

It's Hard To Fish In A Dried Up Stream

*The Science And Policy
Of Water Quality
Standards For
Flow Protection*

Alabama Water Resources Conference
September 10, 2014



Alabama Rivers Alliance
Water Is Life

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ALABAMA WATER AGENDA
A GUIDE FOR ACHIEVING HEALTHY WATERS IN ALABAMA



Alabama Rivers Alliance

Alabama Rivers Alliance is a statewide network of groups working to protect and restore all of Alabama's water resources through building partnerships, empowering citizens, and advocating for sound water policy and its enforcement.



The Alabama Water Agenda

- A guide for Achieving Healthy Waters In Alabama
- Four Action Items
 - Enforcement
 - Agency Coordination
 - Funding
 - Policy

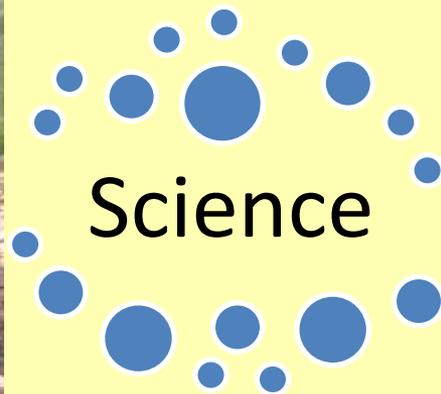
What is an Instream Flow Policy?

- Determination of how much water is flowing in a given stream*
- Protection of streams and their uses
- Restoration and sustainment of ecosystem processes
- Maintenance of Riverine Values through the preservation of the processes and functions of the river ecosystem based on hydrology, geomorphology, biology, connectivity, and water quality

* Instream Flows for Riverine Resource Stewardship, *Revised Edition*, Instream Flow Council, 2004

What is an Instream Flow Policy?

“It’s a determination of how much water is in a given stream, but also a determination of how much water is **NEEDED** in the stream to sustain its basic functions, and then a policy that is designed to insure that a sufficient amount of water stays in the stream and that the stream is not depleted below a certain point.” Gil Rogers, SELC



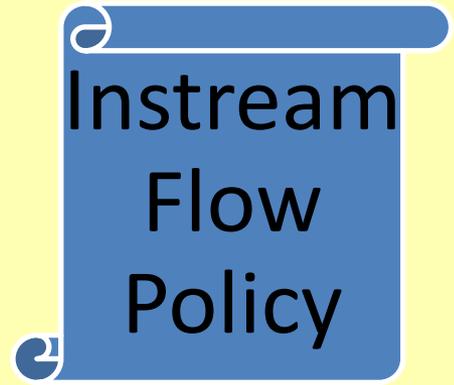
Science

- Natural Flow
- ELOHA
- Presumptive Standards



Law and Regulation

- State Law
- Water Management Plan
- State Water Quality Standards



Instream Flow Policy

- Combination of a presumptive standard and an ELOHA system of analysis
- Enforceable
- Adaptive

Science



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Hydrologic Alteration

“Human influence on watershed hydrology is extensive and may be a primary cause of ecological impairment in river and stream ecosystems”

“Increasing severity of diminished minimum and maximum flows was associated with a twofold increase in the likelihood that fish and macroinvertebrate communities were impaired.”.

Carlisle, Wolock and Meador, “Alteration of stream flow magnitudes and potential ecological consequences: a multiregional assessment,” *Front Ecol Environ* 2010; doi:10.1890/100053

What is Hydrologic Alteration?



“Cahaba River”
Cahaba River Society,
Drought, 2008

What is Hydrologic Alteration?

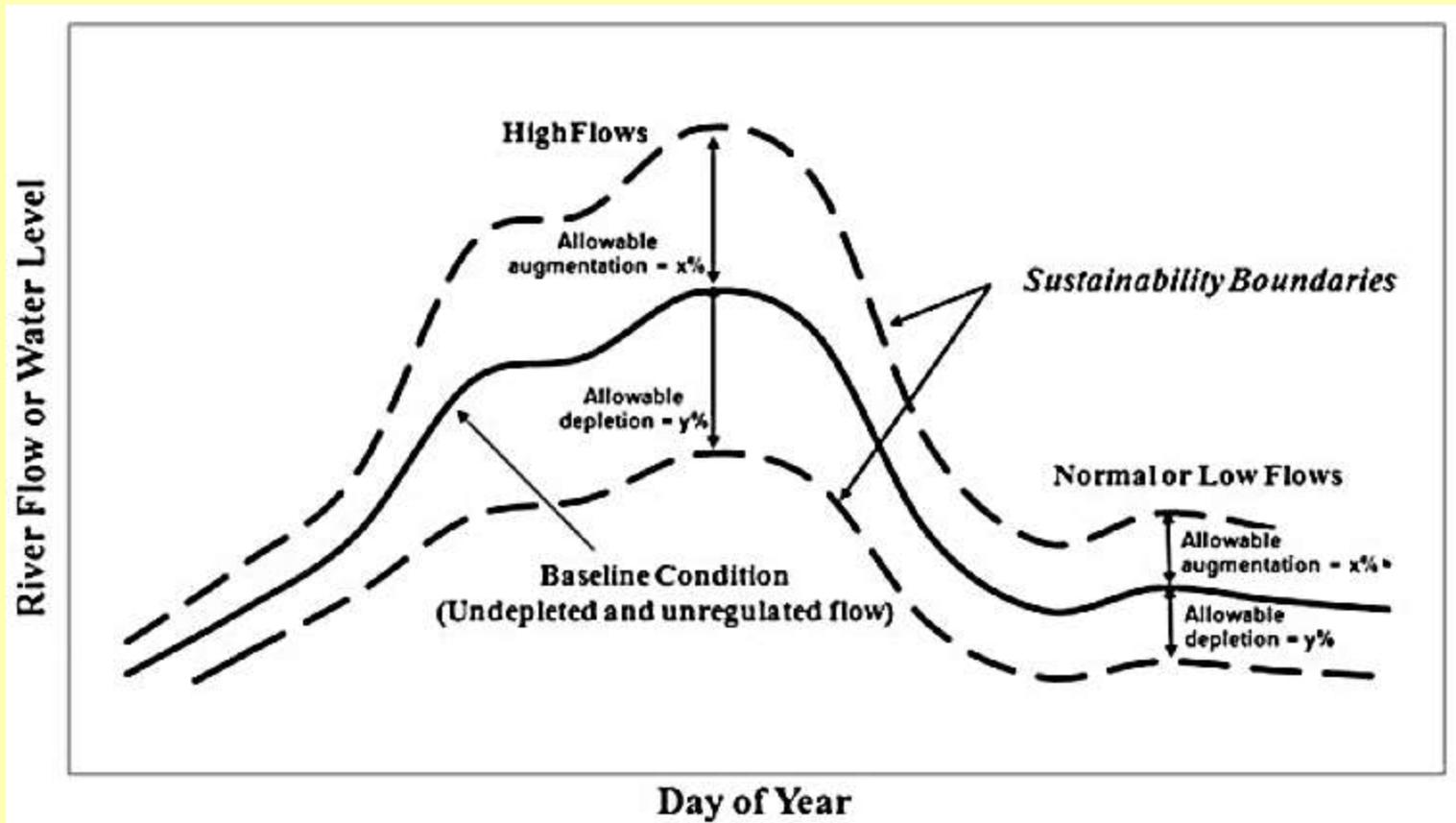


Illustration of the sustainability boundary approach from Richter (2009)

Why Should Alabama Address Hydrologic Alteration?

- A primary responsibility of ADEM is to “conserve the waters of the state”.
- U.S. Army Corps of Engineers update of the water control manual for the Alabama-Coosa-Tallapoosa (ACT) subbasin of the Mobile Bay watershed - Because consideration of hydrologic alteration is absent from Alabama’s water quality standards the state has difficulty establishing that the Corps decision will cause harm to Alabama.
- Recently proposed water reuse and aquifer storage and recovery (ASR) regulations invite criticism because of the potential adverse impacts to the rivers of the state.
- Science

Science

- ADEM has primary responsibility to ensure that the state's water quality standards adequately describe the components necessary to determine whether a stream is meeting designated uses including the "Fish and Wildlife" designation.
- ADEM's current standards do not do this.
- The current standards focus primarily on the chemical attributes of the water (i.e. Dissolved Oxygen, PH, Nutrients, Chemicals, etc.) with only temperature and turbidity describing physical attributes, and very cursory acknowledgement of the impacts to biological characteristics.
- ADEM's standards must evolve to reflect the current scientific understanding of riverine functions.

Science

Flow and water quality are inextricably interconnected

“Fundamental to [the charge to wisely manage the quantity and quality of waters] is ensuring that sufficient water is retained in rivers and lake systems at all times of year to sustain fishery and aquatic wildlife resources and ecological processes”.

“the amount of flow is one of several factors that affect maintenance of water quality, including, the physical, chemical, and biological attributes of water.”

Annear, T., I. Chisholm, H. Beecher, A. Locke, and 12 other authors. (2004). *Instream Flows for Riverine Resource Stewardship, revised edition*. Instream Flow Council, Cheyenne, WY. (IFC)

Science

Complexity

While “[t]he natural flow paradigm (preservation of the natural flow variability and ecological function of river systems) is axiomatic to ecological integrity of river systems,” the IFC recognizes that integrating the five riverine components into complex legal and institutional procedure is “a daunting challenge

Science

- [T]he key premises of the natural flow paradigm are that maintaining some semblance of natural flow regimes is essential to sustaining the health of river ecosystems and that health is placed at increasing risk with increasing alteration of natural flows (Richter et al., 2003; Richter, 2009).
- The structure and function of riverine systems are based on five riverine components:*
 - Hydrology (Magnitude, Frequency, Duration, Timing, Rate of change)
 - Geomorphology
 - Biology
 - Connectivity
 - Water Quality

* Instream Flows for Riverine Resource Stewardship, *Revised Edition*, Instream Flow Council, 2004

Law



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Law

- Under Section 502 of the Clean Water Act (CWA) pollution is defined as “the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water”. In *PUD No. 1 of Jefferson Cnty. V. Wash. Dept. of Ecology*, 511 U.S. 700 (1994) the Supreme Court of the United States agreed with the state of Washington that “§ 304 of the act expressly recognizes that water ‘pollution’ may result from ‘changes in the movement, flow, or circulation or any navigable waters...’”. In reaching this conclusion the court determined that the separation of water quality from water quantity is an “artificial distinction”.
- EPA defines “flow alteration” as “frequent changes in flow or chronic reductions in flow that impact aquatic life” U.S. EPA, *Guidelines for Preparation of the Comprehensive State Water Quality Assessments (305(b) Reports) and Electronic Updates*, EPA Doc. No. 841-B-97-002A, 4-14 (1997). Hydrologic alteration is the current term in the state of the science for flow alteration, which also now includes impacts to aquatic life as well as recreation, drinking water, etc.
- **Hydrologic Alteration: Water impaired by Pollution Not caused by a Pollutant!** Category 4c

Law

- Clean Water Act mandate to consider impairment due to hydrologic alteration.
- The Clean Water Act : State's water quality standards "[s]hall consist of the designated uses of the navigable waters involved and the water quality criteria for such waters based on such uses. Such standards shall be such as to protect the public health or welfare, enhance the quality of water and serve the purposes of this Act. Such standards shall be established taking into consideration their use and value for public water supplies, propagation of fish and wildlife, recreational purposes, and agricultural, industrial, and other purposes, and also taking into consideration their value for navigation." CWA § 303(c)(2)(A)
- 40 C.F.R. 131.6(c): State's water quality standard promulgated under § 303(c)(2)(A) must include "water quality criteria sufficient to protect designated uses."
- *PUD No. 1 of Jefferson Cnty. V. Wash. Dept. of Ecology*, 511 U.S. 700 (1994): "[i]n many cases, 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...as a fishery." *Id.* at 719.
- Thus, if Alabama does not address hydrologic alteration it is entirely possible for a water to meet all promulgated criteria, but not support its designated uses due to altered flow. That this possibility exist suggests that absent a flow criterion, a state's water quality criteria is not sufficient to protect designated uses as required by 40 C.F.R. 131(6)(c).

Law

- “[A] water body segment is considered impaired when the applicable WQS are not met or not expected to be met (i.e., threatened). “
- “[I]t is possible to have an impaired or threatened designated use that may not be determined through the assessment of available numeric and narrative criteria alone. For example, if a perennial stream is dry or has no flow and field staff are not able to collect a sample, then assessment of the designated use based solely on the sample results of an evaluation of narrative or numeric criteria may not be possible. However, data or information based on visual observations of no water in a perennial stream would be information on the physical condition of the stream, and would **demonstrate the aquatic life or recreational use is most likely not being attained and a State may conclude that the designated use is impaired.**”

US EPA, Office of Water,

Information Concerning 2016 Clean Water Act Sections 303(d), 305(b), and 314 Integrated Reporting and Listing Decisions, August 13, 2015

Law

- “EPA encourages States to evaluate all existing and readily available data and/or *information* when determining the attainment status of a water. Thus, data and/or *information* documenting significant hydrologic or habitat alteration could be used to make a use attainment decision for an impairment due to pollution not caused by a pollutant and should be collected, evaluated, and reported as appropriate.”
- “Types of information that could be used to identify threatened or impaired waters include visual assessments of habitat alteration or flow alteration by field personnel, including observations on the presence of **no flows, low flows, stand-alone pools, or extreme high flows.**”

US EPA, Office of Water,

Information Concerning 2016 Clean Water Act Sections 303(d), 305(b), and 314 Integrated Reporting and Listing Decisions, August 13, 2015

Law

- ADEM's duty under State law to protect instream flow is twofold.
 1. ADEM's responsibility to develop water quality criteria under the Clean Water Act is codified under State law in the Alabama Water Pollution Control Act, Ala. Code 22-22-1 et seq.
 2. ADEM and the Environmental Management Commission have a separate responsibility under the Alabama Water Pollution Control Act to "conserve the waters of the State" under Ala. Code 22-22-2

Recommendations



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Recommendations

Amend 335.6-10-.01(2) to state that :

Water quality criteria shall acknowledge and, when appropriate, preserve instream flows and levels in all water sources as necessary to protect the appropriate biological, chemical, and physical integrity of water sources.

Amend 335-6-10-.02 (8) to clarify that:

"Pollution" means the discharge of a pollutant or combination of pollutants *and* the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water .

Recommendations

In 335-6-10-.02 insert the following definitions:

(x1) "Instream flow" means the amount of flow needed, as determined by the Alabama Department of Conservation and Natural Resources, to uphold the natural biological, physical, and chemical integrity of a waterway established using generally accepted scientific methodologies considering hydrology, geomorphology, biology, connectivity, and water quality.

Recommendations

In selecting a generally accepted scientific methodology, ADCNR shall consult with and shall consider recommendations from the Water Resources Council, other experts, and the general public. In determining and establishing the instream flowrates, ADCNR shall give consideration to consumptive and nonconsumptive water uses, including, but not limited to, agricultural, industrial, municipal and domestic uses, assimilative waste capacity, recreation, navigation, fish and wildlife resources and other ecologic values, estuarine resources, aquifer recharge and aesthetics.

Recommendations

(x2) Biological integrity” of a water source means the maintenance of water in the source in the volume and at the times necessary to support and maintain wetlands and wildlife (including fish, flora, and fauna).

(x3) “Chemical integrity” of a water source means the maintenance of water in the source in the volume and at the times necessary to enable a water source to achieve the water quality standards prescribed for the water source by federal or State laws or regulations in light of authorized effluent discharges and other expected impacts on the water source.

Recommendations

(x4) “Physical integrity” of a water source means the volume of water necessary to:

- a. support commercial navigation of the water source as required by federal or state law or regulation;
- b. preserve natural functions of the riverine ecosystem
- c. preserve cultural, or historic resources as determined by or as required by federal or state law or regulation;
- d. provide adequate recreational opportunities to the people of the state; and
- e. prevent serious depletion or exhaustion of the water source.

Recommendations

In 335-6-10-.04 include the following:

(x) Developments constituting a new or increased hydrologic alteration shall assure that such alteration, alone or in combination with existing water uses, will not impair the natural biological, physical, and chemical integrity of a waterway.

Recommendations

In 335-6-10-.05 include the following:

(x) The quality of any waters impacted by a hydrologic alteration that requires consideration, review, certification, or approval by the Department shall be such as will maintain the natural biological, physical, and chemical integrity of the impacted waters and shall be such as will not cause the best usage of any other waters to be adversely affected by such hydrologic alteration. Waters not altered by more than ten percent from the instantaneous natural flow from all hydrologic alterations shall be presumed to not be impaired

Recommendations

Along with these changes to ADEM's 335-6-10, we reiterate our recommendation that the State adopt the proposals contained in the 2014 presentation *Merging Ideals for a Working Instream Flow Policy in Alabama* presented at the Alabama Water Resources Conference on September 4, 2014 including a provision in state law that provides:

“The State shall preserve instream flows and levels in all water sources as necessary to protect the appropriate *biological, chemical, and physical integrity of water sources* by reserving such waters from allocation and by authorizing additional protections of the waters of the State. “

Next Steps



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Next Steps

- Engage Stakeholders through Instream Flow Focus Panel
- Initiate Rulemaking as part of the 2015 Triennial Review of State Water Quality Standards
- Assess Watersheds for current alteration and impacts



"Only by working within the laws that govern the flow of water will happiness be achieved."

The Water Institute, attributed to Lao-tse

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