GRANT TITLE: **PROMOTING STRATEGIC FISH HABITAT CONSERVATION THROUGH REGIONAL AND COLLABORATIVE SCIENCE AND PRIORITY SETTING**

CONTRACT NUMBER: 019-0501

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The Atlantic Coastal Fish Habitat Partnership (ACFHP), Eastern Brook Trout Joint Venture (EBTJV), and Southeast Aquatic Resources Partnership (SARP) continued their multi-year collaborative focus on whitewater to bluewater fish habitat connectivity needs spanning the geographic boundaries of the three Eastern FHPs.

Objective: To collaboratively identify subwatersheds (HUC12) with the highest priority need for addressing fish habitat fragmentation; enable necessary road-stream crossing assessment; and, communicate the vital linkages between connectivity improvements and fish habitat rehabilitation.

Action: Determine locations with the highest priority need for enhancing or restoring fish habitat connectivity.

Summary of the Eastern Brook Trout Joint Venture Accomplishments

Habitat fragmentation can strongly influence the sustainability of wild Brook Trout populations by limiting their dispersal, thereby reducing gene flow, and preventing access to critical habitats that support different phases of their life history. To remediate habitat fragmentation, the Eastern Brook Trout Joint Venture collaborates with key partners to establish priority focus areas where anthropogenic fish passage barriers are identified as a primary threat to conserving wild Brook Trout and facilitates the elimination of impassable barriers within priority areas by providing support to regional and local groups.

From previous work, the Rivanna drainage (02080204) in Virginia was selected as a priority fish habitat connectivity focus area for the three Eastern Fish Habitat Partnerships (ACFHP, EBTJV, and SARP). From a Brook Trout perspective, the Eastern Brook Trout Joint Venture has identified four subwatersheds (HUC12) in the Rivanna drainage that collectively contain twenty-three catchments where wild Brook Trout are present (Table 1). Twenty-one of these catchments contain wild Brook Trout only (Catchment Classification Code 1.1 or 1.1P), while two contain wild Brook Trout and wild Rainbow Trout (Catchment Classification Code 1.3 or 1.3P) (Table 2). Additionally, the Eastern Brook Trout Joint Venture has grouped contiguous catchments occupied by wild trout into patches. The twenty-three catchments containing wild Brook Trout in the Rivanna drainage are located within four patches (Table 3). The Eastern Brook Trout Joint Venture has also determined the level of a patch's vulnerability to climate change, which is predicated on its sensitivity, defined as predicted changes in water temperature per unit increase in air temperature, and exposure, defined as the predicted frequency, magnitude and duration of water temperatures over a range of temperatures. The four Brook Trout Habitat Patches in the Rivanna drainage all have high sensitivity and high exposure and so they are highly vulnerable to the negative effects caused by climate change. All of the aforementioned data are readily

accessible in the Eastern Brook Trout Joint Venture's Brook Trout Integrated Spatial Data and Tools.

According to the North Atlantic Aquatic Connectivity Collaboration (NAACC), the four Wild Brook Trout Habitat Patches in the Rivanna drainage collectively have seventy-nine road-stream crossings (Appendix I). While the NAACC database indicates none of these road-stream crossings in the these Wild Brook Trout Habitat Patches have been assessed to determine if they obstruct fish movement, the Road-Stream Crossing Data from Trout Streams in this area of the Rivanna drainage indicates that fourteen road-stream crossings have been evaluated to determine if they are barriers to fish passage (Table 4). Ten of the assessed road-stream crossing are not physical barriers to fish movement, one is a minor barrier and three are moderate barriers.

The NAACC also developed a process for prioritizing HUC12s for road-stream crossing surveys. Table 5 contains the results of this prioritization process for the four HUC12s containing wild Brook Trout patches in the Rivanna drainage. Based on the NAACC approach the North Fork Moormans River-Moormans River HUC12 has been designated as the highest priority for assessing road-stream crossings among the four HUC 12s and the Swift Run HUC12 has the lowest.

The Eastern Brook Trout Joint Venture recently revised its range-wide habitat goals, based on the results of an assessment of wild Brook Trout status at the catchment scale, and two of the four goals focus on habitat connectivity (see Eastern Brook Trout Roadmap to Conservation). As such, the Eastern Brook Trout Joint Venture is firmly committed to supporting the assessment of the road-stream crossings in those Wild Brook Trout Habitat Patches located within the Rivanna drainage. Our Fish Habitat Partnership is in agreement with NAACC road-stream prioritization process designating the North Fork Moormans River-Moormans River HUC12 as the highest assessment priority followed by Doyles River HUC12, the Lynch River-North Fork Rivanna River HUC12, and the Swift Run HUC12, in descending order of priority.

Table 1. Subwatersheds (HUC12) within the Rivanna Drainage Containing Wild Brook Trout

Subwatershed Name	Subwatershed Code	Number of Catchments Containing Wild Brook Trout
North Fork Moormans River-Moormans River	020802040103	6
Doyles River	020802040104	7
Lynch River-North Fork Rivanna River	020802040301	4
Swift Run	020802040302	6

Table 2. Catchments within the Rivanna Drainage Containing Wild Brook Trout

North Fork Moormans River-Moormans River

Catchment Feature ID	Catchment Classification Code
8566529	1.1
8566531	1.1P
8566587	1.1
8566663	1.1P
8567113	1.3P
8567117	1.3

Doyles River

Catchment Feature ID	Catchment Classification Code
8566453	1.1P
8566463	1.1P
8566467	1.1P
8566475	1.1P
8566485	1.1P
8566567	1.1
8567103	1.1P

Lynch River-North Fork Rivanna River

Catchment Feature ID	Catchment Classification Code
8566447	1.1P
8566419	1.1
8567091	1.1
8567093	1.1P

Swift Run

Catchment Feature ID	Catchment Classification Code
8566387	1.1
8566389	1.1P
8566391	1.1P
8566393	1.1P
8567081	1.1
8567083	1.1

Table 3. Wild Brook Trout Habitat Patches within the Rivanna Drainage

Subwatershed Name	Wild Brook Trout Habitat Patch Feature ID
North Fork Moormans River-Moormans River	8567189.0
Doyles River	8566567.0
Lynch River-North Fork Rivanna River	8566447.0
Swift Run	8567083.0

Table 4. Road-Stream Crossing Data from Trout Streams within the Rivanna Drainage.

Doyles River

Name of Road	Structure ID	Crossing ID	Physical Barriers to Fish
Browns Gap Turnpike	---	377	(Bridge)

Lynch River-North Fork Rivanna River

Name of Road	Structure ID	Crossing ID	Physical Barriers to Fish
Mission Home Road	365	364	Moderate
Simmons Gap Road	367	366	None
Broken Back Mountain Road	369	368	None
Simmons Gap Road	371	370	None

Swift Run

Name of Road	Structure ID	Crossing ID	Physical Barriers to Fish
Golden Horseshoe Road	313	312	None
Goose Pond Road	315	314	None
Mutton Hollow Road	341	340	None
Mutton Hollow Road	339	335	None
Mutton Hollow Road	334	331	Moderate
Mutton Hollow Road	330	326	None
Mutton Hollow Road	325	324	None
Mutton Hollow Road	323	322	Moderate
Mutton Hollow Road	321	320	Minor

Table 5: NAACC Prioritization Results for Road-Stream Crossing Surveys in Four HUC12s within the Rivanna Drainage.

HUC12 Name	Result Priority*	Brook Trout: EBTJV - Categorical Area Weighted Avg.**
North Fork Moormans River- Moormans River	Tier 5	2.19
Doyles River	Tier 6	2.24
Lynch River-North Fork Rivanna River	Tier 6	1.62
Swift Run	Tier 19	1.00

*Tier 1 = Highest Priority, Tier 20 = Lowest Priority
**4 = highest priority, 0 = lowest priority

Appendix I: Listing of Road-Stream Crossings in Four Wild Brook Trout Patches within the Rivanna Drainage.

North Fork Moormans River

Road	# of Crossings	NAACC Crossing Code
Sky Line Drive	1	xy3820960078746924
Black Rock Gap Road	11	xy3820519878749243
		xy3819478678733424
		xy3818770978737062
		xy3818627178738046
		xy3818374878738762
		xy3817873578741106
		xy3816563978745144
		xy3815681878748647
		xy3814970478748681
		xy3814800778748602
		xy3813898178749830
Sugar Hollow Road	1	xy3812927978723996

Doyles River and Tributaries

Road	# of Crossings	NAACC Crossing Code
Headquarters Lane	1	xy3821240278679125
Browns Gap Turnpike[1]	7	xy3820781078674145
		xy3819818078670755
		xy3817188878675105
		xy3816144078673538
		xy3815491378670012

		xy3814728278668474
		xy3813843078663925
Blackwells Hollow Road	2	xy3820295778671384
		xy3820302478668914
Unnamed Road #1	1	xy3819910478671499
Unnamed Road #2	2	xy3819759778666608
		xy3819667478669796
Unnamed Road #3	1	xy3819187978667708
Doyles River Crossing	1	xy3819157178667559
Doyles Side Lane	1	xy3819034378667213
Unnamed Road #5	1	xy3818154878670155
Steppe Howard Lane	1	xy3818019778670645
Unnamed Road #6	1	xy3817599578672248
Batten Road	2	xy3819069578689381
		xy3818678978685616
Fox Mountain Road	1	xy3816976278674357
CCC Road	1	xy3817651178683459
Slam Gate Road	4	xy3816492178675795
		xy3816038478681142
		xy3815882978687679
		xy3815690578685683
Old Ice Pond Road	1	xy3816152978682717
Blufton Road	1	xy3815102378666985
Mt Air Farm	1	xy3814869878667845
Unnamed Road #7	1	xy3814672178659124

Via Lane	1	xy3816610278701125
Unnamed Road #8	1	xy3816308878698578
Unnamed Road #9	1	xy3816136778693934
Break Heart Road	2	xy3813884978680305
		xy3813835478665031
Clark Road	1	xy3813571778661725

[1] One road-stream crossing is a bridge.

Ivy Creek, Lynch River, and Tributaries

Road	**# of Crossings**	**NAACC Crossing Code**
Simmons Gap Fire Road	1	No code
Unnamed Road #1	1	No code
Route 601	1	No code
Unnamed Road #2	1	No code
Mission Home Road[2]	1	No code
Simmons Gap Road[3]	3	No codes
Route 614	1	No code
Broken Back Mountain Road[4]	1	xy3824872878583398
Boonesville Road	1	xy3824318078575185
Dyke Road	1	xy3823690878542623
Plunkett Road	1	xy3822485478520871
Whilhoit Farm Road	1	xy3821564878497024

[2]Already assessed-moderate barrier to fish movement.
[3]Two road-stream crossings have already assessed and both are not barriers to fish movement.
[4] Already assessed-not a barrier to fish movement.

Swift Run and Tributaries

Road	# of Crossings	NAACC Crossing Code
Golden Horseshoe Road[5]	1	No code
Goose Pond Road[6]	1	No code
Mutton Hollow Road[7]	7	No codes
Dyke Road	1	No code
Garth Road	1	No code
Celt Road	1	No code
Keith Road	1	No code
Amicus Road	1	No code
Durrett Ridge Road	1	No code

[5,6]Already assessed-not barriers to fish movement.

[7]Already assessed-four road-stream crossings are not barriers to fish movement, one is a minor barrier to fish movements, and two are moderate barriers to fish movements.