Developing Environmental Flow Requirements: Savannah River Case Study

River Research and Applications

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The Nature Conservancy

SAVING THE LAST GREAT PLACES ON EARTH

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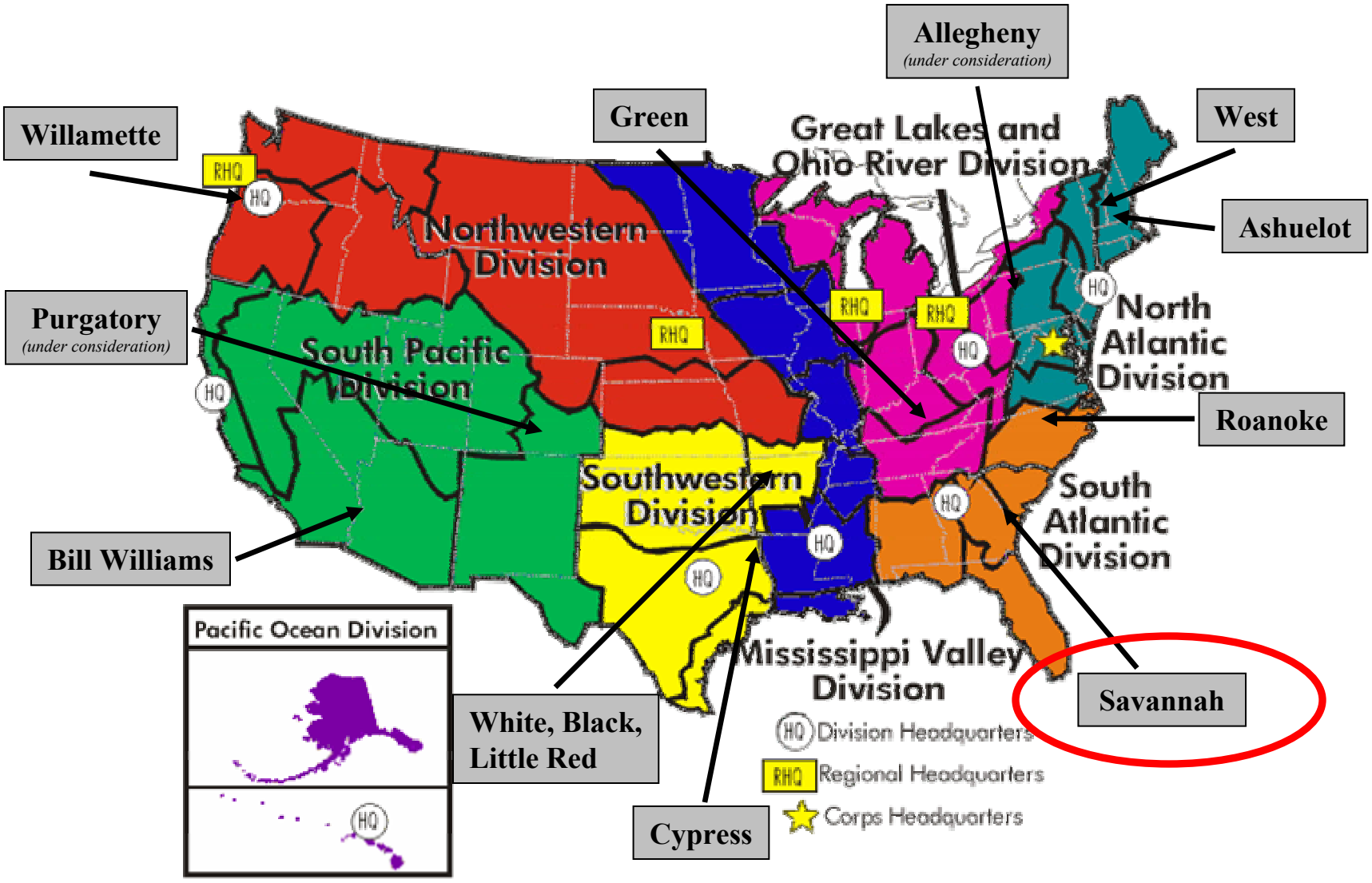
Sustainable Rivers Project

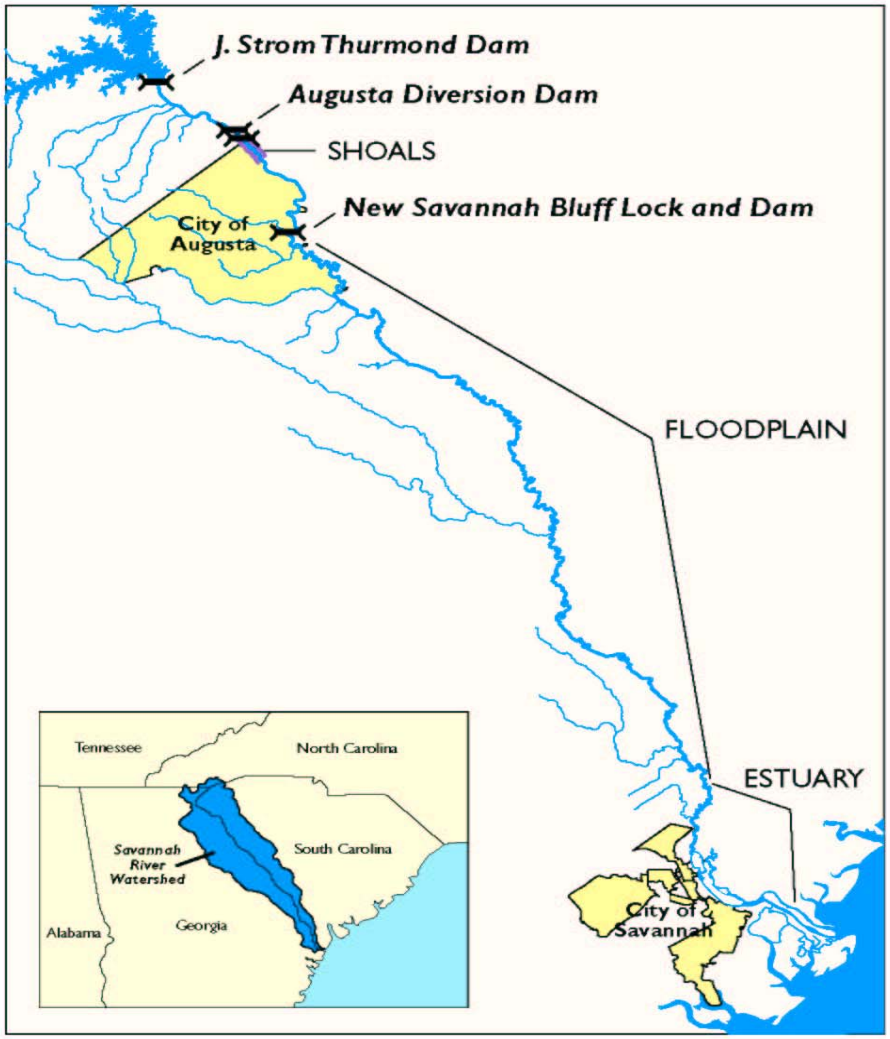
Current Sites

US Army Corps of Engineers®

The Nature Conservancy
SAVING THE LAST GREAT PLACES ON EARTH

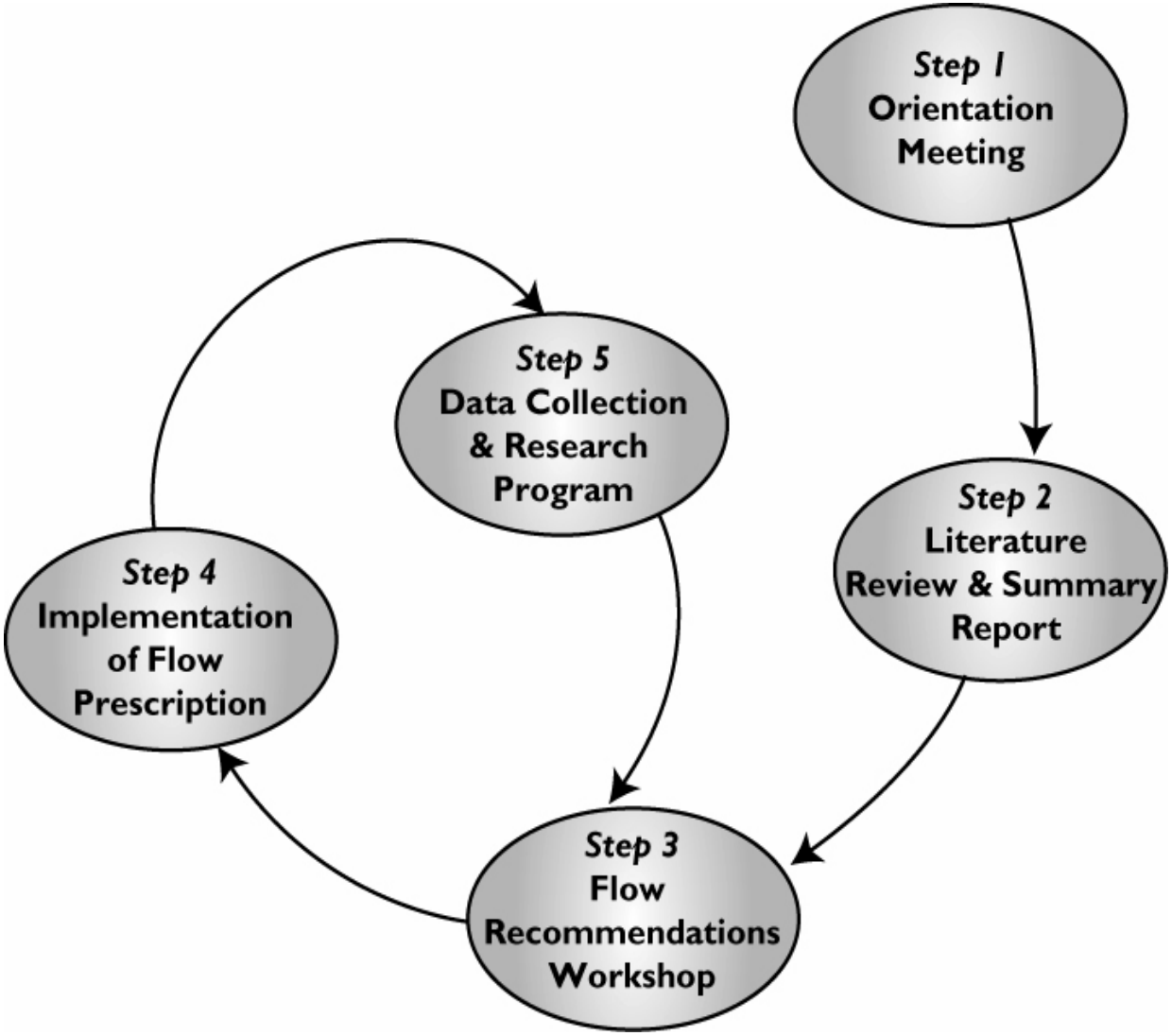


Lower Savannah River and Estuary



Developing & Implementing Environmental Flow Recommendations

Savannah River (GA/SC)



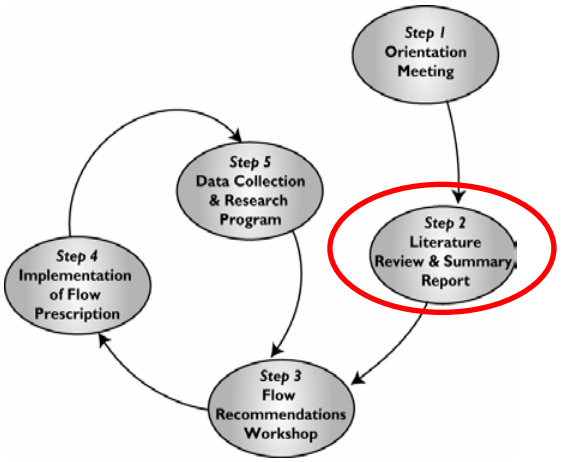
Orientation Meeting

May 2002

- *Purpose:* Launch a collaboration to collect and apply our best knowledge on flow-ecological process relationships to water management

- *Invitees*: Agencies, NGO's, University Researchers, consultants (50-60 participants)

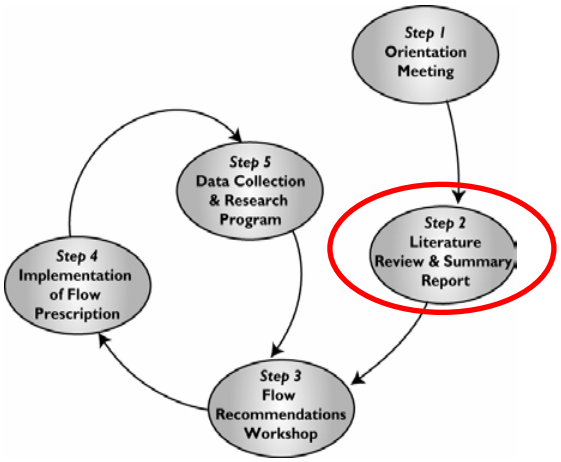
- *Outcome:* Designed a process and identified key contributors for defining a set of essential flow characteristics needed to sustain the integrity of the Savannah River ecosystem



Preparation of Literature Review

(Oct - Nov, 2002)

- Conduct a literature review of sources that appear useful in informing environmental flow recommendations (Savannah and similar systems)
- Focus on the whole ecosystem, including the shoals, river-floodplain, and estuary
- Review for completeness by a diverse group of leading scientists



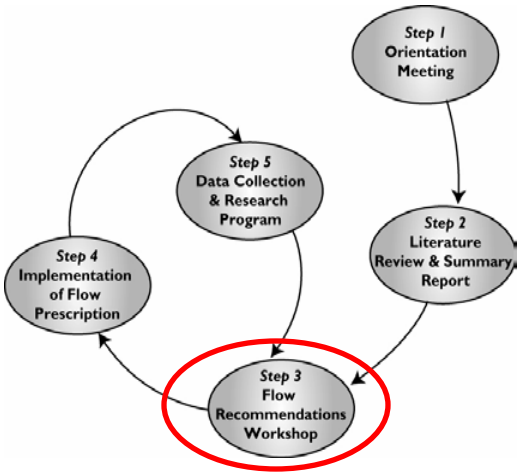
Preparation of Summary Report

(Nov 2002 - Feb 2003)

- key findings about linkage between specific ecological flow components and biotic tolerances or dependencies
- pictorial models illustrating connection between natural hydrographs and life cycles of representative species
- box-and-arrow diagrams expressing relationships between ecological flow components and biotic responses or dynamics.
- Reviewed by leading scientists, diverse areas of expertise

Environmental Flow Workshop

(April 2003)



Environmental Flow Workshop

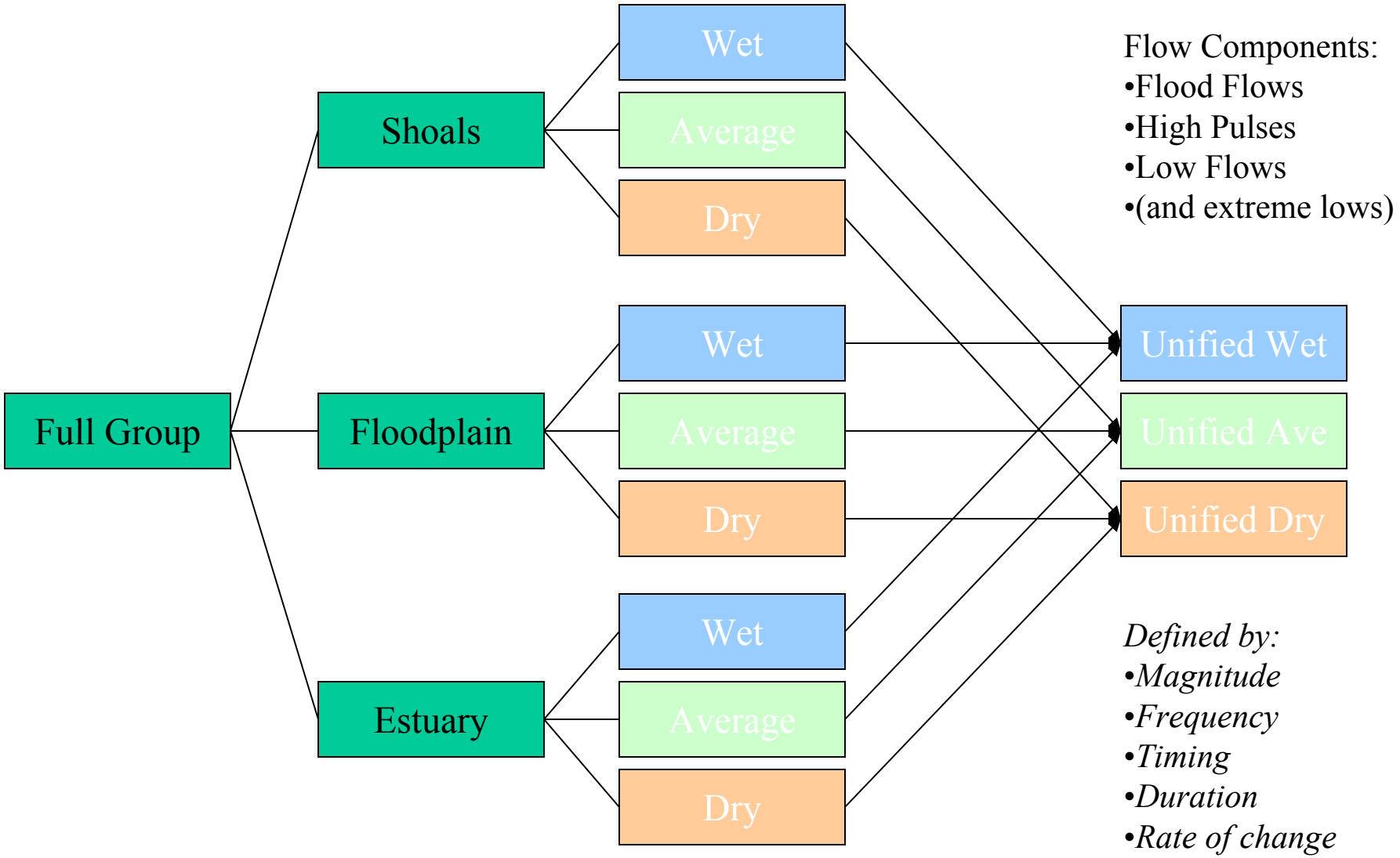
(April 2003)

- Workhop: 2½ days, ~45 scientists (agencies, academics and NGO's)
- Three break-out groups defined ecological flow recommendations for:
  (i) Augusta shoals;
  (ii) river-floodplain section from Augusta shoals to estuary; and,
  (iii) estuary
  ↙*Low Flows*, *High Flow Pulses*, *Floods*
- Full group integrated flow recommendations across the 3 river reaches
- Report generated; reviewed by all workshop participants

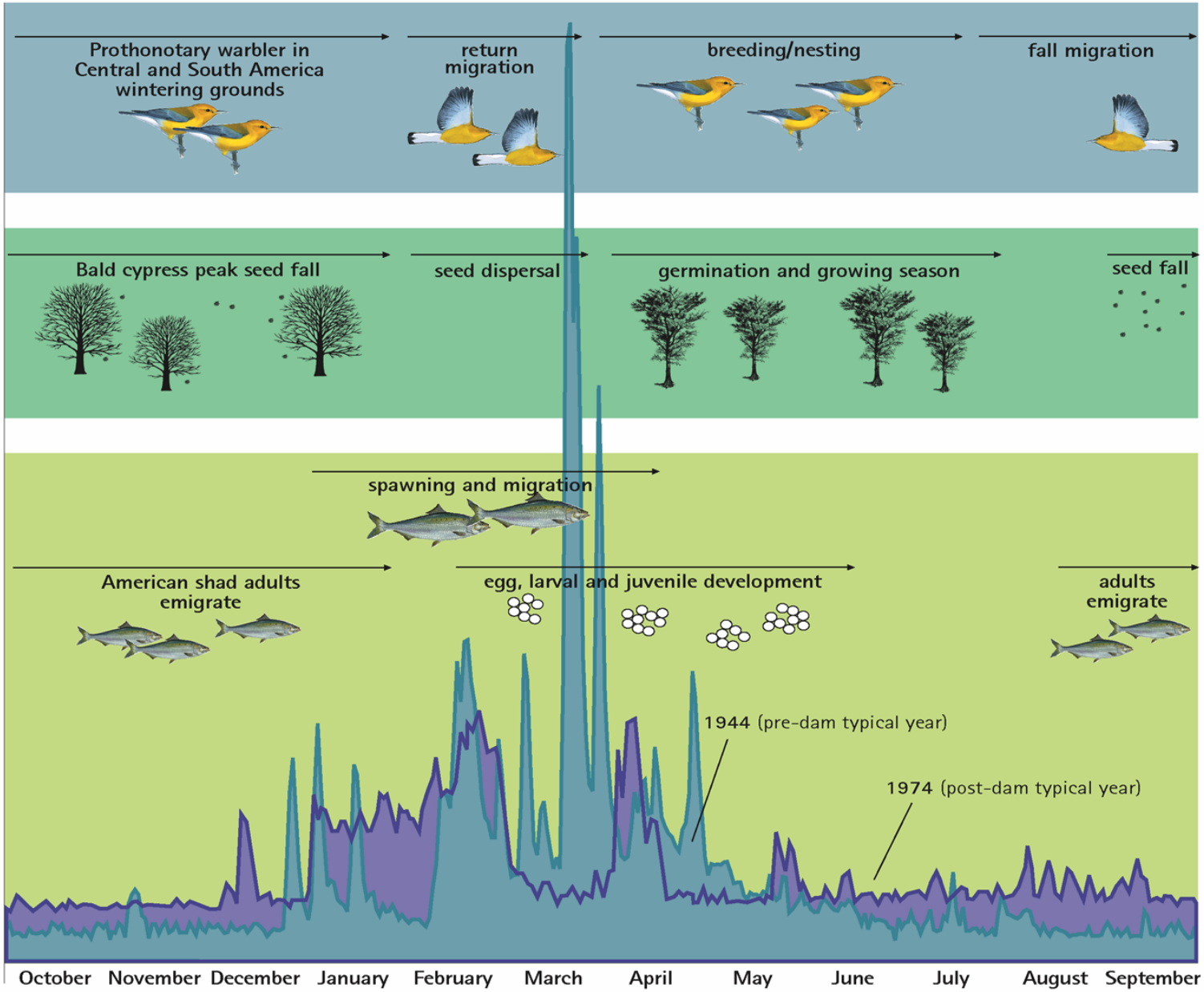
The goal was *not* to create optimal conditions for all species all of the time;

↙ we wanted to create adequate conditions for all native species *enough* of the time.

Developing Ecosystem Flows

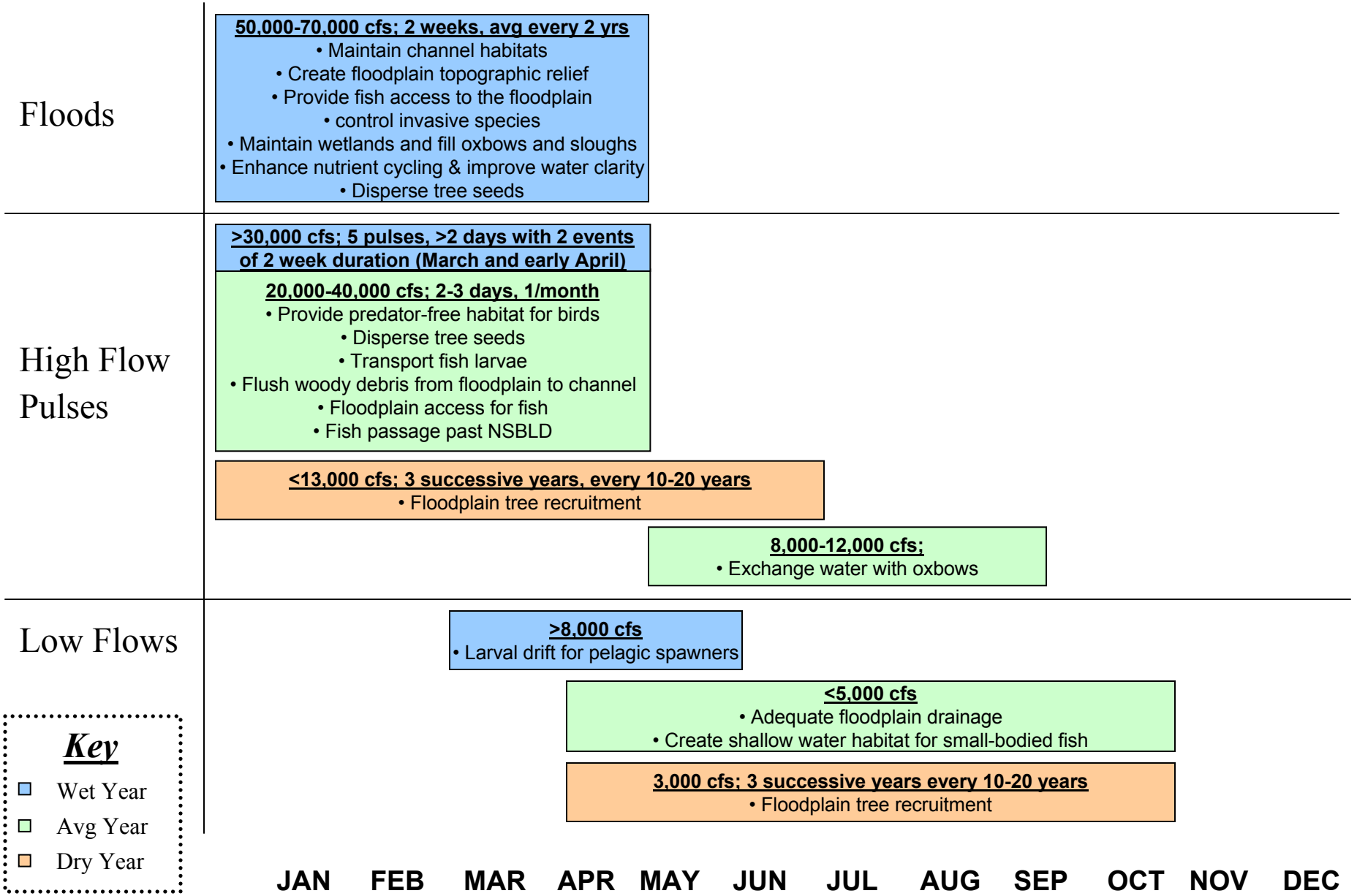


Ecological Model of the Savannah River

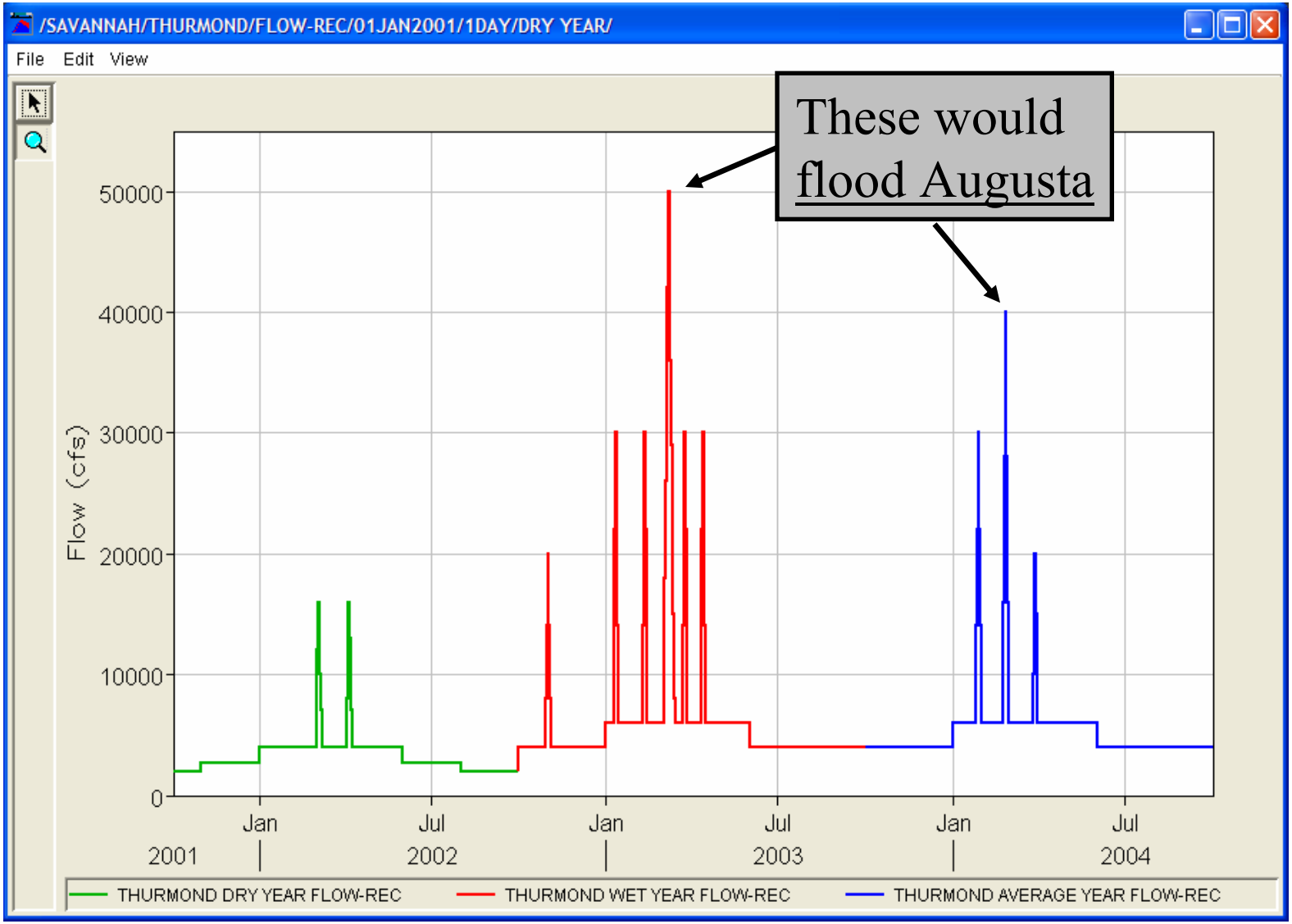


Environmental Flow Recommendations

Savannah River, below Thurmond Dam (*River-Floodplain*)



Savannah Flow Recommendations



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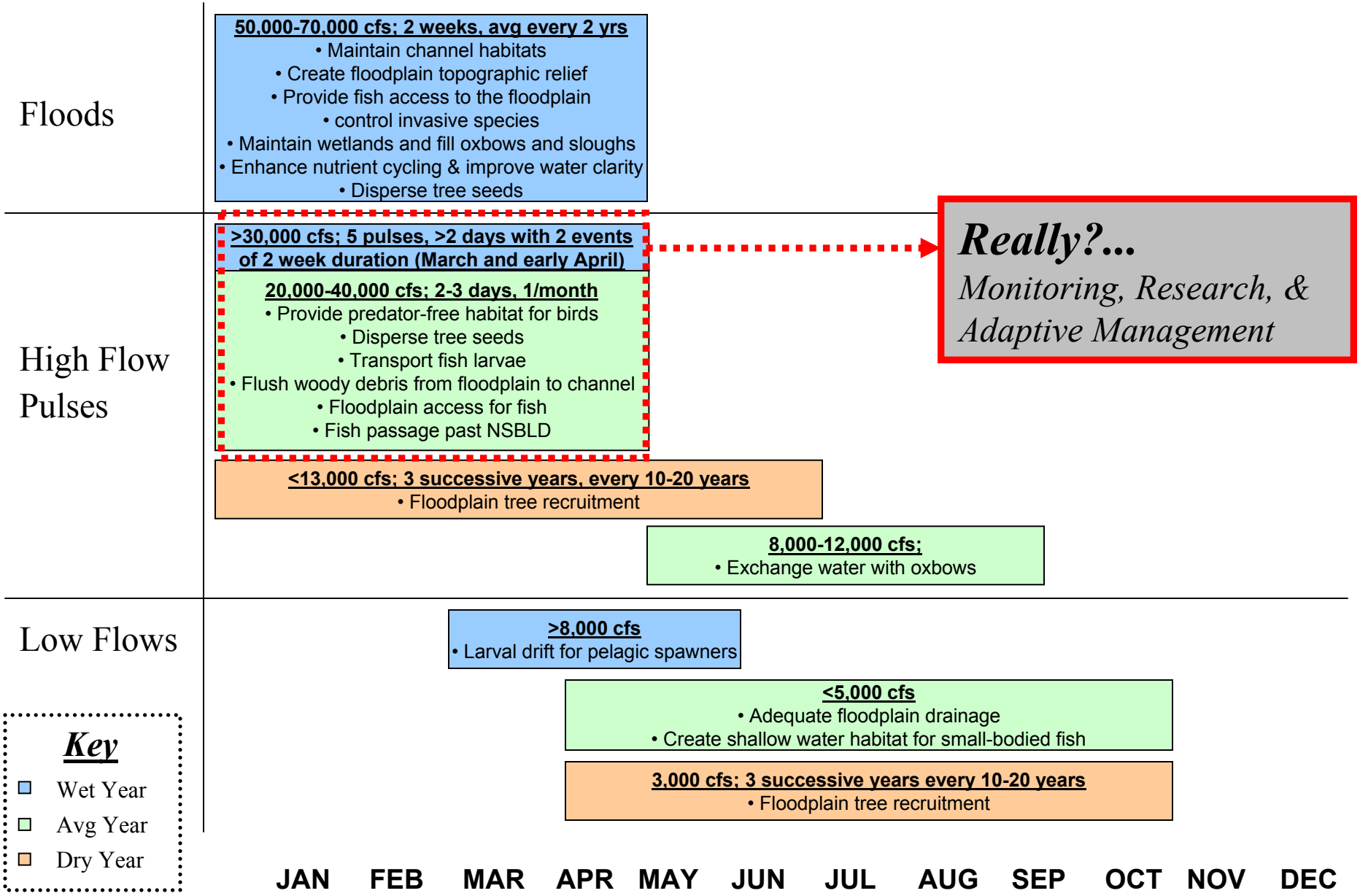
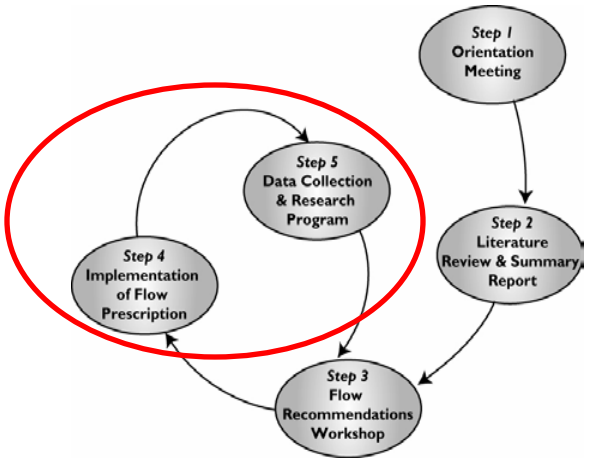


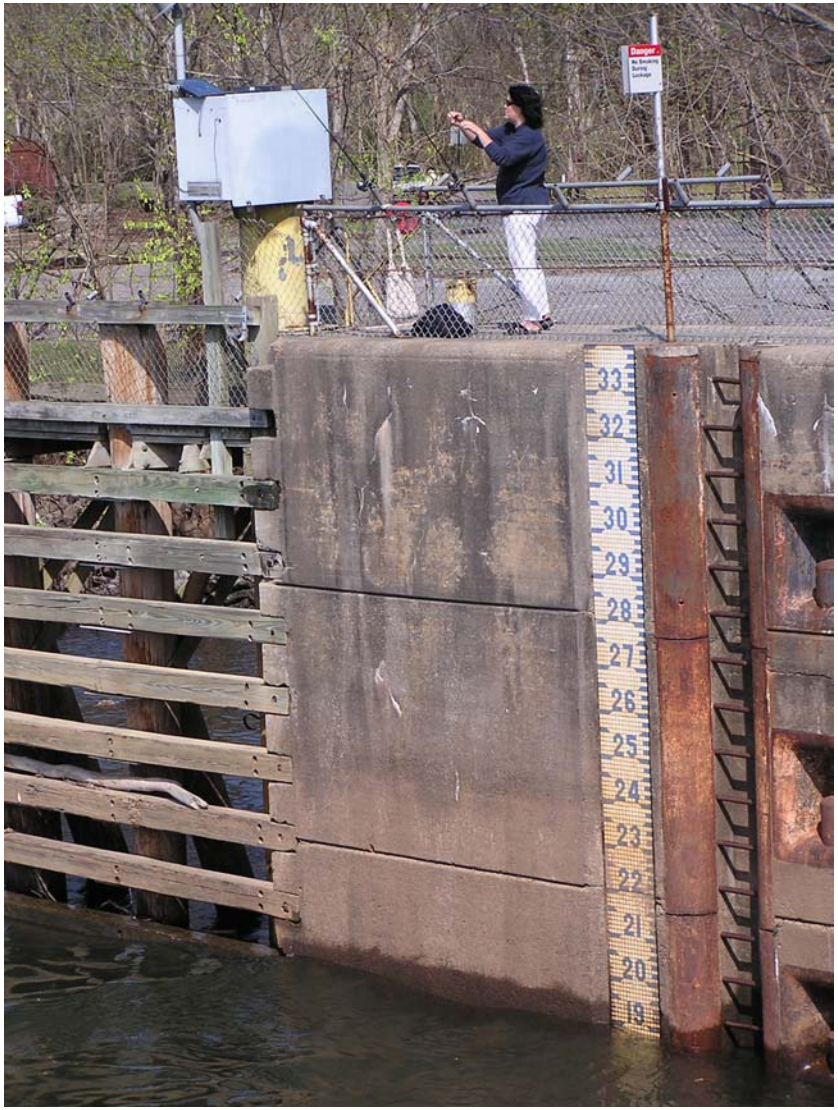


Assess & Implement Flows, Monitoring and Adaptive Management

- Assessing flow recommendations (modeling)
- Implementing Flows (initial):
  (i) March 2004
  (ii) October 2004
  ↙ *with some monitoring*
- Developing a strategic monitoring plan

High Pulse Release

(March 2004)



Steps for Developing Ecosystem Flow Recommendations

Savannah River (GA/SC)

Step 5
Data Collection
& Research
Program

Ongoing

Step 4
Implementation
of Flow
Prescription

March and Oct 2004 (initial)

Step 3
Flow
Recommendations
Workshop

April 2003

Savannah River

Case Study Summary

- Collaborated to define ecosystem flows:
  - *done for the whole system (shoals, river-floodplain, estuary)*
  - *applied best **available** science*
  - *completed in one year, for $90K*
- Identified & prioritized knowledge gaps and research needs
- Developing a strategic monitoring plan to assess dam re-operation and inform future management
- Modeling to assess multiple future scenarios