

It Truly Takes a Whole Village: Collaboration by Agencies and Industry to Restore American Eels to the Upper Roanoke River Basin

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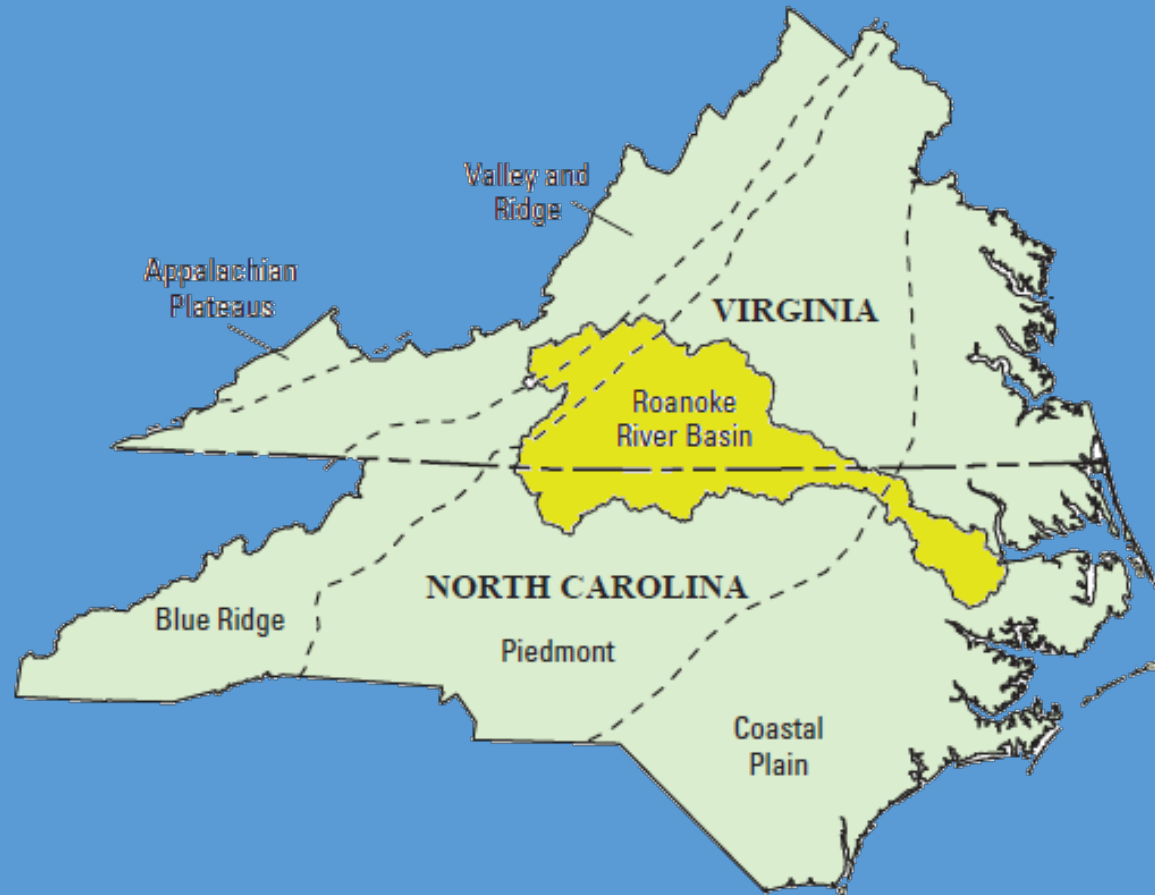
By the Diadromous Fish Restoration Technical Advisory Committee, American Eel
Working Group:

Wilson Laney (presenter), for Karen Canody, Corey Chamberlain, John Ellis, Jesse Fischer, Bob Graham, Tom Kwak, Todd Mathes, Jeremy McCargo, Dan Michaelson, Jason Rock, Fritz Rohde, Kirk Rundle, Scott M. Smith, Peter Sturke, Chad Thomas, Jason Williams [and more current and historical members]

Presentation Outline

- Background: Roanoke River Basin Distinctives and American Eels
- Processes: Corps 216 (b) Study, FERC Relicensing, Settlement, TNC/COE Sustainable Rivers Program
- Post-Licensing Adaptive Management and Collaboration
- Critical Element: Professional and Personal Relationships
- Villagers, Past and Current
- Outcome to Date
- Future Challenges
- Acknowledgements

Roanoke River Basin

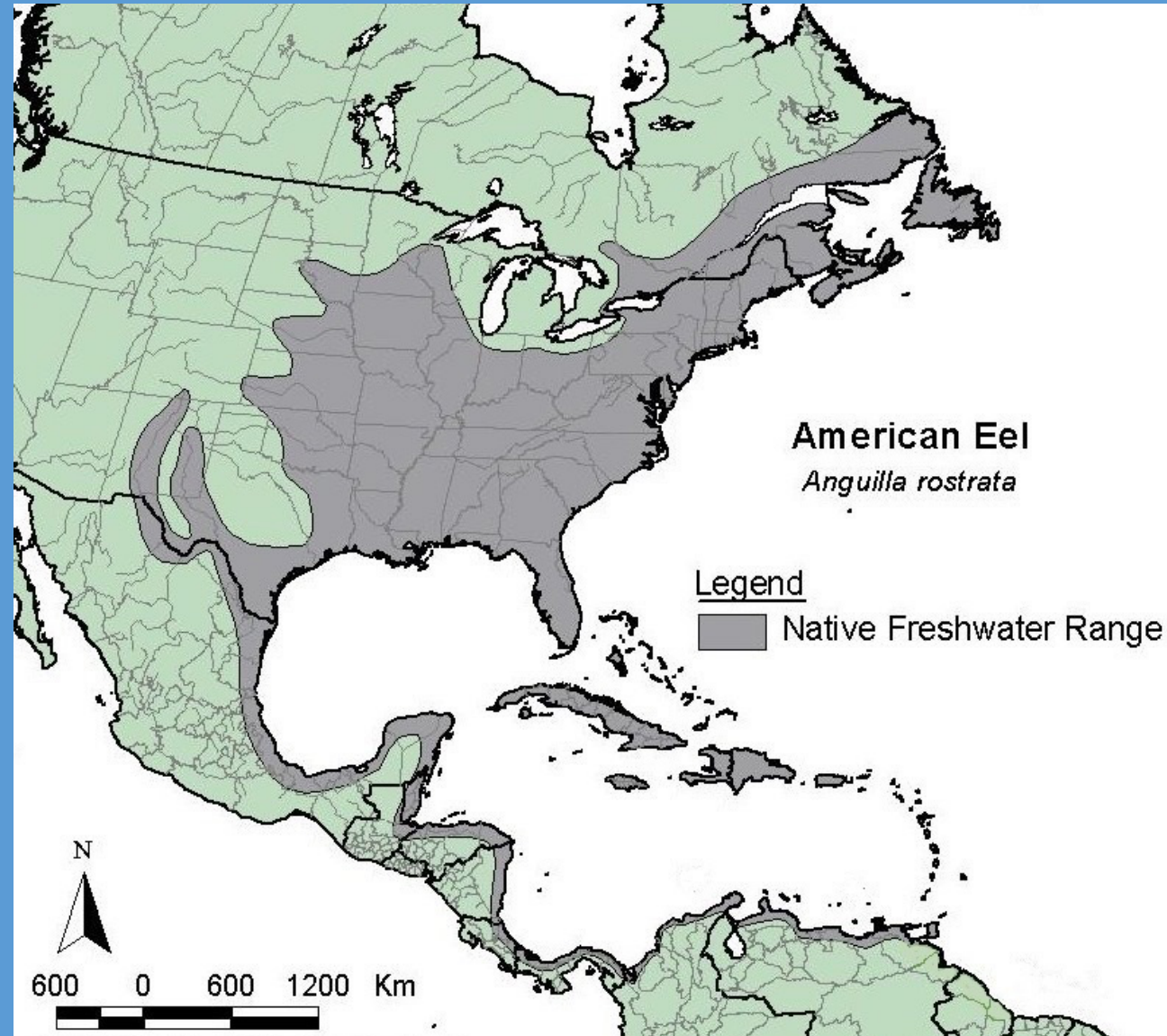


Roanoke River Basin Fish Fauna and Value

[Citation: Jenkins, R.E. and N.M. Burkhead. 1993. Freshwater fishes of Virginia. American Fisheries Society, Bethesda, Maryland. 1,079 pp.]

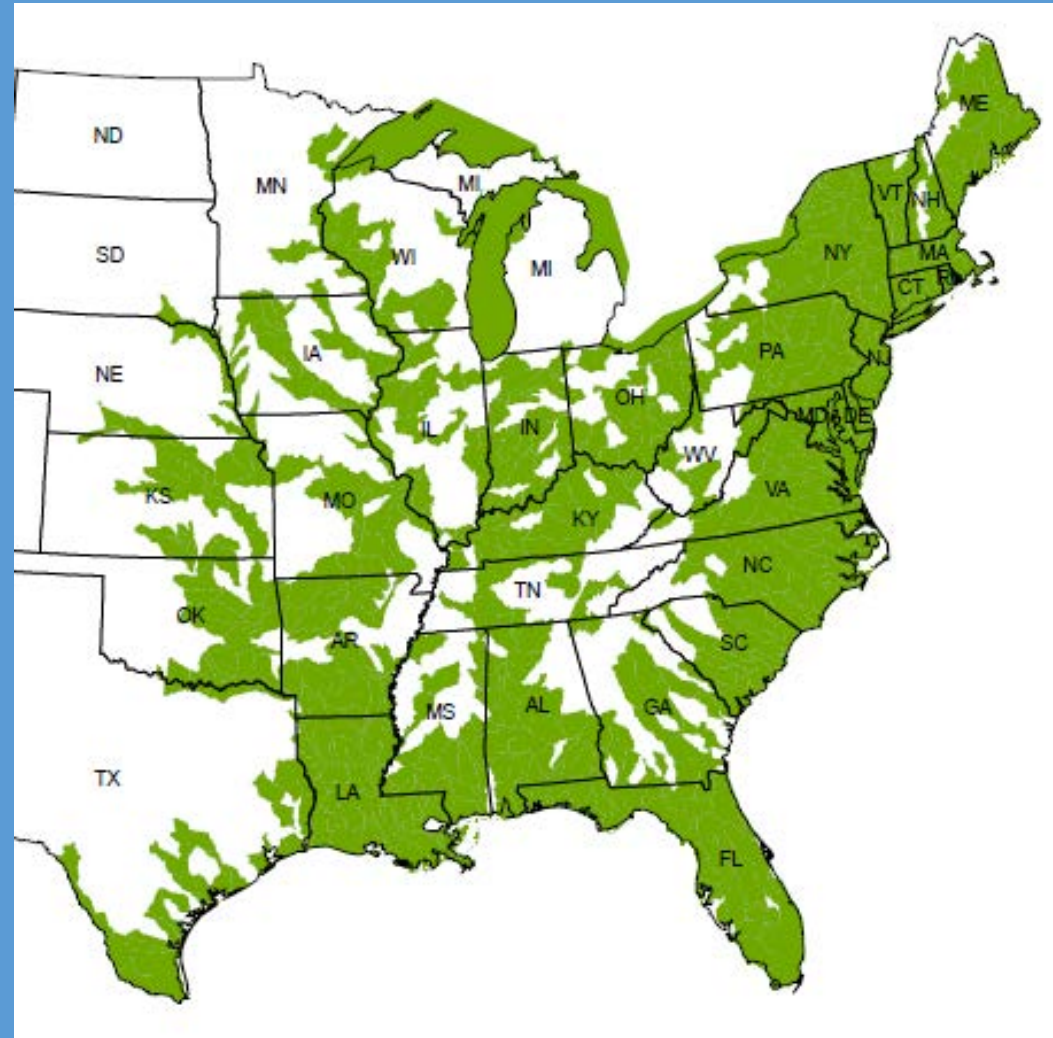
- Page 77: "The native Roanoke fauna has been considered the most speciose and distinctive on the Atlantic slope of the United States south of the St. Lawrence drainage (Jenkins et al. 1972)." This is the case because of its "...higher numbers of endemic taxa and range terminations in and adjacent to the drainage."
- Page 205: "Owing only partly to its catadromous strategy, the American eel occupies perhaps the broadest diversity of habitats of any fish species (Helfman et al. 1987)."
- AND, The Nature Conservancy designated the lower Roanoke River Basin as one of the "Last Great Places." [TNC and SARP. 2005. The Roanoke River Conservation Plan. TNC, North Carolina. 61 pp.]

American Eel Native Distribution



Distribution of American Eel, 2015

[From Shepherd (2015) American Eel Species Biological Report]



Historical Roanoke River American Eel Distribution

[Citation: Jenkins, R.E. and N.M. Burkhead. 1993. Freshwater fishes of Virginia. American Fisheries Society, Bethesda, Maryland. 1,079 pp.]

- Page 78: "Five main-stem reservoirs, created within the period 1952-1964, have obliterated more than half of the Piedmont-Fall Zone reach of the Roanoke River and the lowermost Dan River...."
- Page 206: "Eels are sometimes able to surmount such structures [dams] but the serial nature of dams acts additively; progressively fewer eels ascend each successive dam."
- Page 206: "The obstructiveness of large dams is evident also in the Roanoke drainage; the concentration of records in the upper Roanoke is a matter of history. Perhaps the first dam to stop eels is the modest (16 m high) Niagara Dam built across the Roanoke River just below Roanoke in 1906." "The last eel report is from about 1940 (Jenkins and Freeman 1972)."
- Page 206: "The virtual, if not complete, loss of the American eel from the first three major Roanoke River tributaries below Roanoke--Back Creek, Blackwater River, and Pigg River--has resulted from more recent construction of two sets of large dams on the Roanoke River."

Roanoke River Basin with Major Dams



Chronology of Roanoke River Habitat Alteration/Fragmentation by Major Dams

- John H. Kerr Dam, Roanoke River mainstem (U.S. Army Corps of Engineers; flood control and hydropower)– 1953
- Philpott Dam, Smith River mainstem (Dan)(U.S. Army Corps of Engineers; flood control and hydropower)--1953
- Roanoke Rapids Dam, Roanoke River mainstem (Dominion; hydropower)--1955
- Gaston Dam, Roanoke River mainstem (Dominion; hydropower)-- 1963
- Leesville Dam, RR mainstem (Appalachian Power; pumped storage)-- 1963
- Smith Mountain Dam, RR mainstem (Appalachian Power; hydropower)--1963
- Hyco Dam, Hyco River tributary (Duke Energy; cooling reservoir)--1965
- Belews Dam, Belews Creek tributary to Dan River tributary (Duke Energy; cooling reservoir)-- 1973

Opportunities for Habitat Enhancement and Restoration of Access: COE, FERC and TNC Processes

- Gaston/Roanoke Hydropower FERC Relicensing (Dominion Energy)
 - Scoping began 1994
 - Application filed 1999
 - Comprehensive Agreement, July 2003
 - FERC issues new license with articles inconsistent with agreement, 2004
 - Applicant and stakeholders request rehearing, 2004
 - Technical conference held, June 2004
 - New amended license, March 2005
- Settlement Negotiations: concurrent with relicensing
- Corps/TNC Sustainable Rivers Program: included Roanoke River, 1998-2020
- John H. Kerr 216(b) Study, Wilmington District COE: 1996-2016
 - Initial Appraisal Report 1996
 - Congress directed 216 in 2000
 - Reconnaissance Report Completed 2001
 - Study initiated and continued through 2014
 - Quasi-Run-of-River flow regime implemented June, 2016

Post-licensing Adaptive Management and Implementation

- Cooperative Management Teams (CMT) for 216 Study and FERC license adaptive measures related to peaking; floodplain ecology and flows; developing flows for the bypass reach
- Diadromous Fish Restoration Technical Advisory Committee (DFRTAC) for diadromous restoration, including passage and water quality, etc.
 - American Eel Working Group (AEWG)
 - American Shad Working Group (ASWG)

To learn more about the processes and how it all worked see:

Manring, Susan L. and Sam Pearsall. 2004. Creating an Adaptive Ecosystem Management Network among Stakeholders of the Lower Roanoke River, North Carolina, USA. *Ecology and Society* 10(2):16

Attributes of the Village Team

[My personal list of 12 developed August 15, 2018]

- **Acknowledge and respect each others' missions; but seek common ground (goals, objectives)**
- **Negotiate in good faith and recognize constraints/limitations**
- **Communicate, communicate, and communicate some more**
- **Spend quality social time together (i.e., angling; consumption of copious amounts of bite-size powdered sugar doughnuts, barbecue and pizza, etc.; help each other with field sampling)**
- **Trust each other's information, but it's okay to ask questions and verify**
- **Be objective when considering opinions and options, and freely share ideas**
- **Underwrite everything you do with the best available science, and share new science**
- **Try to provide as much certainty as possible for all stakeholders**
- **Don't be afraid to be adaptive, especially in the face of uncertainty (USFWS SHC approach)**
- **Follow through on commitments**
- **Really try to think outside the box**
- **Make decisions by consensus, whenever possible (actually a settlement provision)**

Five Must-have Attributes of Every Successful Team

[D. Sturt and T. Nordstrom. 2013. O.C. Tanner Institute.]

- Clear vision
- Inspiring leader
- Team cooperation
- Constructive communication
- Appreciation all around

Seven Qualities of a Successful Team

Here are a few qualities that a successful team possesses:

- 1) They communicate well with each other. ...
- 2) They focus on goals and results. ...
- 3) Everyone contributes their fair share. ...
- 4) They offer each other support. ...
- 5) Team members are diverse. ...
- 6) Good leadership. ...
- 7) They're organized. ...
- 8) They have fun.

FROM: Top 7 Qualities of a Successful Team - Undercover Recruiter
<https://theundercoverrecruiter.com/qualities-successful-work-team/>

10 Qualities of a Truly Great Team

[Vorkspace Blog; Wendy Soon (2013)]

- Trust
- Embraces different ideas and opinions
- Is not afraid to challenge
- Cooperates
- Contains no procrastinators
- Is committed
- Is respectful of one another
- Supports each other to get things going
- Shares openly and willingly
- Knows other team members beyond a professional level

Historical Villagers (aka Stakeholders) Participants in the FERC and COE Processes

- Signatories to the Settlement Agreement
 - The Applicant (Dominion Energy)
 - Two Federal Agencies (NMFS, USFWS)
 - Six State of North Carolina Agencies (NCDEQ, NCDMF, NCDWR, NCDFR, NCSHPO, NCWRC) and one NC Department (NCDENR)
 - Four Commonwealth of Virginia Agencies (VADCR, VADEQ, VDGIF, VASHPO)
 - Two Municipalities (Roanoke Rapids, Virginia Beach)
 - One NGO (The Nature Conservancy)
 - Three Associations (LGA, RPLG, RRBA)
- Corps of Engineers and FERC as participants but not signatories

Current DFRTAC/AEWG Villagers

FERC License No. 2009

Roanoke Rapids, NC

- Dominion Energy – licensee
- Diadromous Fish Restoration Technical Advisory Committee (DFRTAC)
 - Dominion Energy
 - NMFS
 - USFWS
 - USGS, NC Cooperative FWR Unit
 - NC Wildlife Resources Commission
 - NC Department of Environmental Quality
 - NC Division of Marine Fisheries
 - NC State University
 - VA Department of Game and Inland Fisheries



Roanoke River Outcomes

- Establishment of high-functioning technical teams (DFRTAC, AEWG, ASWG)
- Pre-eelway sampling highly beneficial
- Eelways design, construction and operation highly successful
- Millions of American Eels moved upstream, safely, timely and effectively
- Partial restoration to upper Roanoke of ecological services provided by American Eels (prey function, predator function, mussel host function, etc.)
- Downstream and upstream age, growth and parasite studies, NCSU, USGS, Dominion (with thanks to ASMFC)
- Tagging and tracking study by Pacific NW National Lab, acoustic microtransmitters
- Numerous graduate degrees done on the Roanoke River associated with the project
- Beneficial and collegial working relationships
- Professional and technical contributions to the management community (as evidenced by four presentations in this symposium)

Future Challenges and Needed Research

- How many American Eels are enough? Too many? Or, is that an irrelevant question, i.e., we should build it and pass ALL that come? (USFWS is working on this one, at least trying to estimate the amount of possible American Eel habitat in Roanoke Rapids Reservoir, and then using natural American Eel densities from undammed streams, see if we have come anywhere close to estimated carrying capacity)
- Measuring Eelway Capture Efficiency (anybody have any ideas we haven't tried?)
- Safe, timely and effective downstream passage (literature survey is completed; some ideas have been discussed; but how do we implement?)
- Is there any measurable impact of the exotic air bladder parasite on upstream ecosystems not previously exposed to it?

Acknowledgments

- Thanks to my unnamed employer for allowing me to work for so many decades on fascinating diadromous species and being a part of several interjurisdictional fisheries and fishery management institutions
- Thanks to many of the subject matter experts (including the ASMFC American Eel Technical Committee) that we called for counsel and advice through the years, and who we will call into the future, thanks in advance
- Thanks to ASMFC for allocating funding to the USFWS which has been and is being used to support the American Eel studies on the Roanoke and Pee Dee rivers
- Thanks to Dominion Energy for supporting all the teams and all the stakeholders during relicensing and settlement, with food and meeting venues
- Thanks to all of this presentation's co-authors for their reviews and refinements to this presentation
- AND, thanks much to all of the VILLAGERS working for all of the participants in the processes for all of their support, dedication and passion through the years

Questions for Any of the Village People?

