

# Phase I System Characterization: Ecological Study of the South River and a Segment of the South Fork Shenandoah River, Virginia



# Overview

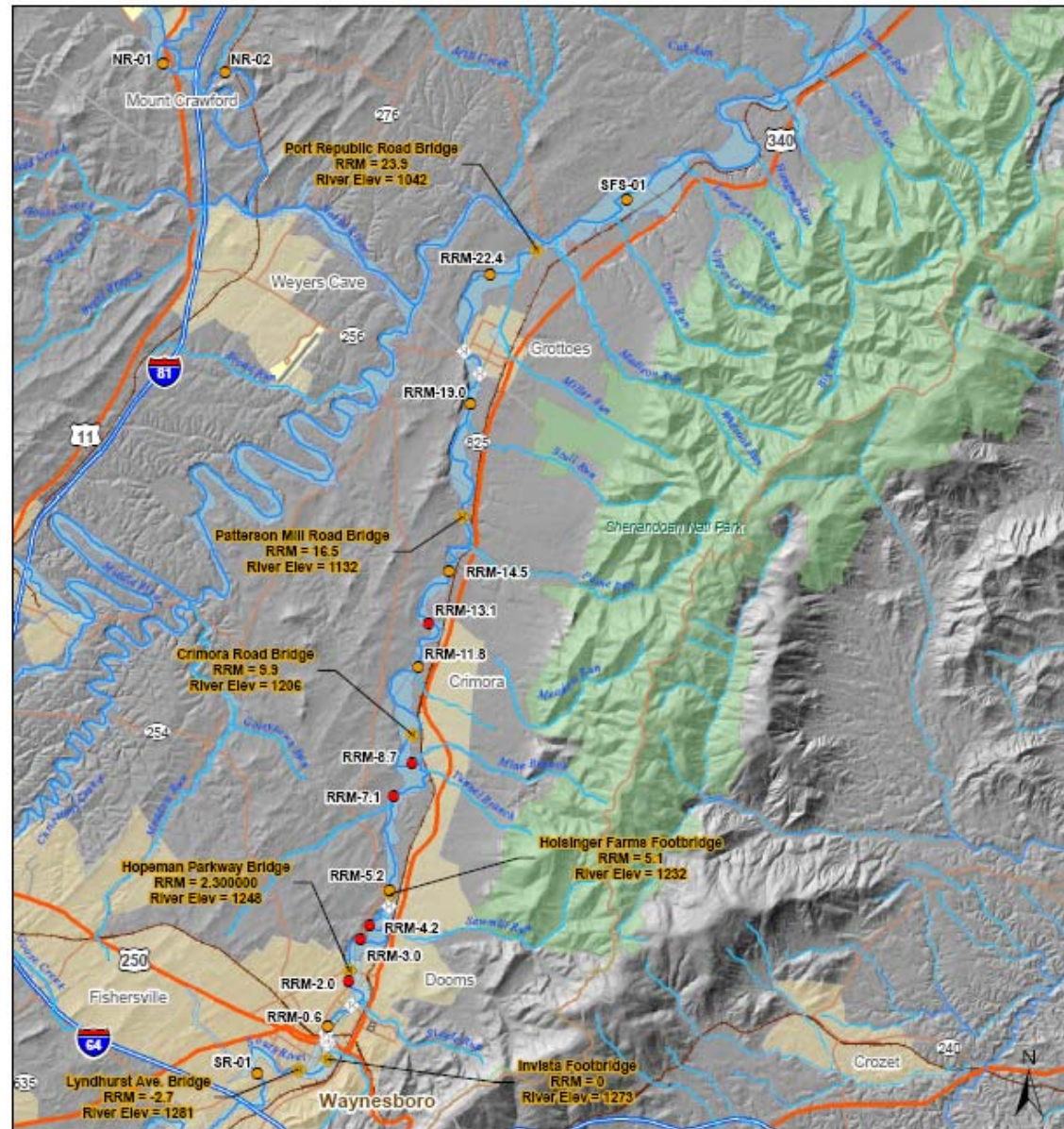
- o Update on March and April 2006 sampling events for Phase I Ecological Study.
  - o Methods
  - o Sampling progress
  - o Hydrological conditions
  - o Water quality data
  - o Fine-grained sediment storage



# Physical and Biological Assessment Locations

## Sampling Includes:

- o Monthly collections of surface water, sediment, and crayfish tissue
- o Quarterly collections of other biological tissue
- o Quarterly assessments of biological communities (fish biannually)





# Methodology



# Physical and Biological Assessment Progress

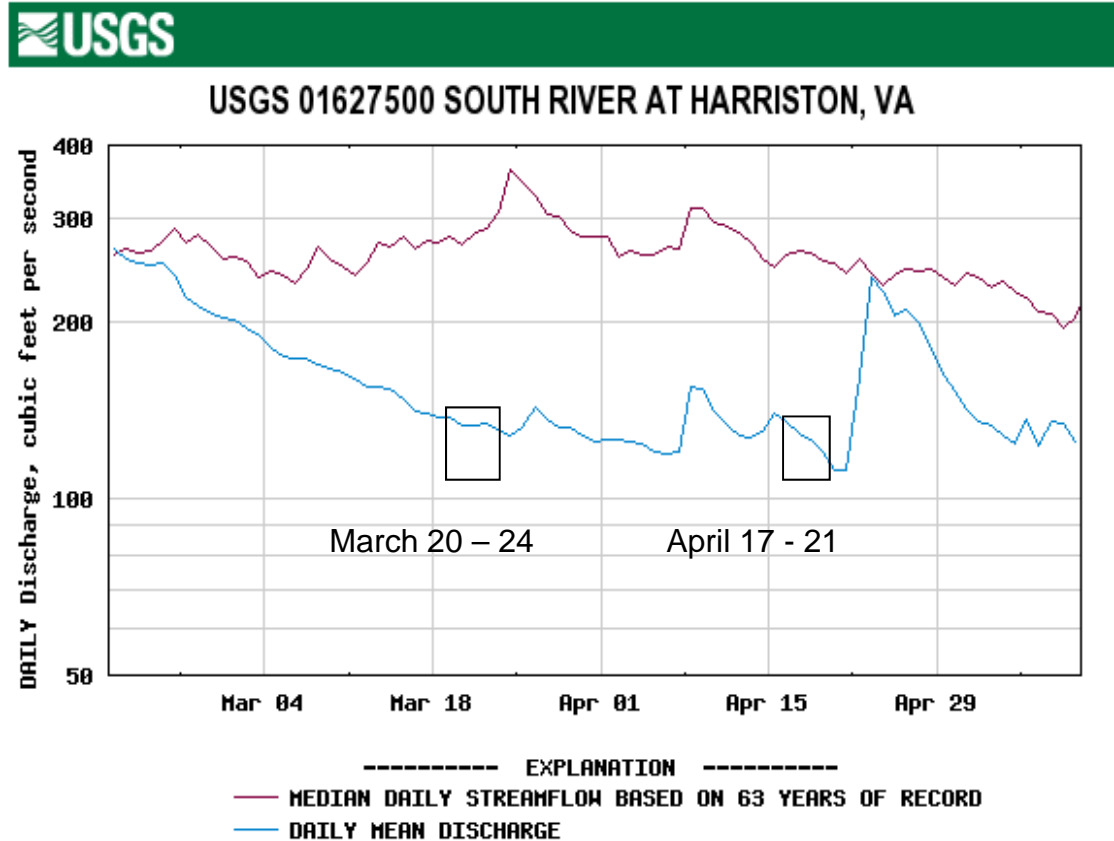
## Summary:

- o March and April 2006: monthly collections of surface water, sediment, and crayfish tissue
- o May 2006:
  - o Surface water and sediment
  - o Increased crayfish replication (n = 3)
  - o Additional biological tissue
  - o Community assessments at selected locations

Matrix/Type	March	April	May
<i>Physical Media</i>			
Surface Water	✓	✓	✓
Sediment	✓	✓	✓
<i>Biological Tissue</i>			
Filamentous algae			✓
Crayfish	✓	✓	✓
Corbicula			✓
Diptera			✓
Ephemeroptera			✓
Trichoptera			✓
Centrarchidae (Sunfish spp.)			✓
Cyprinidae (Minnows)			✓
Percidae (Darters)			✓
<i>Community Assessments</i>			
Aquatic Invertebrates			✓
Fish			✓

# Hydrologic Conditions

- o Flows for both events below the historical average at Harriston.
- o Peak in hydrograph brought flow to historical average, and did not satisfy requirements for storm event as defined in work plan.
- o Data collected in March and April indicative of base flow conditions.



# Water Quality Parameters

- o In general, similar water quality between study area and reference areas.
- o Water temperature increased in April.
- o Combined with similarities in physical habitat, reference areas appear to be well suited for comparison with study area.
- o Preliminary analytical data are generally consistent with other SRST data.

March and April 2006 Water Quality Parameters

Location	Water Temperature (°C)	pH	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)
March 2006 Averages				
Study Area	8.3	8.4	0.221	11.9
Reference Area	8.4	8.4	0.213	12.3
April 2006 Averages				
Study Area	14.6	8.2	0.190	10.4
Reference Area	13.2	8.0	0.113	10.3

March 2006 Ancillary Surface Water Parameters

	Hardness (mg/L)	TSS (mg/L)	SO <sub>4</sub> (mg/L)	NO <sub>3</sub> /NO <sub>2</sub> (mg/L)	PO <sub>4</sub> (mg/L)	TOC (mg/L)
Study Area						
Average	113	4.8	9.6	1.2	<0.25	1.7
s	14	4.0	1.2	0.2	<0.25	0
Minimum	102	0.87	8.8	0.88	<0.25	1.4
Maximum	158	16.2	13.1	1.9	<0.25	2.0
Reference Areas						
Average	114	3	11	1.9	<0.25	1.7
s	17	2	3	1.0	<0.25	0.3
Minimum	96.3	1.9	9.4	0.79	<0.25	1.5
Maximum	130	5.6	14.6	2.8	<0.25	2.0

s= Standard deviation

# Fine-Grained Sediment Storage in River Bed

- o Standardized sampling technique allows estimate of sediment storage in river bed.
- o Storage is higher in upstream reaches with lower gradients.
- o Storage was higher during March; rainfall in early April may have mobilized sediment.

