



Comprehensive Update of the Arkansas Water Plan

Fish and Wildlife Flows Methodology Meeting

January 22, 2013



Agenda

- Introductions and Purpose of Group
- Brief Background on the Arkansas Water Plan
- Discuss Recommendations from Scope of Work Development for Fish and Wildlife Flows
- Methods for Establishing Fish and Wildlife Flows and Recommended Next Steps

Introductions and Purpose of Group

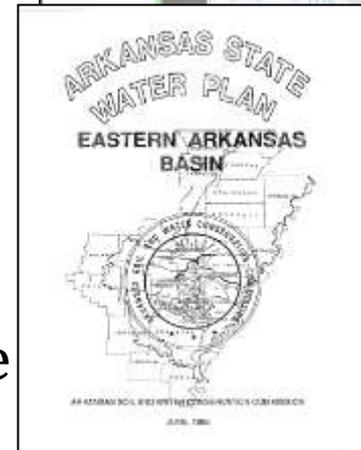
Draft Mission, Vision and Goals for AWP Update

- See Handout

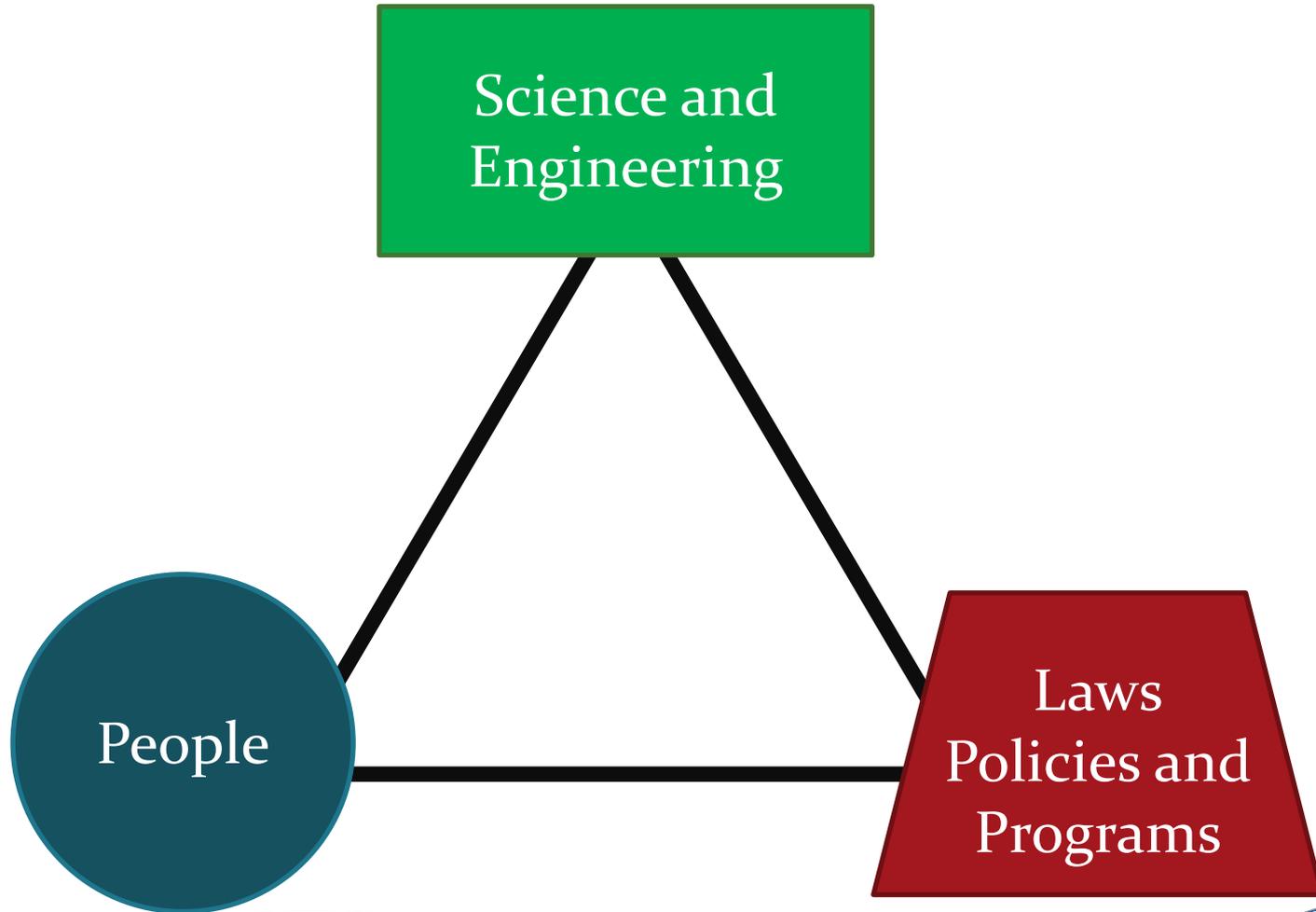
Brief Background on the Arkansas Water Plan

What is the Arkansas Water Plan?

- A comprehensive program for the orderly development and management of the State's water and related land resources
- The State policy for the development of water and related land resources in this State
- A planning framework to be used by all State agencies, commissions, and political subdivisions in all matters pertaining to the discharge of their respective duties and responsibilities as they may affect the comprehensive plan (1975 and 1990 are the most recent planning efforts)



What is the Arkansas Water Plan?



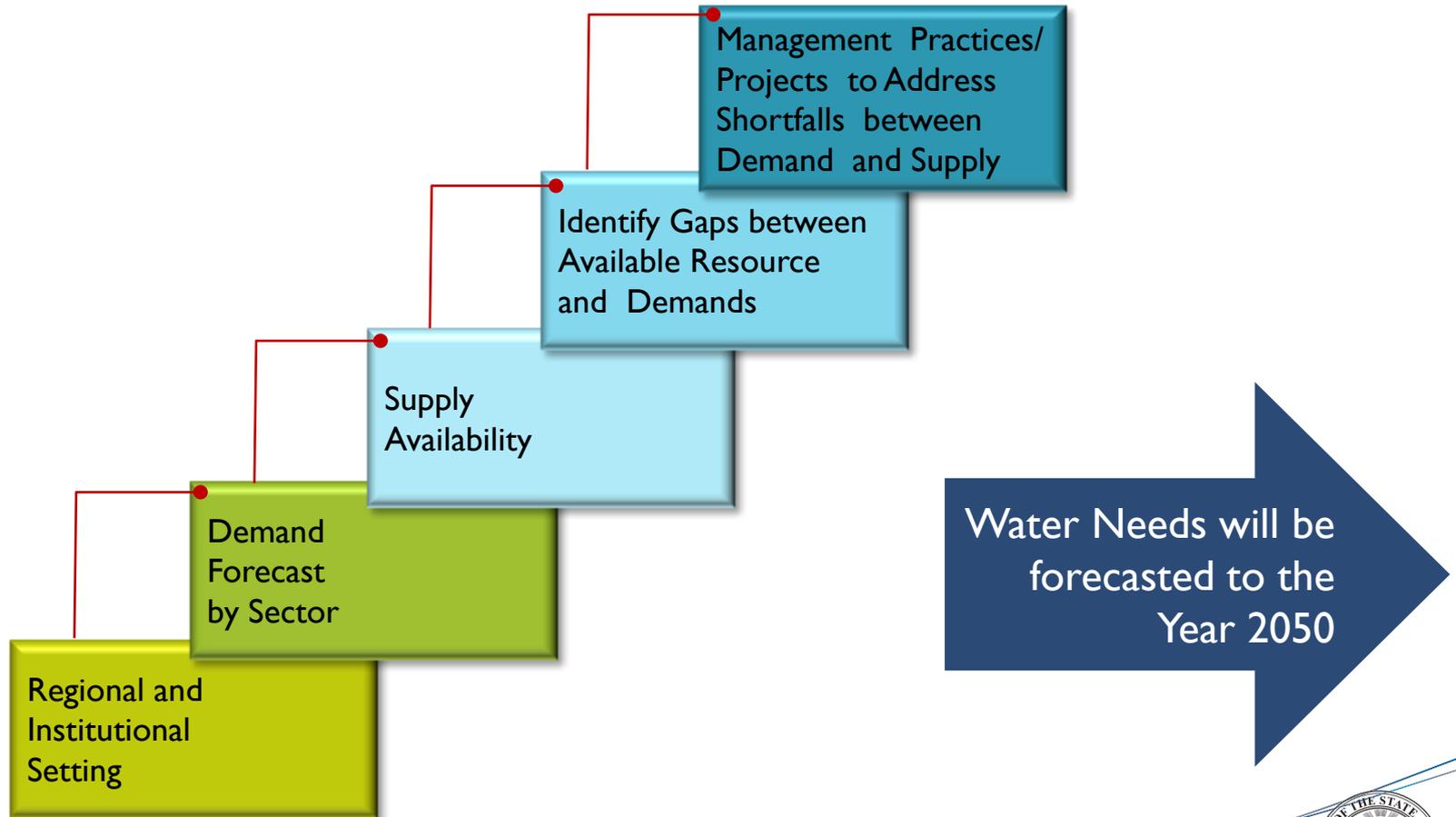
Why do we Need to Update the Arkansas Water Plan?

- We depend on water in sufficient quantity & quality for our very existence
- The wise use and protection of this resource is critical for current and future generations
- The existing AWP is over 20 years old
- How we use and value water has changed over this timeframe
- New data and information collection and analysis is needed to define water supply, water needs, and identify potential solutions to meet those needs
- Increasing demands on water resources requires new technical, policy, and financial tools to address identified water resource issues and needs

Why is the Arkansas Water Plan Important to our Future?

- While Arkansas has significant water resources -- they are not infinite
- Water is vital to the social and economic well being of our communities, and our overall quality of life
- A dependable water supply requires
 - Good water supply sources (quantity and quality)
 - The ability to provide this water to our homes and businesses
- The Arkansas Water Plan will provide us with the **science and information** to make **informed decisions** on the best way to **manage water to meet the needs of our citizens and the environment**

The Major Technical and Planning Elements of the Water Plan Update



Building on and Improving Existing Programs and Information

Comprehensive Update to the Arkansas Water Plan

Public and Stakeholder Input

Existing and New Data and Forecasted Needs

Existing Policies and Programs

Existing State Water Plan, State, Local, and Federal Statutes/Laws

Arkansas Water Planning - *Charting the Future*

2012

2013

2014

Water Education Program

Policy Review & Public Involvement

Scoping

Technical Phase

Resource Assessments

Forecasting

Planning Phase

*Regional Management
Strategy Formulation*

*Draft Plan &
Public Review*

*Final Plan
Rulemaking
Nov 2014*



Surface Water Availability Analysis and Fish and Wildlife Flows are Considered in Determining:

- Safe Yield
- Transfer of Surface Water/Excess Surface Water (Non-Riparian)
- Allocation of Surface Water During Times of Shortage

Safe Yield

- The safe yield of a stream or river is the amount of water available on a dependable basis that can be developed for a surface water supply
- Dependable streamflow is the flow that is present in a stream 95 percent of the time for the period of record
- Not all streamflow is available for development – must take into account minimum streamflows for fish and wildlife
- If minimum stream flow is greater than 95% percentile then safe yield is 0

Excess Surface Water

- 25% of the amount of water left over after calculating the amount of water required for specific needs
- Specific needs include
 - Riparian and non-riparian usage reported for the 1989 water year
 - Water needs of federal water projects existing on June 28, 1985
 - Firm yield of all reservoirs in existence on June 28, 1985
 - Maintenance of minimum streamflows for fish and wildlife, water quality, aquifer recharge requirements and navigation
 - Future water needs of the basin of origin as projected in the Arkansas Water Plan

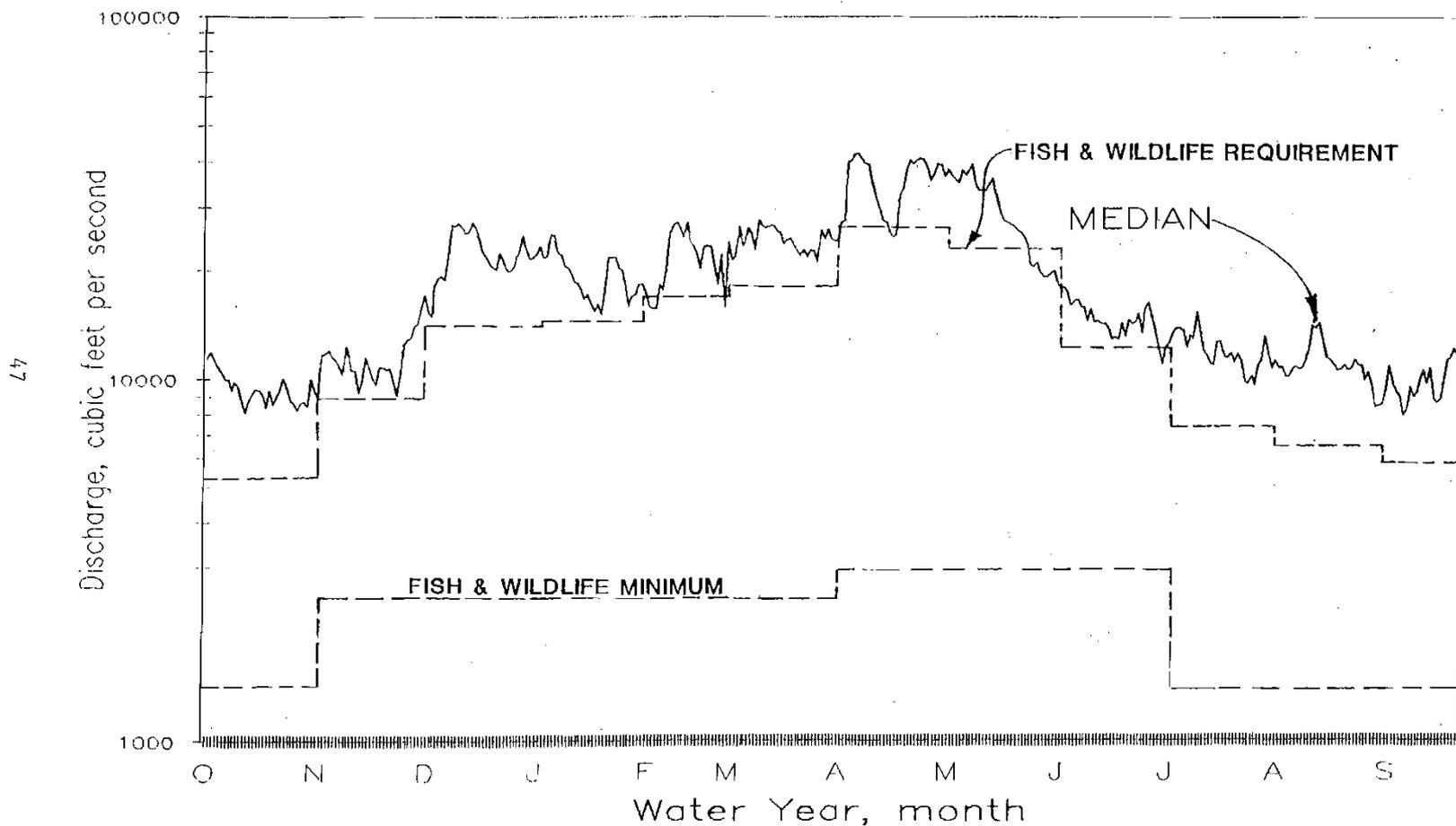
Allocation of Surface Water During Times of Shortage - Reserved Uses Prior to Allocation

- domestic and municipal-domestic
- minimum streamflow
 - interstate compacts
 - navigation
 - fish and wildlife
 - water quality
 - aquifer recharge
- federal water rights
- The Commission has never declared a period of shortage nor has a third party requested allocation

How is minimum streamflow defined?

- In 1990 Arkansas Water Plan:
 - Safe yield was calculated using minimum streamflows based on modified Tennant Method
 - Modified Tennant Method: 10 percent of the average seasonal flows
 - Excess surface water was calculated using Arkansas Method
 - Arkansas method: Nov-Mar 60% of MMF, Apr-Jun 70% of MMF; Jul-Oct 50% of MMF
- Allocation during times of shortage
 - minimum streamflows are developed on a site-specific basis since a given percentage of flow would not be appropriate for all streams
 - In 2009, the ANRC adopted minimum streamflow rules for the main stem of the White River

FIGURE 3-4d COMPARISON OF MEDIAN DAILY DISCHARGE FOR THE PERIOD 1965 TO 1984 TO SELECTED INSTREAM FLOWS REQUIRED FOR FISH AND WILDLIFE
WHITE RIVER AT NEWPORT, ARK.



SOURCE: U.S. Geological Survey

Discuss Recommendations from Scope of Work Development for Fish and Wildlife Flows

AWP Environmental Flow Approach

Identify Common Set of Environmental and Recreational Attributes (ANRC)

Stakeholders Provide Input on Attributes

Establish Priority Environmental and Recreation Areas

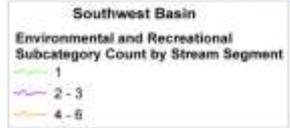
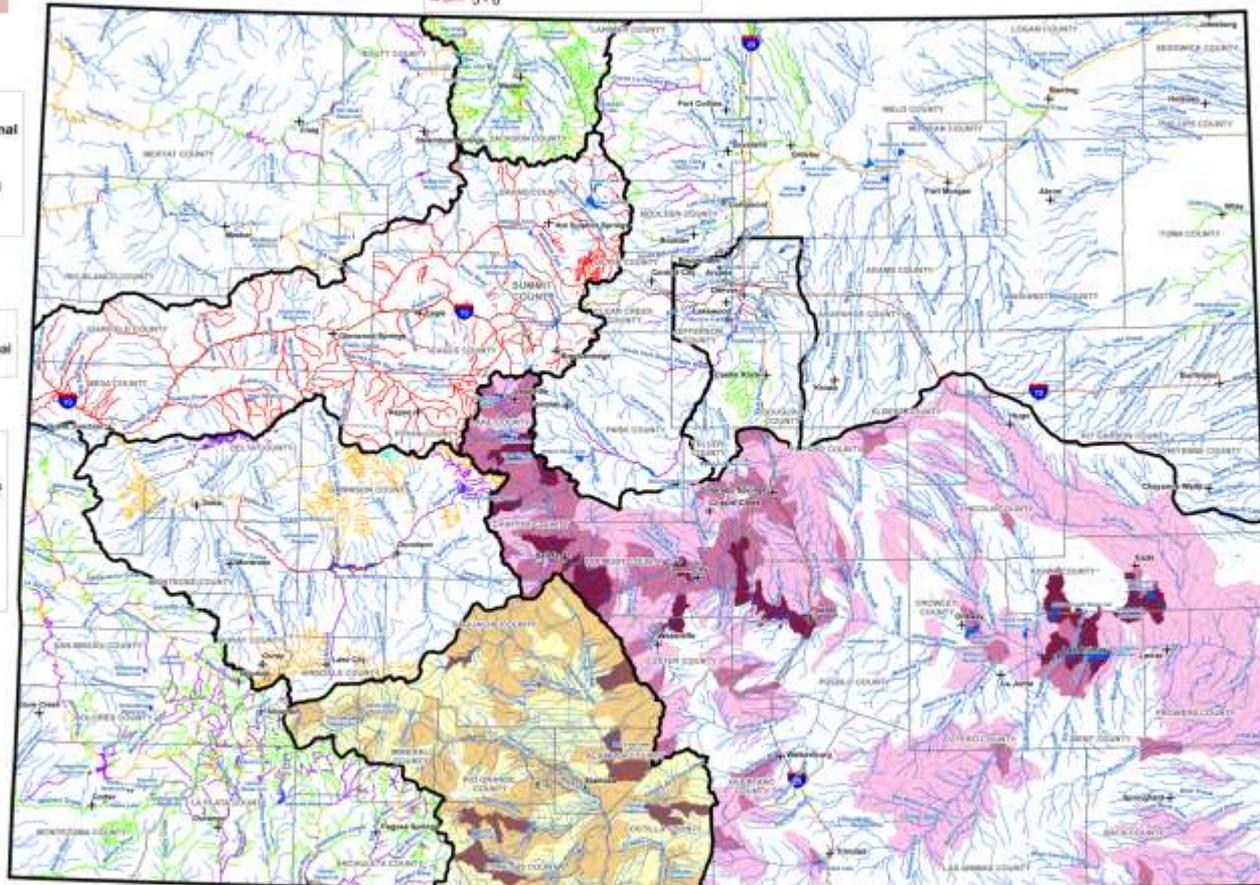
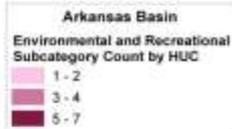
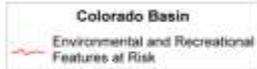
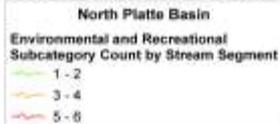
Pilot Environmental Flow Quantification Methods

Identify Implementation Next Steps

Statewide Nonconsumptive Needs Assessment Focus Map



Colorado Basins



** Note: See individual basin maps and documentation in Appendix D of the NCHA Mapping Report for detailed Needs Assessment information. **



Methods for Establishing Fish and Wildlife Flows and Recommended Next Steps

Methods to Discuss

- Prioritization
- Instream Flow Methods

Prioritization Methods

- Why prioritize? Site-specific methods for establishing instream flows needed for allocation during times of shortage are time consuming and expensive.
- Prioritization Methods
 - GIS Based
 - Best Professional Judgment based on knowledge gained during previous water plans and monitoring efforts
 - Combination

Instream Flow Methods

- Threshold flow
- Incremental Methods
- Monitoring/Diagnostic
- Ecological Limits of Hydrologic Alteration (ELOHA) – between threshold and incremental methods

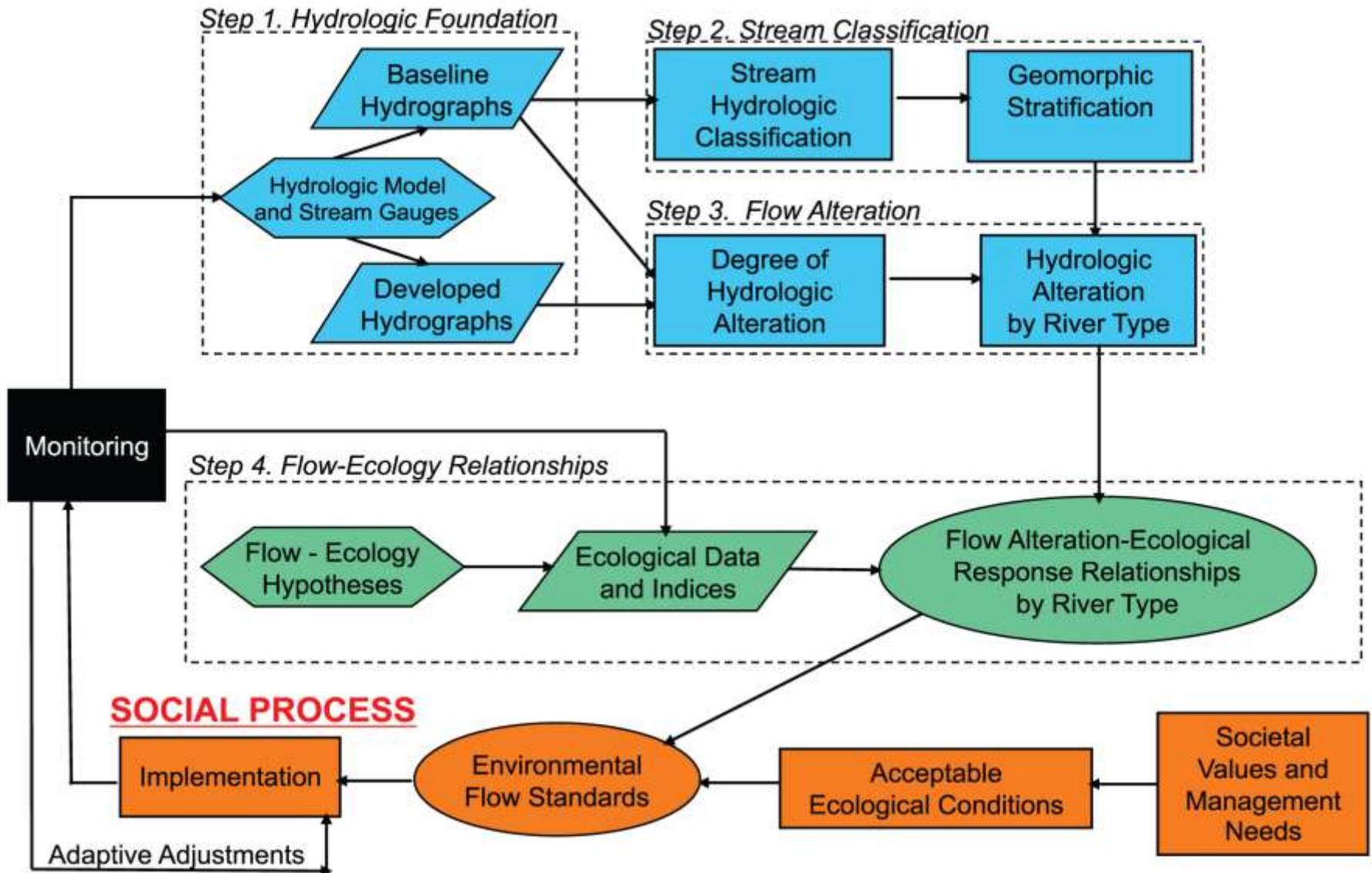
Instream Flow Methods Examples

Instream Flow Method	Examples
Threshold	Flow Duration Curve, Single Transect Hydraulic Based Habitat Method, Tennant Method, Arkansas Method, Wetted Perimeter
Incremental	PHABSIM, Two-Dimensional Hydraulic Model, IFIM
Monitoring/Diagnostic	IBI, Geomorphic Stream Classification, SSTEMP

ELOHA and Incremental Methods Address Concept of “Environmental Flows”

- Key components: magnitude, frequency, duration, timing, rate of change
- Poff et al. 2010: Streamflows required to maintain the function of particular organisms in a system or overall ecosystem structure and function
- Brisbane Declaration: “quantity, timing, and quality of water flows required to sustain estuarine ecosystems and the human likelihood and well being that depend on these ecosystems”

SCIENTIFIC PROCESS



Discussion Questions

- What are the group's thoughts on the social process, i.e. prioritization of important environmental and recreational resources across Arkansas? What methods do you think are most appropriate for Arkansas?
- Where is AGFC in its hydrologic baseline efforts related to ELOHA?
- Has there been any progress in developing flow-ecology relationships for the unique biological assemblages of fish in Arkansas?

Discussion Questions (con't)

- The state water plan update will update the safe yield and excess water calculations – what instream flow/minimum streamflow methods should be used during the next year in updating these calculations?
 - What are baseline flows – current vs. naturalized?
 - How should unregulated vs. regulated streamflows be handled?
 - For unregulated streams are existing streamflows considered baseline?
- Long-term what methods would improve upon existing instream flow methodologies?