 Federal agencies of the US gov't). GPO Item No. 0120-A; SuDocs No. A 57.6/2:EN 3/PT.653
Physical Substrate Habitat Alterations	Physical substrate habitat alterations (e.g., fines embedding cobbles). Federal Interagency Stream Restoration Working Group (ISRWG). 1998 (Updated 2001). Stream Corridor Restoration: Principles, Processes, and Practices. By the Federal Interagency Stream Restoration Working Group (FISRWG)(15 Federal agencies of the US gov't). GPO

High Flow Regime High Flow Regime

Impairments related to flows usually are associated with some type of structure. Idaho staff evaluate what is going on in an area before they decide to list (i.e., “is there a dam,” etc.). Almost all of the AUs impaired for flow are also impaired by other, pollutant causes (such as sediment) for which the TMDLs are developed. E.g., if staff find temperature elevations in an AU right below a dam, they also look at the structure of the dam, where the water is being released, etc. (Staff states that flow and habitat alteration are often co-existent with pollutants amenable to TMDLs.) Out of 408 unique AUs, 9.1% are Category 4C (flow or habitat) only; i.e. are not listed in any other categories (e.g. no pollutants identified). There is no formal state guidance on listing under Category 4C; it is case-by-case, usually triggered by initial sediment or temperature issues (as is the case for some other states).

Contact: Nicole Deinarowicz, (208) 373-0591, nicole.deinarowicz@deq.idaho.gov

Michigan

9 river/stream segments listed for flow alteration as a cause of impairment (2008) - http://ofmpub.epa.gov/waters10/attains_state.report_control?p_state=MI&p_cycle=2008&p_report_type=T

2012 draft 303(d) list to US EPA – “Category 4c: Impairment is not caused by a pollutant (e.g., impairment is due to lack of flow or stream channelization).” - http://www.michigan.gov/documents/deq/wrd-swas-draft-2012IR_370366_7.pdf. See “Table 9.7 Michigan river and stream miles not supporting designated uses listed by cause of impairment” - 3,529 river miles listed for flow alteration as a cause of impairment

The Michigan Legislature passed Public Act 33 in 2006. This is the first Michigan state law to regulate water withdrawal. The objective of this Act was to prevent any large withdrawal (generally referring to withdrawal that average more than 100,000 gallon of water (0.1547 ft³/s) in any consecutive 30- day period] from causing an adverse resources impact. The median streamflow for the summer month of lowest flow was specified by state decision makers as the index flow on which likely impacts of withdrawals would be assessed. At sites near long-term streamflow-gauging stations, analysis of streamflow records during July, August, and September was used to determine the index flow. At ungauged sites, an alternate method for computing the index flow is based on a regression model that computes the index water yield, which is the index flow divided by the drainage area. The Michigan Department of Environmental Quality listed 7,000 miles of rivers and streams for flow alteration on the 2008 303(d) list based on these criteria. A formal process to improve the flow in these water bodies has yet to be implemented.

Kevin Goodwin – Reports in phone call that Michigan does not have a specific listing process for waters impaired by altered flow. He states that the vast majority of the listings are related to maintained drains/ditches/channels (agricultural and others). If staff sees channelization, they look for altered flows. He said that there are some altered flow listings related to urban stormwater, but most are associated with maintained drains and ditches.

Contacts: Kevin Goodwin with Michigan DEQ (517-335-4185, goodwink@michigan.gov)
Surface Water Assessment Section, Water Resources Division

Montana

6530 river/stream miles, 20,034 lakes/reservoirs/ponds acres listed for flow alteration as a cause of impairment -

http://ofmpub.epa.gov/tmdl_waters10/attains_index.control?p_area=MT#total_assessed_waters

“A large percent of Montana waters fall within the pollution category, i.e., Category 4C. Typically, water quality restoration plans include both TMDLs for pollutant-caused impairments and restoration goals and objectives for pollution-caused impairments. This allows DEQ to identify and recommend improvements that address all impairment causes within a watershed.” Integrated Report: http://cwaic.mt.gov/wq_reps.aspx?yr=2010qryId=76990

Contact: 406-444-3409

Ohio

85 water body segments for which flow alteration is listed as a cause of impairment:

http://ofmpub.epa.gov/waters10/attains_state.report_control?p_state=OH&p_cycle=2008&p_report_type=T

Final 2012 report: <http://www.epa.ohio.gov/dsw/tmdl/2012IntReport/index.aspx>

Beth Risley: Ohio identifies impaired waters based on biology; they have adopted criteria for various biological communities. If sampling shows that the communities are not meeting these goals, they then identify causes and sources of impairment (e.g. if they see dams, they have a long history of evidence of dams impairing biology and so they will list for flow alteration). The listing process itself for aquatic life use is available in Section G of the 2012 Integrated Report:

<http://www.epa.ohio.gov/portals/35/tmdl/2012IntReport/IR12SectionGfinal.pdf>. There is also an overview of the biological assessment process here:

<http://www.epa.ohio.gov/dsw/bioassess/ohstrat.aspx>. That page also goes into the overall approach in Ohio. (Note that Ohio EPA is in the process of updating its web pages and there may be some significant changes in early September. All links will be redirected to appropriate pages, but these particular links may no longer be active; contact Beth if not.)

Contact: Beth Risley, TMDL Coordination
Ohio EPA, Division of Surface Water
beth.risley@epa.state.oh.us, (614) 728-2384

Tennessee

Flow alterations as cause of impairment – 453 miles rivers/streams, 11,444 acres of lakes/reservoirs/ponds - http://ofmpub.epa.gov/waters10/attains_state.control?p_state=TN

Draft 2012 list: http://www.tn.gov/environment/wpc/publications/pdf/2012_draft_303d_list.pdf - “As with the 2010 list, Tennessee has used Category 4C for segments impacted by flow alteration”

Greg Denton – Tennessee bases the listing assessment on their **narrative flow criterion**, which gives TN the authority to consider flow as an impairment. **The criterion states that “flows shall support the beneficial uses.”** The state has used this since the mid-90s roughly, and has decided against a more specific numeric formula or criterion. Greg states that U.S. EPA is supportive of TN’s approach and talking about a similar criterion to be adopted in the other

Southern states; in fact, **there is a water quality standards meeting in Atlanta August 28th-30th that includes this flow criterion on the Agenda.**

Greg states that they start the process with their biological surveys; if the stream fails the biologic criteria, then they look at data as to causes and sources. They especially look carefully below dams, and if it looks as the waterway has been impaired by dam, it is listed as flow impaired. TN does habitat surveys at the same time as the biologic surveys, and they also look for signs that the flow is low in these surveys. Dams are not the only source of flow-caused impairments though; he states that agricultural diversions of water can pump stream dry and the state doesn't have recourse due to an irrigated agriculture exemption in their state agricultural code (just downstream neighbors have recourse, through a lawsuit. Greg states specifically that **"Our job is to recognize impairment,"** so they list as flow impaired even if they cannot act against the farmers.

Contact: Greg Denton, (615) 532-0699

Vermont²⁴

Integrated Report: http://www.vtwaterquality.org/mapp/docs/305b/mp_305b-2012.pdf - "In Vermont, so-called altered waters are those where water quality impairments exist due to non-pollutants. These occur on the Vermont Parts E, F, and G lists (exotic species, **flow**, and geomorphic alteration, respectively), and **all are analogous to EPA 'Category 4C.'** This report also provides a tabular assessment of waters by EPA reporting category." The most recent statewide water quality assessment indicates that biological condition does not meet water quality standards in over 6,000 acres of lake waters (~11% of inland lake acres) due to flow alteration, while a further 4,400 acres exhibit stress. For streams, the biological condition fails to meet water quality standards in over 210 miles (~4% of biologically assessed streams) due to flow alteration, while a further 70 miles exhibit stress.

Cathy Kashanski: "Below is a link to our water quality standards where on pages 24 – 26 particularly we address hydrology.

http://www.anr.state.vt.us/dec/waterq/erp/docs/erp_wqs.pdf

Attached [separately] is our Assessment and Listing Methodology that describes where flow is used in judging support or not of a designated use in surface waters.

If you have questions after looking at these, you can give me a call or you could also call Brian Fitzgerald of our Streamflow Protection Section. Essentially each two year period, we ask Brian to review the F List and update it so his knowledge is where the rubber meets the road in terms of determining flow alteration (read 'impairment but not by a pollutant')."

Contacts: Cathy Kashanski, (802) 338-4843, cathy.kashanski@state.vt.us
Brian Fitzgerald, 802-338-4852, brian.fitzgerald@state.vt.us

Washington

The Washington Department of Ecology listed 49 streams in 1998 under Section 303(d) because based on the information collected by other agencies flows were inadequate to support designated instream water uses such as fish. The streams listed in the 1998 303(d) list were moved to the

²⁴ "If there is no minimum flow requirement in place it is calculated on the basis of the 7Q10 flow value or at the absolute low flow value resulting from flow regulation, whichever is less, unless an alternative flow statistic is specified in their Water Quality rules."

http://water.epa.gov/scitech/swguidance/standards/wqslibrary/upload/2008_12_09_standards_wqslibrary_vt_vt_1_wqs.pdf.

new subcategory 4C (impaired by a non-pollutant) when the US EPA Guidance for preparing Integrated Report became available in 2004. These streams are generally expected to be addressed in the future through the establishment, protection and restoration of stream flows.

Wyoming

Waterways impaired by flow alterations are listed in Category 4C:

<http://deq.state.wy.us/wqd/watershed/Downloads/305b/2012/WY2012IR.pdf> (46 stream miles).

Examples:

“Tongue Sub-basin (HUC 10090101) – Monitoring by WDEQ (2009) on Soldier Creek spanning the years 1998-2003 showed that the aquatic life other than fish use is impaired from PK ditch downstream to the confluence with Goose Creek and supported from PK ditch upstream to the headwaters of the creek. Because the impairment is thought to be caused by flow alterations in the watershed, the segment was placed in category 4C in 2010 and a TMDL is not necessary.”

“Upper Big Horn Sub-basin (HUC 10080007) – WDEQ (2003, 2005) monitoring indicates that the aquatic life other than fish use is not supported in the upper Grass Creek watershed, a tributary to Cottonwood Creek. However, because this reach is impacted by flow alterations rather than a pollutant, it does not require a TMDL and has been placed in Category 4C.”

“Bighorn Lake Sub-basin (HUC 10080010) – Crooked Creek flows into Wyoming from Montana and then flows into Big Horn Lake. Monitoring by WDEQ (2005) shows that its aquatic life other than fish uses are fully supported from an irrigation diversion in SWNW Section 29, T58N, R95W upstream to the Montana state line. However, de-watering downstream of this diversion have impaired the aquatic life other than fish use, and this reach was been placed in Category 4C in 2005 (Waters where use(s) are not supported, but a TMDL is not necessary.”

“Glendo Sub-basin (HUC10180008) – habitat degradation and a lack of perennial flows from the confluence with Spring Creek downstream approximately 7.3 miles prevent Horseshoe Creek from supporting its aquatic life other than fish and cold water fisheries uses. The habitat degradation appears to be primarily related to changes in flow regime in this reach, but heavy livestock grazing in some areas may also contribute. As a result, Horseshoe Creek was added to Category 4C in 2004 and is impaired but does not require a TMDL.”

Richard Thorp – Reports in phone call that there is not a specific process for listing waters impaired by altered flows, and that the listings instead are on a case-by-case basis. He states that in many instances, the listings start with staff identifying higher sediment levels. In that situation, they look for dewatering (because flow moves sediment) and associated degree of flow alteration. They have water diversion data, and so they examine that to assess whether there is a significant enough problem with flow alteration to list (again, case-by-case determination of how much is enough). He reports that they have a high bar for data and weight of evidence requirements through its “credible data law,” which makes their listing decisions easier to defend.

Contact: Richard Thorp, Department of Environmental Quality, Water Quality Division (307)-777-3501, richard.thorp@wyo.gov

District of Columbia

9 water segments impaired by flow alterations (16.5 river/stream miles) -

http://ofmpub.epa.gov/tmdl_waters10/attains_index.control?p_area=DC

2012 Integrated Report – Table 3.7 -

<http://ddoe.dc.gov/sites/default/files/dc/sites/ddoe/publication/attachments/2012%20IR%206-19-2012.2.pdf>

Contact: Lucretia Brown, lucretia.brown@dc.gov

ATTACHMENT 2

Ten California Waterways Being Drained Dry

Using the Clean Water Act to Resuscitate Disappearing Waterways

In August 2010, environmental, tribal, and fishing groups submitted more than one thousand pages of detailed studies, data, and analysis to inform the Board's development of the 2012 Clean Water Act Section 303(d) List. As detailed in that letter, and at the August 2012 Water Board informational item on this matter, California is legally required to include on its Section 303(d) list *all* of the waterways for which "readily available" data indicate impairment, including impairments due to alterations in natural flow.

Other states have begun this essential task of identifying water bodies impaired by altered flows, with support by U.S. EPA. Within California, U.S. EPA's Bay Delta Action Planⁱ anticipates flow listings, noting that "identifying those impairments and identifying the cause (whether it is a "pollutant" for purposes of Section 303(d) or some other cause) is a critical part of the Clean Water Act response to the Estuary's problems."

Given California's current struggles with water, and the challenges to come with climate change, every tool must be used to prevent further damage and to restore degraded waterways to full health. California must begin a process of identifying and listing flow-impaired waterways in its 2012 303(d) list, as detailed in our 2010 scoping letter and the 2012 flows listing informational hearing.

To help begin this Board effort, we have developed a shortlist of waterways that are clearly and incontrovertibly impaired, and for which low flows are so clearly a cause that there are no reasonable arguments against their 303(d) listing for flow, in either Category 4C or 5. Preference was given in this initial shortlist to mainstem waterways as opposed to tributaries, as mainstem flow issues are more likely to impact entire watersheds and regions. At a minimum, these critically impaired waterways should be included on the draft 2012 303(d) List and released for public review at Regional and State Water Board hearings.

We worked closely with local groups to create this list based on the following criteria, among others:ⁱⁱ

- a. Significant data was submitted by August 2010 as part of the CWA 2012 303(d) scoping process, or is otherwise readily available (e.g., such as in government databases), and demonstrates altered flows such that impairment could not be dismissed as either naturally occurring or episodic.
- b. Local stakeholders are invested in the health of the waterway, and could inform and participate in restoration of the health of the listed waterway.
- c. Prior formal recognition of flow issues with the waterway by State Water Board, Department of Fish and Wildlife, or other state or local agencies.
- d. Ongoing or potential injury to threatened or endangered species.
- e. Waterways within the National or California Wild and Scenic River System, or Class I streams (habitat for fishery resources) or Class II streams (habitat for aquatic non-fish vertebrates and/or aquatic benthic macroinvertebrates).
- f. Waterways where listing would help prevent waste, unreasonable use or unreasonable method of use of water, or unreasonable diversion or method of diversion of water.

Listed from north to south, our proposed "top ten" candidates for which altered flow is a basis for listing on California's 2012 Section 303(d) List are as follows:

1. **Scott River** (Region 1) Sections of the Scott River are completely dewatered during summer months, while other sections are severely flow-impaired. Adjudicated water rights alone are sufficient to allow complete dewatering of the Scott River during the summer and early fall. In

addition, a shift from surface diversions, which are naturally self-limiting, to groundwater wells has made worse the apparent over-appropriation of water in the watershed.^{iii, iv}

2. **Shasta River** (Region 1) The hydrology of the Shasta River is strongly affected by surface water diversions, groundwater pumping, and Dwinnell Dam. Seven major diversion dams and numerous smaller structures located on the Shasta River substantially and rapidly reduce flows in the main stem when they are in operation. In addition, Dwinnell Dam, located at about river mile 40, has dramatically altered the flow regime in all seasons of the main stem river. During various times of the year, no water is released from Dwinnell Dam for fish in the Shasta River. These flow alterations have adversely affected salmonid populations in the river.^v
3. **Eel River** (Region 1) Historic land use, including pervasive logging and road construction that reduced shade, vastly increased sedimentation and altered hydrology and soils, is exacerbated in many areas by unregulated dry-season diversions related to marijuana cultivation. As a result, Eel River and its tributaries suffer from low flows that often produce temperatures lethal to listed fish species.^{vi}
4. **Mattole River** (Region 1) A detailed study of the Mattole River Basin found that lack of adequate late summer and early fall stream flow is recognized as one of the most important limitations on salmonid habitat in the Mattole River basin. In recent years, juvenile salmonids have become stranded in pools due to excessively low flows, causing mortality and necessitating fish rescue operations.^{vii}
5. **Mark West Creek** (Region 1) Ten years ago all 28 miles of Mark West Creek had water in the summer. Today, because of increased diversions, only approximately 3½ miles have water. Mark West Creek provides important habitat to steelhead trout and endangered coho salmon, whose populations are being adversely affected by elevated water temperatures.
6. **Napa River** (Region 2) Numerous studies referenced in the development of AB 2121 Instream Flow Guidelines for Northern Coastal Streams, among other places, illustrate the significantly degraded habitat of the Napa River, which can only be restored with a focus on reversing severely reduced natural flows.^{viii}
7. **San Joaquin River, inflow to the Delta** (Region 5)^{ix} The San Joaquin River was selected as a shortlist priority in light of the data contained in the proceedings being held on potential revisions to the Bay-Delta Water Quality Control Plan to increase flows from the San Joaquin River into the Delta. Current flows are wholly inadequate, as the state and federal wildlife agency, EPA, and NGO analyses show (as well as the SWRCB's own analyses and peer reviews).
8. **San Francisco Bay-Delta, outflow to Suisun Bay and San Francisco Bay** (Region 5) In addition to the above information, one of the key findings of the SWRCB's 2010 Public Trust flows report is that Delta outflow is significantly impaired, and that substantially greater outflow is needed to protect Public Trust fishery populations. This is especially true in the spring and fall months. Consideration should also be given to listing other portions of the Delta as flow-impaired, again in light of the data/information and agency processes described above.
9. **Salinas River** (Region 3) "Channel alteration and changes in flow regime have caused a virtual loss of the anadromous life history of three steelhead in the Salinas River." More generally, "flows in lower reaches for adult and juvenile steelhead passage are often lacking," with "[g]roundwater pumping related to agricultural activities . . . caus[ing] the loss of surface flow in winter and spring."^x This detailed analysis concluded that "unless the Salinas River channel and flow move back towards their more normal range of variability, steelhead cannot be restored."

10. Santa Clara River (Region 3) 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.^{xii} 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 habitat, degrade the ecological integrity of the River's estuary, and impair a plethora of cultural and recreational beneficial uses downstream.

Contacts for Additional Data & Information

(1) and (2): for Scott and Shasta River and other flow listings in the Klamath Basin, contact Konrad Fisher (konrad@klamathriver.org) at Klamath Riverkeeper or Craig Tucker (ctucker@karuk.us) with the Karuk Tribe.

(3): for Eel River listing, contact Zeke Grader (zgrader@ifrfish.org) with PCFFA, Darren Mierau (dmierau@caltrout.org) with CalTrout, or Scott Greacen (scott@eelriver.org) with Friends of the Eel River.

(4): for Mattole River listing, contact Brian Johnson (bjohnson@tu.org) with Trout Unlimited or Hezekiah Allen (Hezekiah@mattole.org) with Mattole Restoration Council.

(5) and (6): for Sonoma waterways, contact Don McEnhill (don@russianriverkeeper.org) with Russian Riverkeeper.

(7) and (8): for San Joaquin River and Delta, contact (among others) Bill Jennings (deltakeep@aol.com) with California Sportfishing Protection Alliance or Zeke Grader (zgrader@ifrfish.org) with PCFFA.

(9): for Salinas River, contact Steve Shimek (exec@montereycoastkeeper.org) with Monterey Coastkeeper.

(10): for Santa Clara River, contact Jason Weiner (jweiner.venturacoastkeeper@gmail.com) with Ventura Coastkeeper, Ron Bottorff (bottorffm@verizon.net) with Friends of the Santa Clara River or Cameron Yee (cyee@causenow.org) with CAUSE.

ⁱ U.S. EPA. August 2012. Water Quality Challenges in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary: EPA's Action Plan, p. 9, available at <http://www2.epa.gov/sites/production/files/documents/actionplan.pdf>.

ⁱⁱ Criteria 4-6 are taken from the State Water Board's AB 2121 Enforcement Priorities, Appendix G, available at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/instream_flows/docs/ab2121_0210/adopted050410instreamflowpolicy.pdf.

ⁱⁱⁱ National Research Council (NRC). 2004. Endangered and Threatened Fishes in the Klamath River Basin – Causes of Decline and Strategies for Recovery. The National Academies Press, Washington, DC.

^{iv} S.S. Papadopulos & Associates Inc. 2012. Groundwater Conditions in Scott Valley, California. Report prepared for the Karuk Tribe, Happy Camp, CA.

^v Lestelle, L. 2012. Effects of Dwinnell Dam on Shasta River salmon and considerations for prioritizing recovery actions. Report prepared for the Karuk Tribe, Happy Camp, CA.

^{vi} Higgins, Patrick, Consulting Fisheries Biologist. Feb. 2010. Evaluation of the Effectiveness of Potter Valley Project National Marine Fisheries Service Reasonable and Prudent Alternative (RPA): Implications for the Survival and Recovery of Eel River, Coho Salmon, Chinook Salmon, and Steelhead Trout.

^{vii} Klein, Randy D., Hydrologist. March 2007. Hydrologic Assessment of Low Flows in the Mattole River Basin 2004-2006, p. 1.

^{viii} Letter from Patrick Higgins, Consulting Fisheries Biologist to SWRCB. April 2, 2008. *Comments on Draft Policy for Maintaining Instream Flows in Northern California Coastal Streams*, pp. 13-15 (in Appendix A).

^{ix} For both of the Region 5 sets of waterways, there are agency processes ongoing to address flow issues. However, the lengthy time frame and uncertain future of these processes, and the sensitive and declining health of these waterways, demands that we use all available tools to (at a minimum) prevent waterway health from deteriorating further as these processes play out. Formal listing as “flow impaired” on the 303(d) list would provide invaluable assistance in this regard.

^x Based on the agency, NGO and academic testimony presented at the State Board's 2010 “Development of Flow Criteria for the Sacramento-San Joaquin Delta Ecosystem” hearing and State Board's Phase I SED hearing, as well as Fish and Wildlife’s 2010 “Quantifiable Biological Objectives and Flow Criteria for Aquatic and Terrestrial Species of Concern Dependent on the Delta,” we believe the Merced, Tuolumne, Stanislaus and San Joaquin Rivers would all qualify to be listed as flow impaired.

^{xi} *Id.*

^{xii} Letter from Jason Weiner, Ventura Coastkeeper to Jeffrey Shu, SWRCB. Aug. 30, 2010. Public Solicitation of Water Quality Data and Information for 2012 Integrated Report.