

Instream Flow Needs and Reservoir Elevation Progress Report
October 2007

Instream Flow Needs and Reservoir Elevations Update Report

**Claytor Project
FERC No. 739**

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1.0 Instream Flow Field Work

Habitat mapping was conducted along the entire study reach between Claytor dam and Glen Lyn from May 10 to 14, 2007. Average daily discharge during habitat mapping was 2,515 cubic feet per second (cfs) (ranging from 2,000 to 3,160 cfs) as measured at the U.S. Geological Survey (USGS) Radford gage and 4,285 cfs (ranging from 3,890 to 4,620 cfs) as measured at the USGS Glen Lyn gage.

At the request of the West Virginia Division of Natural Resources, additional habitat mapping was conducted between Glyn Lyn and Bull Falls (Bluestone reservoir) on July 27 and 28, 2007, to compare mesohabitat distributions relative to the upstream reach. Discharge during this mapping effort was similar to that observed during the previous mapping.

On July 26, representatives from Virginia Department of Game and Inland Fish took part in transect selection in the six proposed study sites. A total of 29 transects were selected, 6 of which are associated with islands and side channels (table 1). On August 3, an additional 4 transects were selected in the West Virginia portion of the study area. Table 1 also shows mesohabitat units selected to be represented by transects for the seven study sites between Claytor dam and Bluestone reservoir, New River, Virginia and West Virginia.

Between July 29 and August 7, low and middle flow discharge and water surface elevation data were collected on all transects (table 2). During this time, crews also initiated the process of profiling and substrate and cover coding transects. Coding and profiling were completed under low flow conditions in mid-September.

Dependent on flow conditions, high flow measurements will take place in late fall 2007 or spring 2008.

Table 1. Mesohabitat locations identified by site, habitat type, unit number (relative to habitat mapping database) and island association.

Study Site - #	Habitat Type	Unit #	Unit Length (ft)	Crosses Island?
Radford	Slow Riffle	43	531	
	Run	44	439	
	Deep Pool	46	328	
	Pool	53	606	
	Glide	54	1,070	
Whitethorne	Glide	143	2219	Yes
	Pool	144	660	Yes
	Pool	146	1,358	
	Glide	147	3,855	
Berton (Goodwins Ferry)	Pool	184	1,110	
	Run	186	119	Yes
	Glide	187	710	Yes
	Slow Riffle	192	440	

Study Site - #	Habitat Type	Unit #	Unit Length (ft)	Crosses Island?
Eggleston	Pool	193	507	
	Glide	211	839	
	Slow Riffle	212	273	
	Run	215	1,134	
	Pool	216	1,875	
Ripplemeade	Deep Pool	219	619	
	Slow Riffle	269	205	
	Run	270	305	
	Pool	271	465	
	Glide	272	636	
Rich Creek	Pool	273	416	
	Pool	376	1,181	
	Glide	377	904	
	Pool	378	801	
	Slow Riffle	382	177	Yes
West Virginia	Run	383	193	Yes
	Glide	138	589	
	Riffle	139	130	
	Run	140	647	
	Pool	142	768	

Table 2: Measured discharge for low and middle flow levels at seven study sites Claytor dam and Bluestone reservoir, New River, Virginia and West Virginia.

Study Site - #	Low Flow Discharge (cfs)	Middle Flow Discharge (cfs)
Radford	1,082	2,180
Whitethorne	1,284	2,153
Berton	1,173	2,198
Eggleston	1,173	2,198
Ripplemeade	1,290	2,270
Rich Creek	1,582	2,535
West Virginia	1,579	2,493

2.0 Hydrology/Indicators of Hydrologic Alteration

Daily and 15 minute streamflow information from USGS has been obtained for the following USGS gages:

- 03168000 New River at Allisonia
- 03170000 Little River at Graysontown
- 03171000 New River at Radford

- 03173000 Walker Creek at Bane
- 03175500 Wolf Creek near Narrows
- 03176500 New River at Glen Lyn

Fifteen minute interval data have been obtained from 1991 to present; daily data from these gages typically extends back at least 40 years. Additionally, flow records have been obtained from Appalachian Power Company for releases from Claytor dam at hourly intervals for the past 17 years. The Radford Electric Power Company has been contacted to obtain data on the releases from the hydropower dam on the Little River just above the confluence of the New River. During low flow conditions, pulse releases from the Radford hydropower plant are noticeable at the USGS gage on the New River at Radford about 5 miles downstream of the confluence with the Little River. Initial organization of the data for use in the Indicators of Hydrologic Alteration (IHA) and or PHABSIM time series analyses has begun.

3.0 Downstream Water Temperature Monitoring

To provide input and calibration data for the water temperature modeling, which will be used to determine the thermal effects of potential flow regimes on mussel populations, 16 water temperature dataloggers were placed in the New River between Claytor dam and Glen Lyn and within three significant tributaries. Figure 1 shows the locations of these monitors. Installation of these monitors occurred on May 17 and 18, 2007. These dataloggers have been checked, and data have been downloaded on a monthly basis. Four of the datalogger locations were dewatered during extreme low flow conditions at various times during the summer. Two of the monitors appear to have been thrown up on the bank out of the water by either high flows or humans. In these cases, the devices were moved slightly to more suitable locations. Figure 2 shows examples of some of the data collected during September.

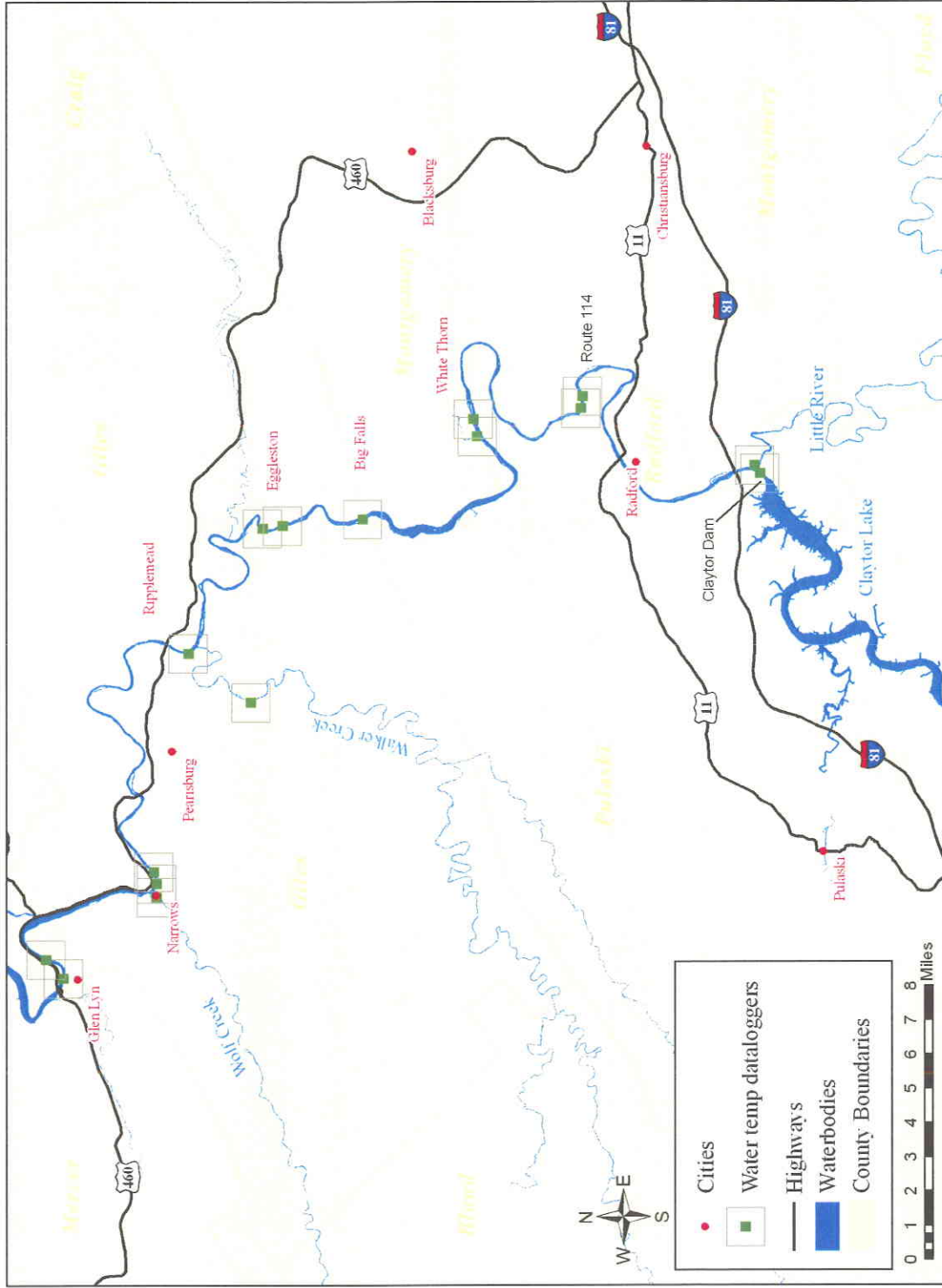


Figure 1. Location of water temperature dataloggers.

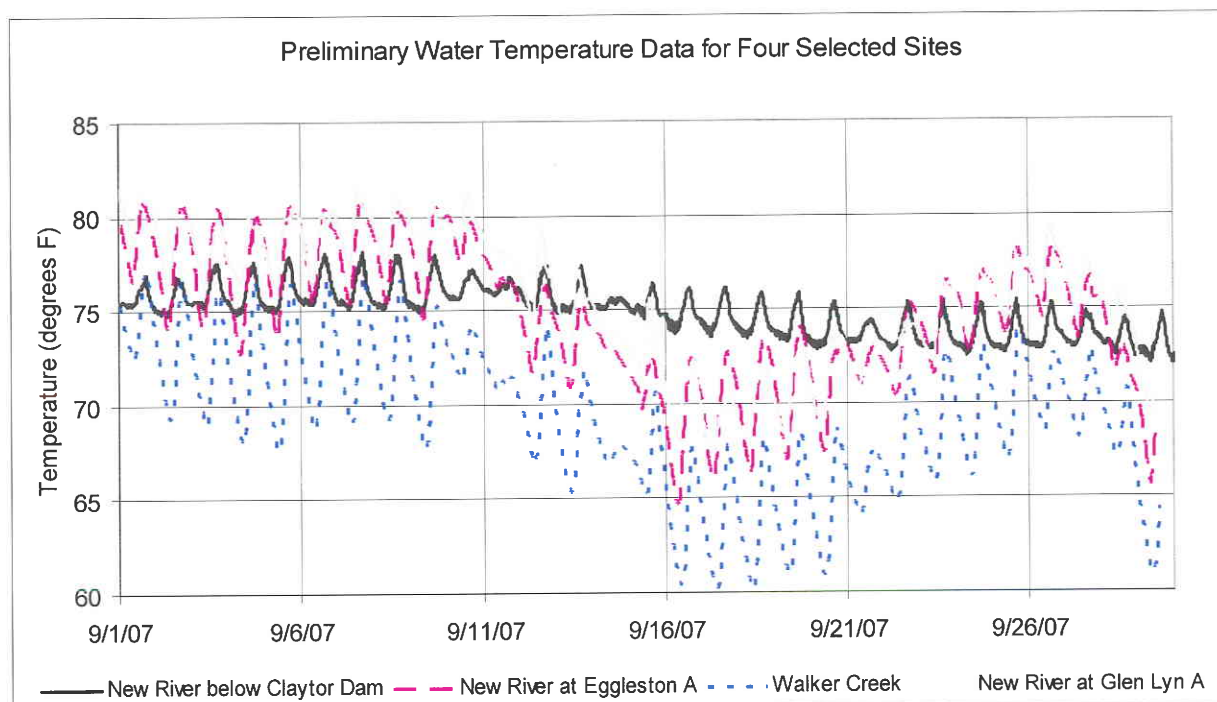


Figure 2. Preliminary water temperature data for selected locations for September 2007.

In addition to the water temperature dataloggers, air temperature and relative humidity data monitors were placed near the New River downstream of Claytor dam, near Big Falls, and near Glen Lyn. As well as providing data for the water temperature modeling, these air monitors also provide data on air temperature to help determine when the water temperature dataloggers were not in the water.

USGS monitors water temperature at 15 minute intervals at the Radford gage on the New River, as well as at the gages on Walker and Wolf creeks. Temperature data from these gages also have been obtained from USGS.

4.0 Reservoir Elevation and Dynamic Flow Modeling/Flow Information

Preliminary information has been gathered for these two tasks. After further progress is made on the IHA/Hydrology tasks and the data from the high flow measurements during the Instream Flow field work are obtained, additional work on reservoir elevation and dynamic flow modeling will be performed.

All tasks are currently on schedule for completion in 2008.