

Sabine and Neches River Basin Environmental Flows Science Team

Outline of Activities — 2009

- 1. Gather and summarize available information**
- 2. Examine/evaluate available information that may reveal responses of individual organisms, populations, or species guilds/communities to variation in flow**
- 3. Identify key species of ecological, economic and/or social importance that are particularly flow-sensitive (or salinity response for estuarine flora/fauna)**
- 4. Gather and evaluate river discharge data for various time horizons**
- 5. Employ a flow building blocks ♦ type methodology (involving consideration of subsistence, base, high pulse & flood flows) to examine alternative scenarios including dry, average & wet years**
- 6. Examine commonalities and conflicts among biological components and physicochemical processes and attempt to find consensus flow regimes**

1. Gather and summarize available information on:

- a. hydrology (historical, naturalized, contemporary)**
- b. geomorphology & sediment dynamics**
- c. riparian plants—community structure, disturbance and recruitment dynamics**
- d. river fishes—hydraulic habitat, abundance trends, life histories**
- e. river molluscs—diversity, abundance trends, habitat**
- f. estuarine fishes & other key indicators, such as macrobenthos or marsh plants**

- 2. Examine/evaluate available information that may reveal responses of individual organisms, populations, or species communities to variation in flow over variable scales of:**
 - a. time— weekly, monthly, inter-annual, inter-decadal patterns**
 - b. space— river reaches to entire basin**

- 3. Identify key species of ecological, economic and/or social importance that are particularly flow-sensitive (or salinity response for estuarine flora/fauna)**
 - a. species that require certain flows during certain periods for reproduction**
 - b. species that require certain flows/periods for recruitment**
 - c. species that require certain flows/periods for longitudinal or lateral migration**
 - d. species that require certain flows/periods for habitat or feeding/food production**

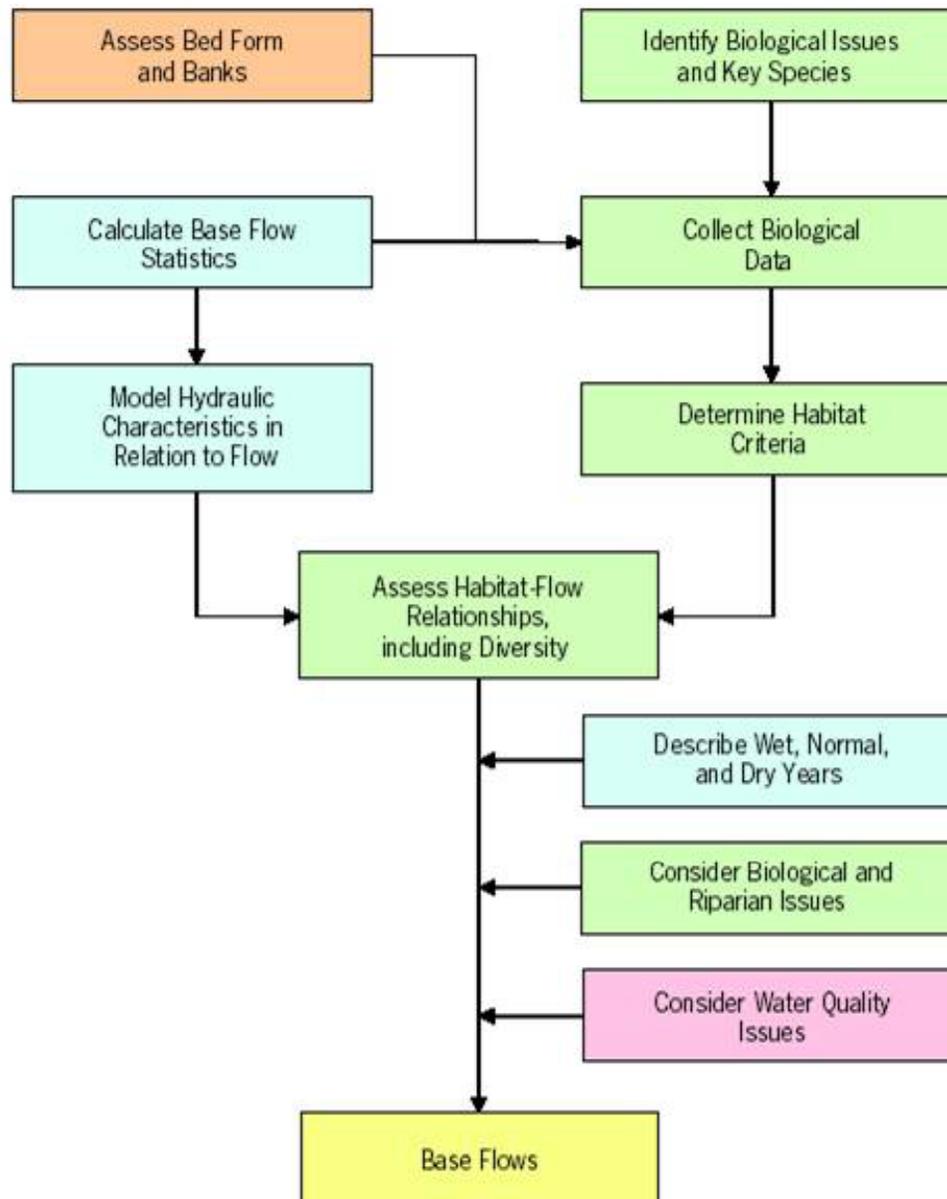
4. Gather and evaluate river discharge data for:

- a. a very recent time horizon**
- b. historical time horizons (pre-impoundment, post-impoundment)(naturalized◆)**
- c. apply evaluation tools, such as IHA (indices of hydrologic alteration), to view changes in flow variables**

- 5. Employ a flow building blocks ♦ type methodology (involving consideration of subsistence/minimum, target/normal, critical/high, and maintenance/flood flows) to examine alternative scenarios of managed flows for the benefit of:**
 - a. key biological components of the ecosystem**
 - b. key physical and chemical processes in the ecosystem (e.g. nutrients, sediments, water quality, productivity, connectivity of aquatic habitats)**

- 6. Examine commonalities and conflicts among biological components and physicochemical processes,
then attempt to find one or more “optimal” ♦ (consensus) flow regimes that benefits the greatest number of key components and processes**

From Joe Trungale's presentation at 2008 Workshop for Environmental Flows in Cypress Creek/Caddo Lake



Instream Flow Building Blocks

Big Cypress Creek/ Caddo Lake

Floods

6,000-10,000 cfs for 2-3 days
 Every 3-5 years
 *Maintain aquatic habitat in floodplain
 * Riparian seed dispersal
 * Inhibition of upland vegetation for both creek & lake
 *Seed dispersal
 * Vegetation removal
20,000 cfs for 2-3 days
 Every 10 years
 *For channel migration

High Flow Pulses

6,000 cfs for 2-3 days
 Every 2 years
 * For channel maintenance

1,500 cfs for 2-3 days
 3-5X a year every year
 * 1 occurring in March for Paddlefish
 * Sediment transport, oxbow connectivity
 •Waterfowl habitat flushing
 (Includes December)

Low Flows

40 – 536 cfs
 Maintain biodiversity and connectivity (backwater & oxbows)

268-347 cfs
 Pre-dam median

390 - 79 cfs
 Benthic drift & dispersal, fish spawning

35 - 40 cfs
 Fish habitat

40 - 117 cfs
 Pre-dam median

90 cfs
 Fish habitat

218 – 49 cfs
 Spawning habitat

13 - 6 cfs
 Maintain aquatic diversity

40 - 90 cfs
 Fish habitat

JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC

Key

- Wet Year
- Avg Year
- Dry Year