



# How a Long-term Collaborative Effort with Multiple Partners Helped Restore and Protect the Integrity of a Bottomland Hardwood System on a Dam-Regulated River

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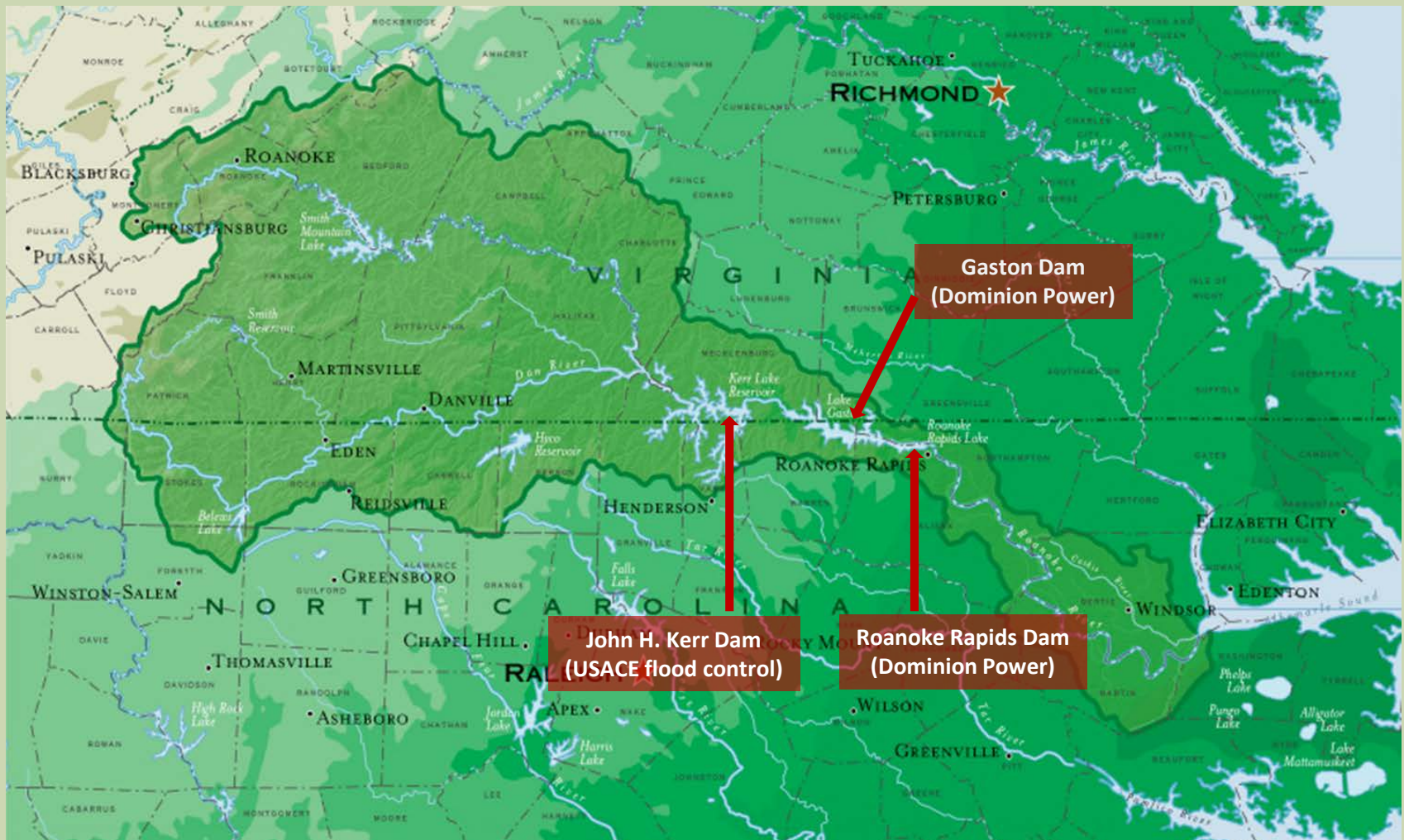


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# Roanoke River Basin



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# Significant Natural Resources



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# Important Features of the Roanoke River

- Important to migratory diadromous fish species including alewife, American eel, American shad, Atlantic sturgeon, blueback herring, hickory shad, sea lamprey, and striped bass.



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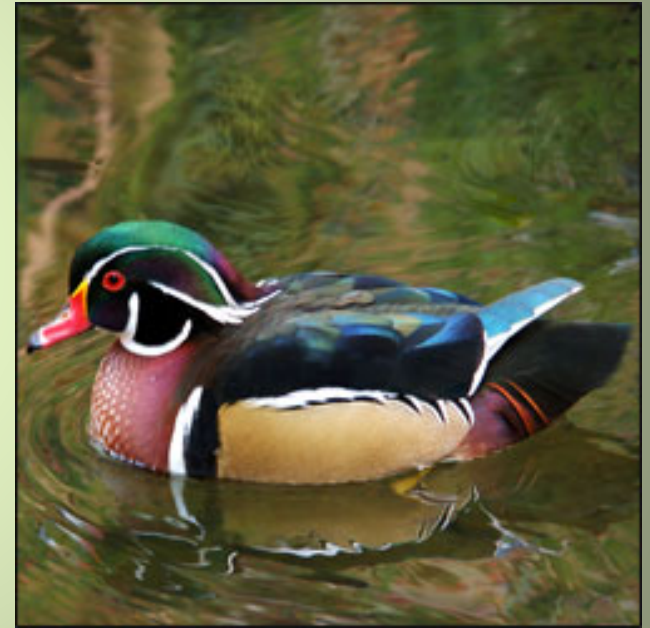




# Important Features of the Roanoke River



- Migratory waterfowl, primarily Mallards and Wood Ducks;



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# Important Features of the Roanoke River



- Important forest dwelling birds including Bald Eagles, Swainson's Warbler, Kentucky Warbler, Wood Thrush, Mississippi and Swallow-tailed Kites, Prothonotary Warbler and Cerulean Warbler;



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# Important Features of the Roanoke River



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# Conservation Interests in the System

- North Carolina Wildlife Resources Commission
- The Nature Conservancy
- U.S. Fish and Wildlife Service
- U.S. Department of Agriculture
- N.C. Department of Environmental Quality, Division of Mitigation Services

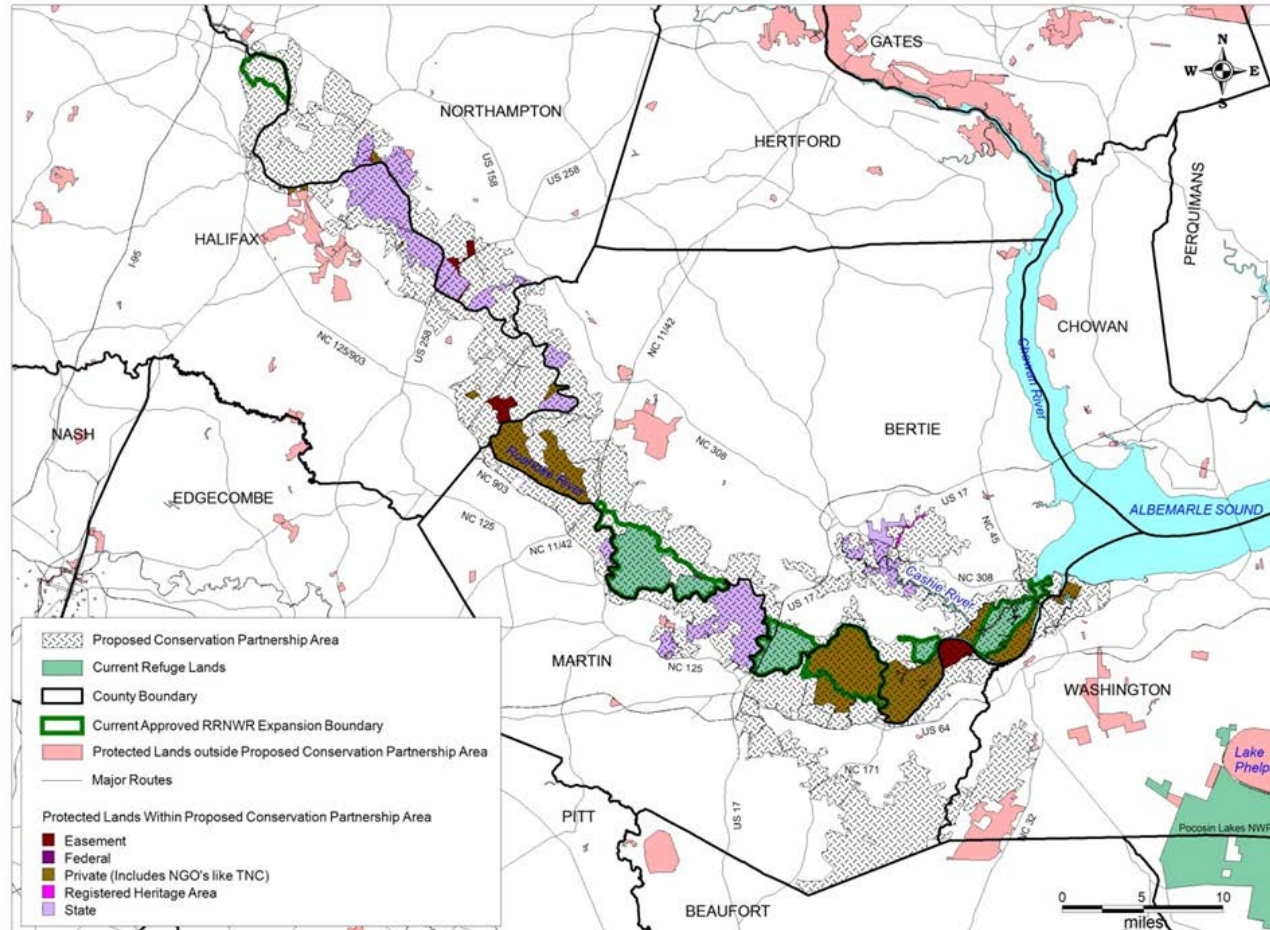


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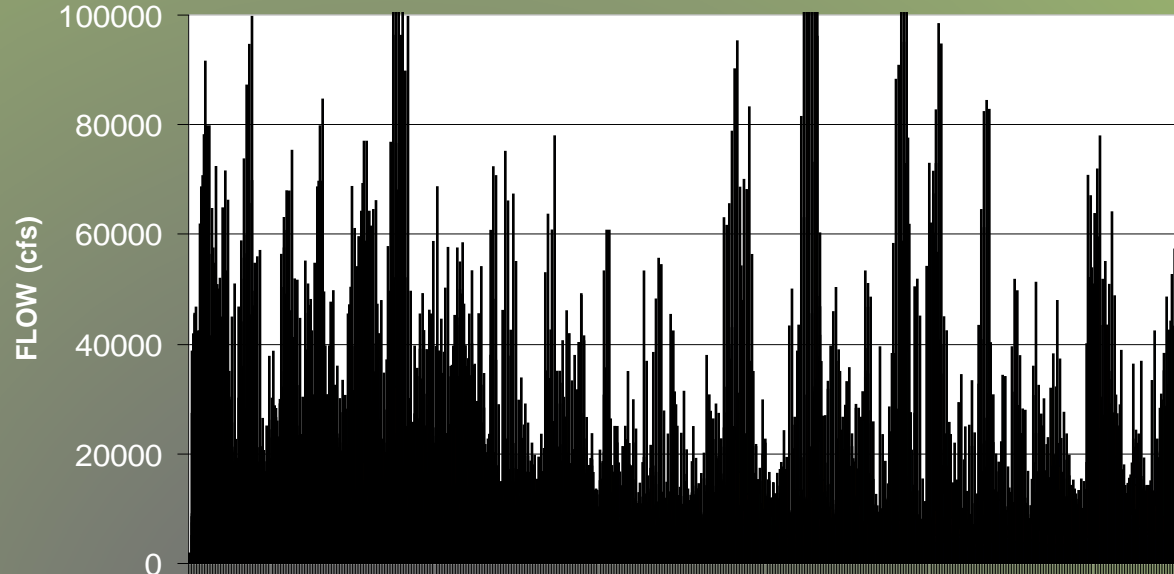
# Conservation Ownership



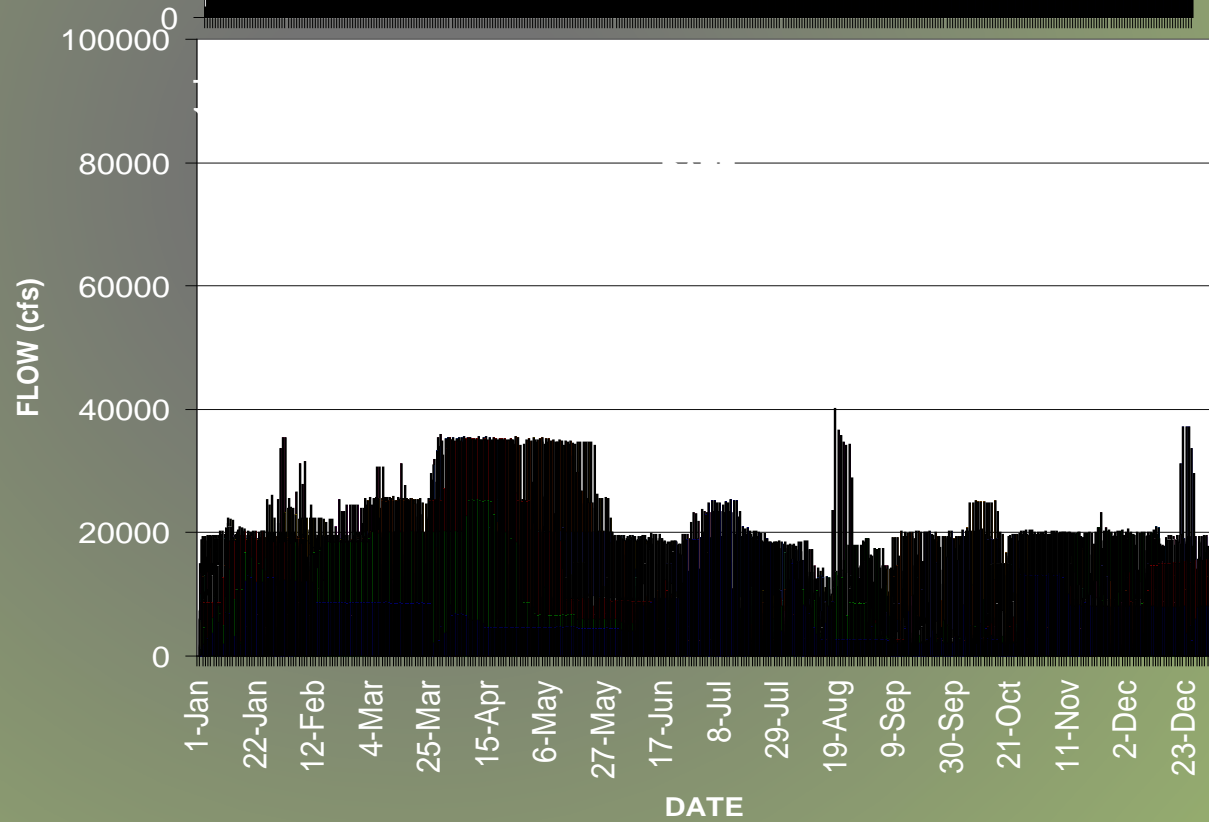
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**Unregulated  
River  
1912-1950**



**Regulated  
River  
1954-1999**





# Upstream Issues



- Low DO releases from Kerr Dam
- Impaired transportation due to flooded roads
- Lost recreational access



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# Downstream Issues and Impacts

- Diadromous fish habitat disruption
- Duration and timing of floodplain inundation (plants)
- Duration and timing of floodplain inundation (wildlife)
- Bank erosion
- Impaired recreation



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# Authorities in Place to Bring About Change



US Army Corps  
of Engineers®

- Federal Energy Regulatory Commission hydropower licensing (FERC 2009)
- U.S. Army Corps of Engineers, 216 Study
- One river, two parties
- A key challenge was to assign impacts to the responsible party, how to differentiate between their activities, and design effective mitigation.



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# Major Partners in the Collaborative Effort

- Dominion Generation
- Lower Roanoke River Landowner Alliance
- National Marine Fisheries Service
- North Carolina Division of Marine Fisheries
- NC Division of Water Quality
- North Carolina Division of Water Resources
- North Carolina Wildlife Federation
- North Carolina Wildlife Resources Commission
- Roanoke River Basin Association
- The Nature Conservancy
- U.S. Army Corps of Engineers
- U.S. Geological Survey
- Virginia Department of Game and Inland Fisheries
- Multiple universities provided research support throughout both processes



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# Developing the Science:

## Collecting the Evidence for Impacts

- Numerous studies were specified by the agencies and the stakeholders within both federal processes, including but not limited to:

- Diadromous fish studies
- Migratory bird studies
- Hydrological modeling: RRBROM, floodplain inundation; water quality models; DO by USGS
- Geomorphology work
- Seedling regeneration/survivorship



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# Addressing the Economic Dimension

- Aseasonal and prolonged flooding leading to:
  - Economics of the recreational impacts, both up- and downstream
  - Lost use days on both public and private lands downstream (hunting and fishing)
  - Agricultural and timber production losses



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# Addressing the Human Dimension Component of Change

- Building understanding and trust among the diverse stakeholders by:
  - Numerous stakeholder, congressional, power company and agency tours of the river and resources with high-ranking staff (USACOE Colonels)
  - Addressing stakeholder concerns
  - Agency heads
  - Regional Office staff
  - Agency staff
  - Private landowners
  - Non-governmental Organizations



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# Resolution Number One

- Studies through the FERC process were not conclusive. Partners developed an adaptive approach for how to move forward, including additional studies.
- Over the course of the next ten years, we continued to study and in the end reached agreement on mitigation of Dominion's share of the impacts.



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# Resolution Number Two

- The Corps' studies were more conclusive, but there was more organizational resistance on the Corps' part. With changes in the Corps leadership (new Colonels every three years), interest could vary and periodic re-education was crucial. Stakeholders constantly had to address Corps concerns and resolve them. A final key strategy was to develop a landowner alliance to address Corps and NC Dept. Ag. concerns about flooding of private lands. Another factor was the hiring of new Corps staff toward the end of the process who brought a fresh perspective.



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# Outcomes

- Appropriate operational changes were cooperatively developed which minimized ecological impacts, but provided for Dominion Power to continue to generate hydropower.
- The Corps of Engineers changed their operations to be more responsive to reservoir inflows, in order to shorten the duration of reservoir as well as downstream flooding, which should provide improved forest health.



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# Significant Achievement

- This process was one of, if not the first, to use an adaptive management approach in the issued license and settlement agreement to better address Dominion Power's impacts.
- This is the only Corps of Engineers hydropower dam in U.S. history that has modified operations for ecological reasons.



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# Where we go from here

Monitoring efforts will be a priority to ensure the QRR flow regime is meeting the expectations of stakeholders.



*The heart of this effort will be to:*

- continue to collect data from wells strategically located throughout the active floodplain.
- identify ways to improve the monitoring network in a way that supports correlations between floodplain hydrology and other indicators for the health of the ecosystem.



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# Lessons Learned and Advice

- Develop a consensus among the resource agencies through pre-meetings
- Sound legal advice to the agencies as needed
- Building personal relationships and developing trust
- Getting stakeholders out on the river and showing them the resources and impacts
- Never, never, ever give up: the process is likely going to take a LONG time, but the results are worth it, especially since the management measures will be in place for decades
- Stability of staff and organizational representation over the long run was an important factor (e.g., the USFWS team from three different divisions remained the same for decades)
- Retirees from agencies, and industry, were significant contributors to the process
- Address impediments as they arise, and outmaneuver opponents.



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# Additional Information on Settlement

USACE Revised Water Control Plan:

<http://epec.saw.usace.army.mil/KERRWCP.pdf>

Dominion Power Settlement :

Go to: [https://elibrary.ferc.gov/idmws/docket\\_search.asp](https://elibrary.ferc.gov/idmws/docket_search.asp)

For Part 1. Do a docket search for P-2009 with a date of 24 Nov 2015. Click on **File List** link beneath the text:

Submission of signed Article 414/415 Within Day and Within Week Peaking Operations Settlement Agreement of Dominion North Carolina Power under P-2009.

For Part 2 do a docket search for P-2009 with a date range of 28 March 2013. Click on **File List** link beneath the text:

Dominion North Carolina Power Article 414 Within Day Peaking Effects and Article 415 Within Week Peaking Effects, Determination Report Part 1 for the Roanoke Rapids and Gaston under P-2009.



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