Sabine and Neches River Basin Environmental Flows Science Team

Outline of Activities — 2009

1. Gather and summarize available information on:

    a. hydrology (historical, naturalized, contemporary)
    b. geomorphology and sediment dynamics
    c. riparian plants—community structure, disturbance and recruitment dynamics
    d. river fishes—hydraulic habitat, abundance trends, life histories
    e. river mollusks—diversity, abundance trends, habitat
    f. estuarine fishes and 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. 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 and attempt to find one or more “optimal” (consensus) flow regimes that benefits the greatest number of key components and processes

7. Examine and discuss how alternative flow scenarios could influence current and projected human uses of water (e.g. municipal water supplies, industry, agriculture) or aquatic/riparian habitats (e.g. recreation, fisheries). Examine and discuss potential tradeoffs and alternatives among components in an attempt to maximize important natural assets and socioeconomic interests within the basin and estuary. Produce 1-3 acceptable annual flow scenarios, including consideration of “wet”,”dry”, and normal years.