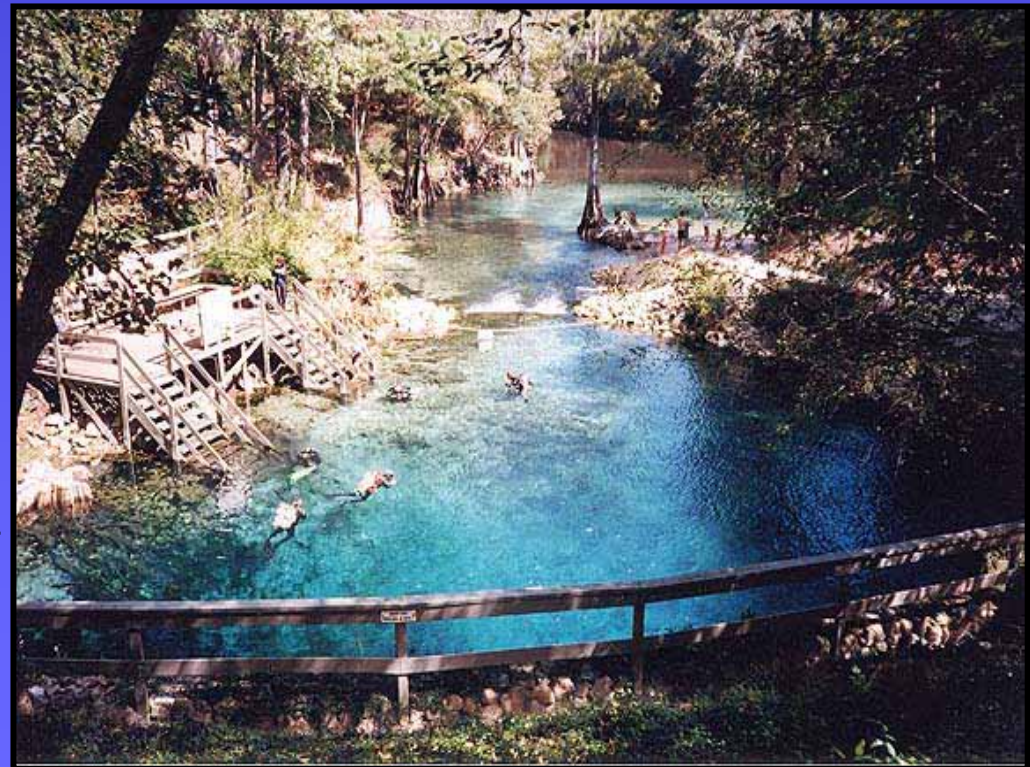


DEVELOPMENT OF MINIMUM LEVELS AND FLOWS FOR BLUE SPRING, MADISON COUNTY, FLORIDA

Suwannee River Basin and Estuary Workshop

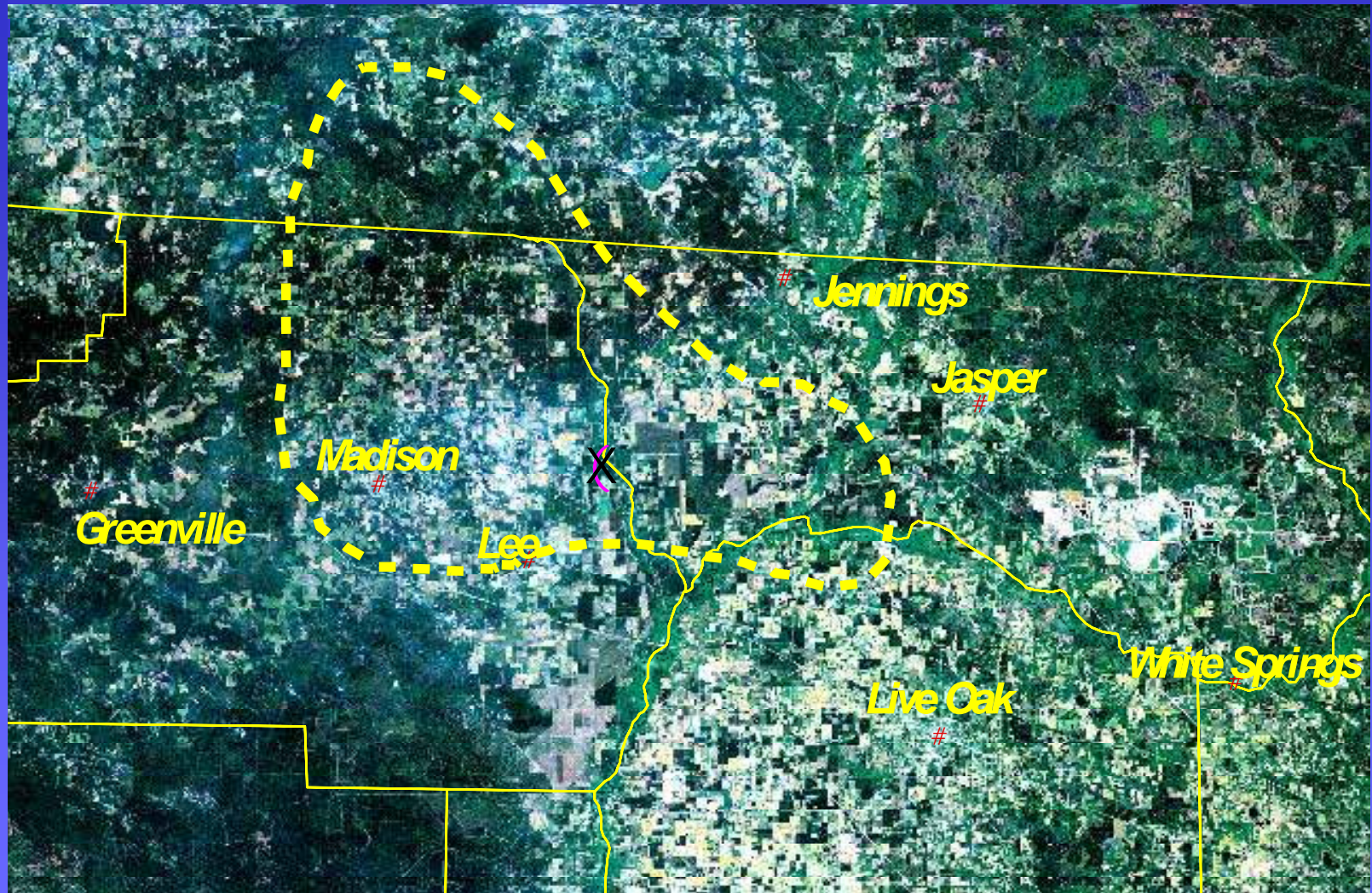
Sam Upchurch - SDII Global Corp.
Mark Farrell - Water Resources Assoc.
Tony Janicki - Janicki Environmental
John Good, Rob Mattson, David Hornsby -
SRWMD
Jim Schneider – SDII Global Corp.
David Wade, Kate Malloy – Janicki Env.



Project Objectives

- Define “significant harm” for spring
- Establish Minimum Flow for spring
- Assist District with specific permitting tools
 - Groundwater Assessment Tool
 - Water Shortage Plan

Madison Blue Study Area



Data Issues

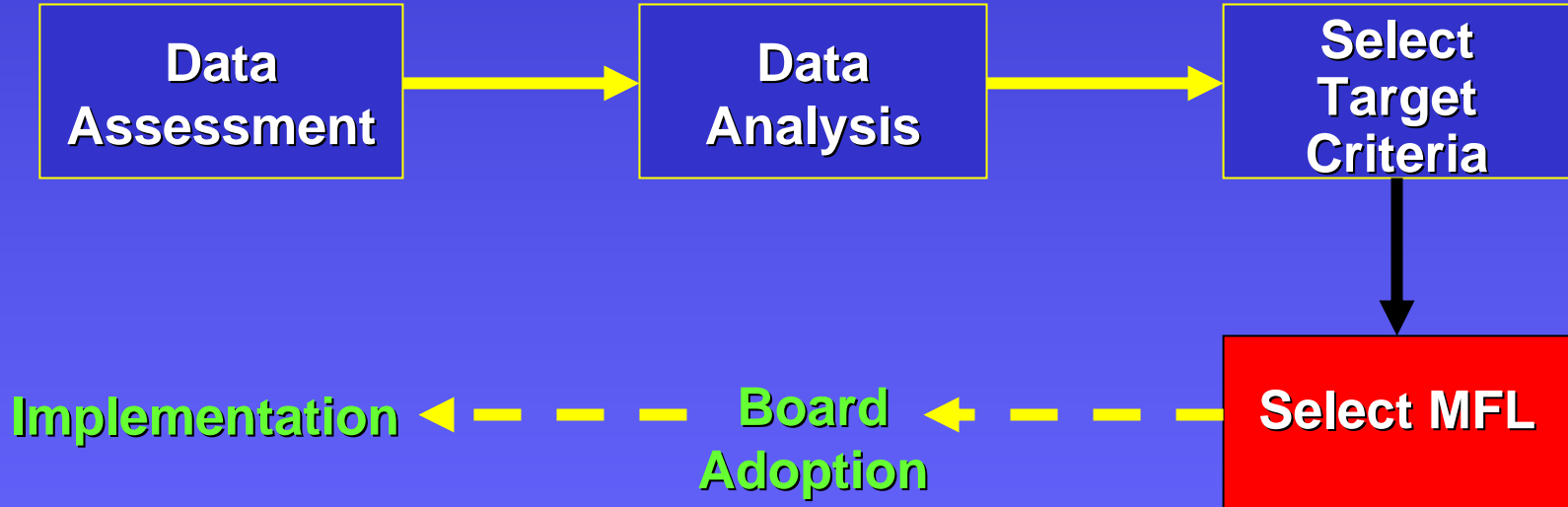
- New withdrawal
- Limited biologic and hydrologic data
- Impact of spring on Withlacoochee River
- Spring is an estevelle
- Improved water-use modeling tools needed

Views of the Spring



Mixing of spring and river water

MFL Establishment Process



MFL Issues

- Limited data
- Limited ecological activity in spring run
- Interaction with Withlacoochee River
- First magnitude spring classification

Approach

- Use best available data
- Evaluate applicable 62-40.473 criteria
- Identify limiting target criteria
- Identify minimum flow to prevent significant harm to water resource and related ecology

62-40.473 F.A.C.

Ecological and Water Resource Values

- a. Recreation in and on the water;
- b. Fish and wildlife habitats and the passage of fish;
- c. Estuarine resources;
- d. Transfer of detrital material;
- e. Maintenance of freshwater storage and supply;
- f. Aesthetic and scenic attributes;
- g. Filtration and adsorption of nutrients and other pollutants;
- h. Sediment loads;
- i. Water quality; and
- j. Navigation.

Methods

- Integrate surface- and ground-water data
- Synthesize historic spring discharge
- Process
 - Statistical models
 - Flow duration models
 - HEC-RAS models
- Identify ecologic impacts
- Correlate flow and ecological constraints

Water Quality

- **No significant relationship between MBS water quality and Withlacoochee River**
- **Will be an issue in the Withlacoochee River MFL**

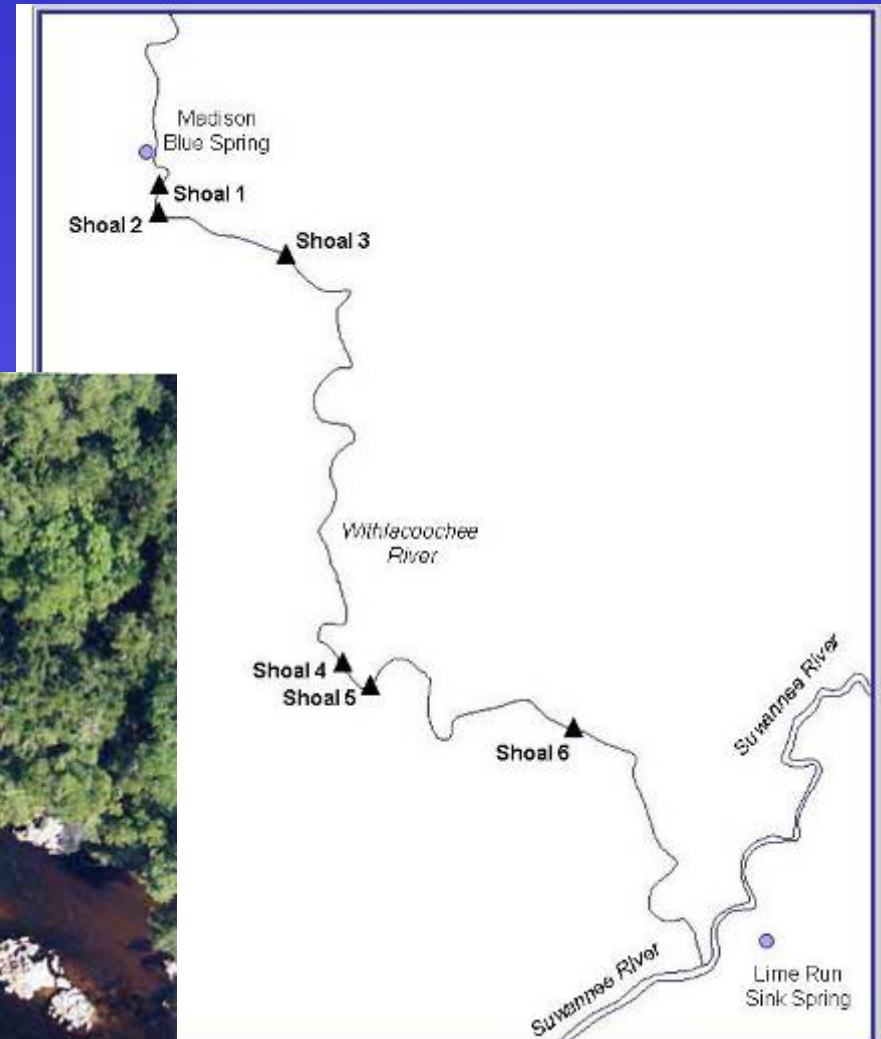
Relationship of Spring to River

- At low flow MBS appears to contribute about 25% of base flow
- To avoid low MBS discharge issues during flood, set MFL for river stages < 52 feet NGVD
- Maintenance of stage over downstream shoals by MBS base flow is limiting factor

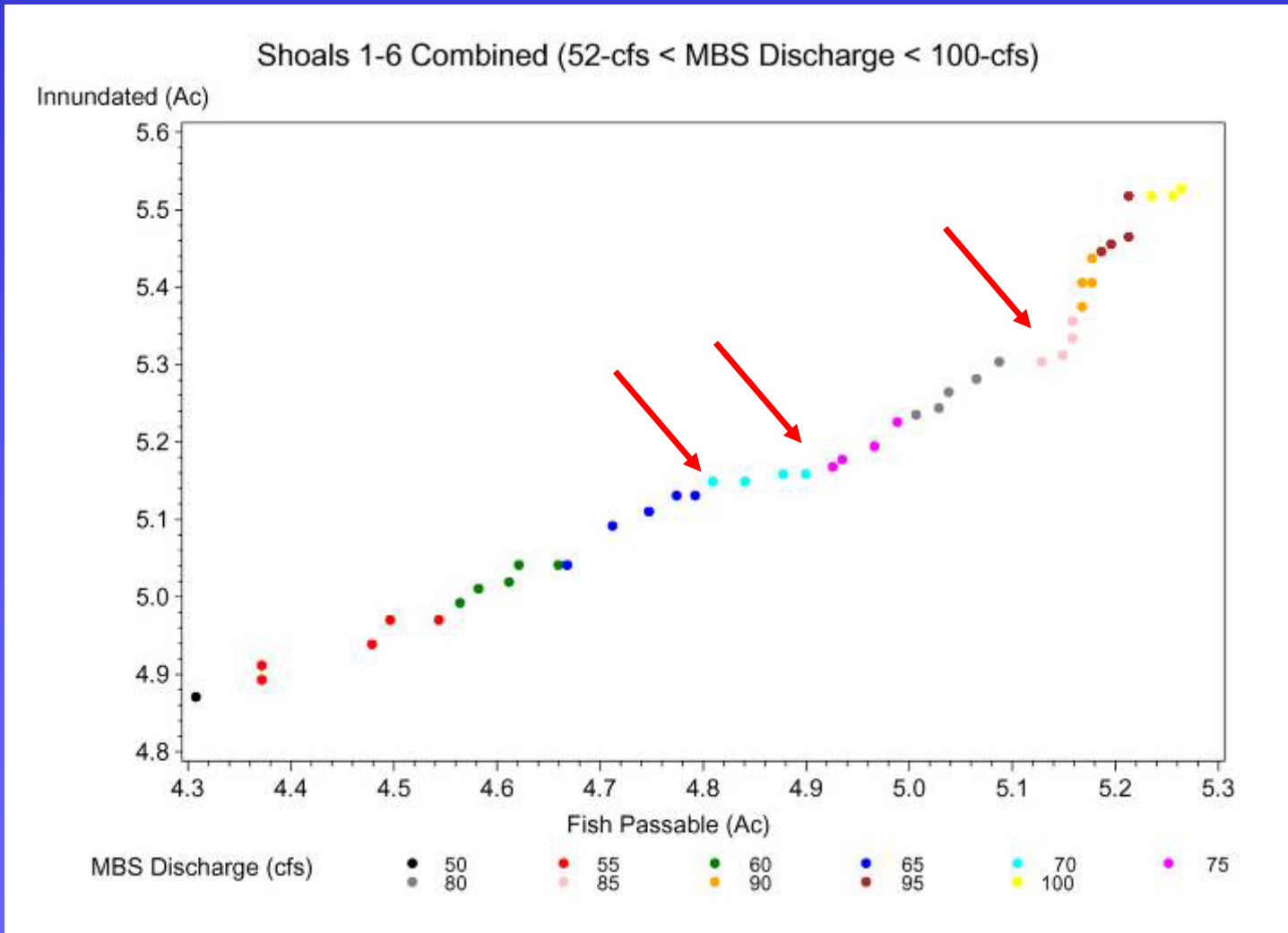
Downstream Shoals

**Shoal 6 – 9.02 miles from MBS -
Withlacoochee River Mile Marker**

2.74



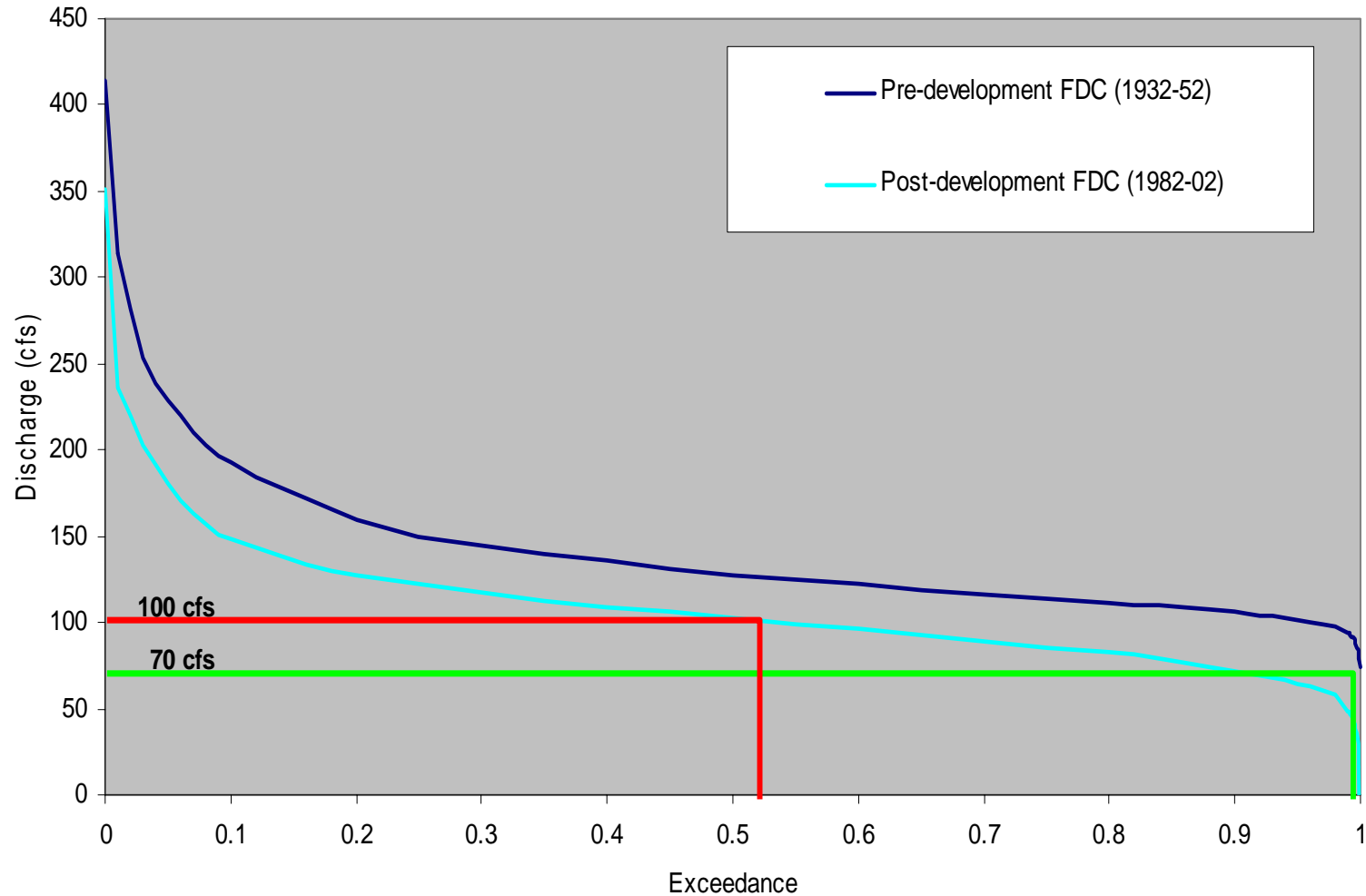
Shoal Passage and Inundation



Comparison of Shoal Habitat Areas

Minimum Flow Madison Blue (cfs)	Shoal Area Passable by Fish (acres)	Shoal Area Wetted (acres)	Difference from Historical Shoal Area Passable by Fish (acres)(%)	Difference from Historical Shoal Area Wetted (acres)(%)
70 cfs	4.8	5.1	-0.4 (-7.7%)	-0.3 (-5.6%)
85 cfs	5.1	5.3	-0.1 (-1.9%)	-0.1 (-1.9%)
100 cfs	5.2	5.5	0.0	+0.1 (+1.8%)

Consequences of 70 cfs MFL



Applicability to Ecological and Water Resource Values

Applicable Ecological & water Resource Values	Proposed Minimum Flow	Benefits Provided by Flow Requirements	Does 70 cfs MFL Meet or Exceed Value Flow Requirements?
<u>Fish and Wildlife Habitats and the Passage of Fish</u>	>70 cfs	Provides protection from significant harm to shoal habitat and fish passage in the Withlacoochee River	YES
<u>Maintenance of Freshwater Storage and Supply</u>	>70 cfs	Provides maintenance of existing permitted water use	YES
<u>Recreation in and on the Water</u>	>70 cfs minimum	Provides a full spring pool and flow in the spring run	YES
<u>Aesthetic and Scenic Attributes</u>	>70 cfs >100 cfs median	Provides a full spring pool and flow in the spring run and classification as a first magnitude spring	YES
<u>Water Quality</u>	NA	NA	NA

Recommendations

1. Adopt a minimum flow of 70 cfs for MBS applicable when the stage of the Withlacoochee River measured at the Pinetta gauge is 52 feet (NGVD) or less and which maintains a 100 cfs median flow for the MBS spring discharge.
2. Re-evaluate the MBS minimum flow five years after MFL adoption by incorporating additional data collected for related surface water, groundwater, ecological systems and water use within the springshed.

Next Steps

1. **Initiate the MBS MFL rule adoption process**
2. **Initiate water shortage rule adoption process**