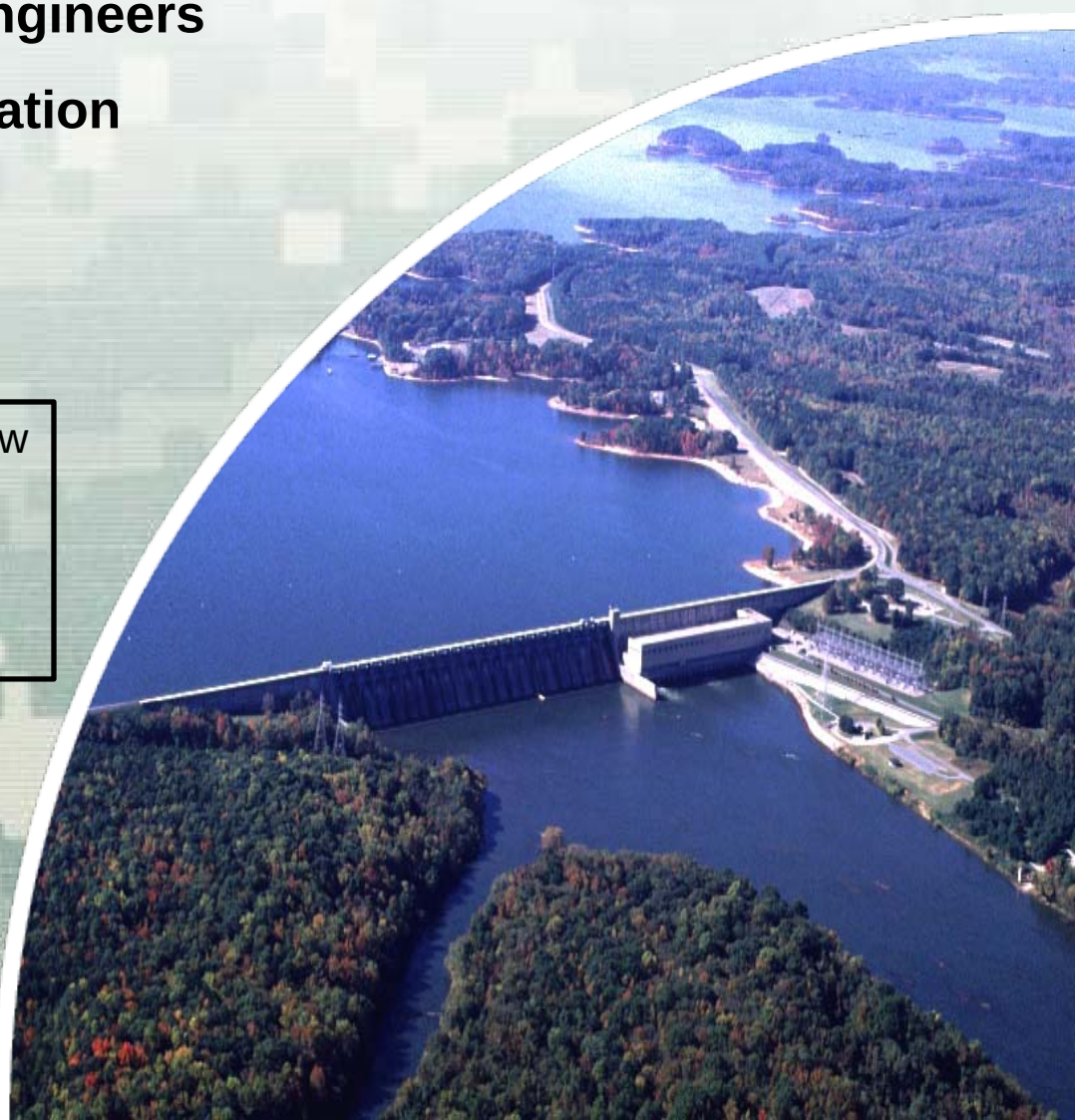
John H. Kerr Dam and Reservoir
Virginia and North Carolina (Section 216)

Wilmington District, Corps of Engineers

Stakeholder Update Presentation

January 24, 2014



- Authorized under Section 216 of Public Law 91-611, the River and Harbor and Flood Control Act of 1970, as amended.
- Non-federal Sponsors are the State of NC and Commonwealth of VA

US Army Corps of Engineers
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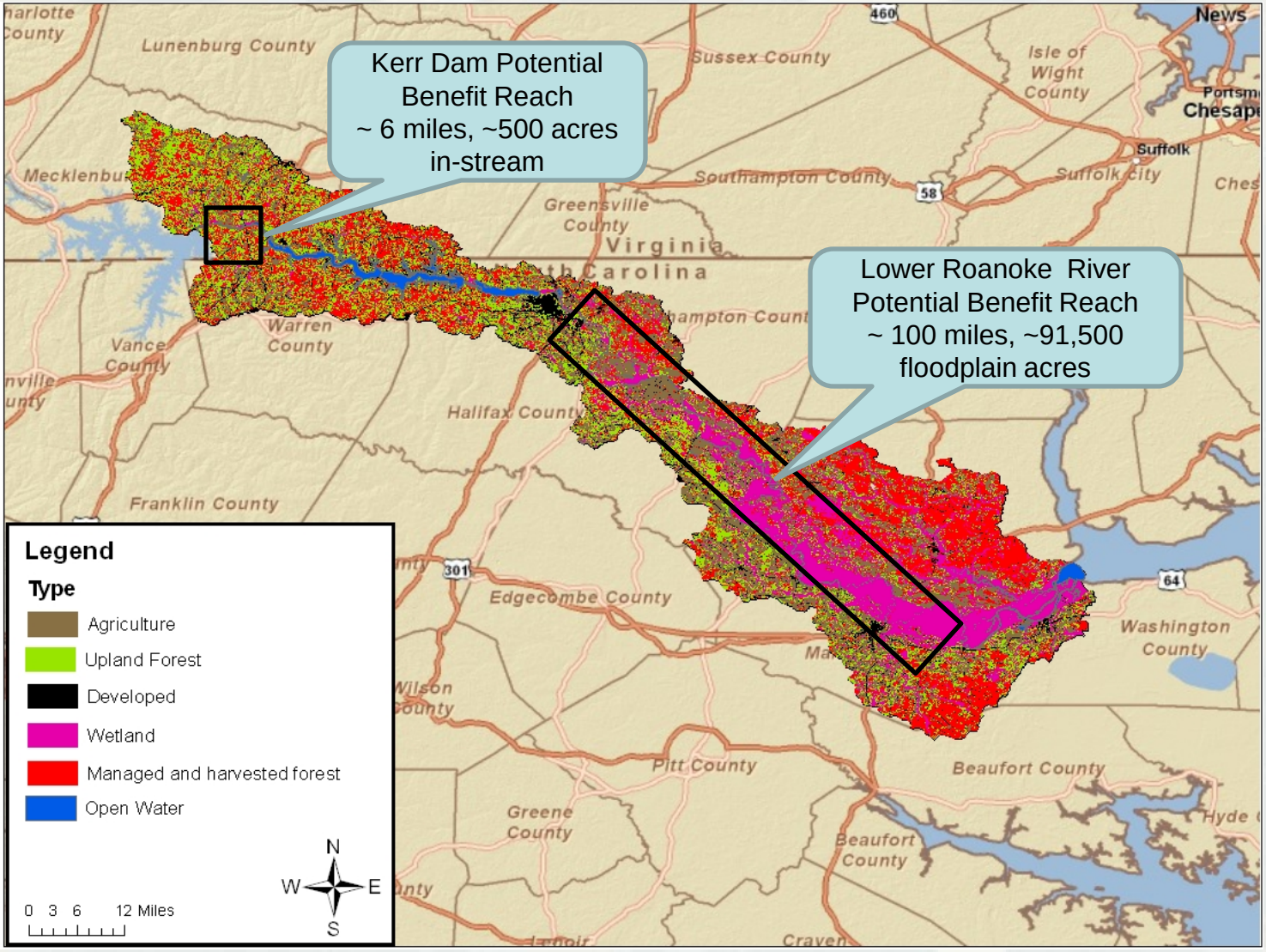
Lower Roanoke River Basin
Land Use and Benefit Reaches



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Measures Initially Analyzed

13 measures initially considered – screened down to 5 for detailed analysis.

Improve Lower Roanoke River Ecosystem. Evaluated Entire Ecosystem (35,000 CFS Footprint) by Environmental Benefits Analysis Model

1. Modify reservoir guide curve (MGC_35K) and more frequent release of 35,000 cfs from January - June. (Note: MGC_35K was formerly known as 6B)
2. MGC_35K Year Round
3. Quasi Run-of-River (QRR): When Kerr Reservoir water level is above guide curve, weekly outflow ≈ weekly inflow up to 35,000 cfs

Improve DO Downstream of Kerr Dam. (Project in VA, but VA Has Withdrawn from the Study.)

4. Inject oxygen into the hypolimnion upstream of the dam
5. Place a fabric weir upstream of the dam

Summary of Costs and Benefits for the Initial Array of Measures Being Evaluated

Benefits/Costs/Impacts		Fabric Weir	Reservoir O^2 Injection	MGC_35K	MGC_35K yr_rnd	QRR
Environmental Benefits (AAHU)		254	254	-288	-170	1,976
Acres affected		501	501	91,491	91,491	91,491
Recreation Reservoir vs. Existing		no change	no change	nearer guide curve	nearer guide curve	nearer guide curve
Flood Storage vs. Existing		no change	no change	better	better	better
Construction and O&M Cost						
	Initial Construction Costs Only	~ $10 million	> $10 million	$0	$0	$0
	O&M	Low	High	$0	$0	$0
Losses						
	Hydropower (AA$)	$0	$0	~ $2.3 million (2.0%)	~$2.9 million (2.5%)	~$3.8 million (3.3%)
	Agriculture Impact (AA$)*	$0	$0	~$50,000	~$200,000	~$250,000

* about 1,600 acres and 63 landowers

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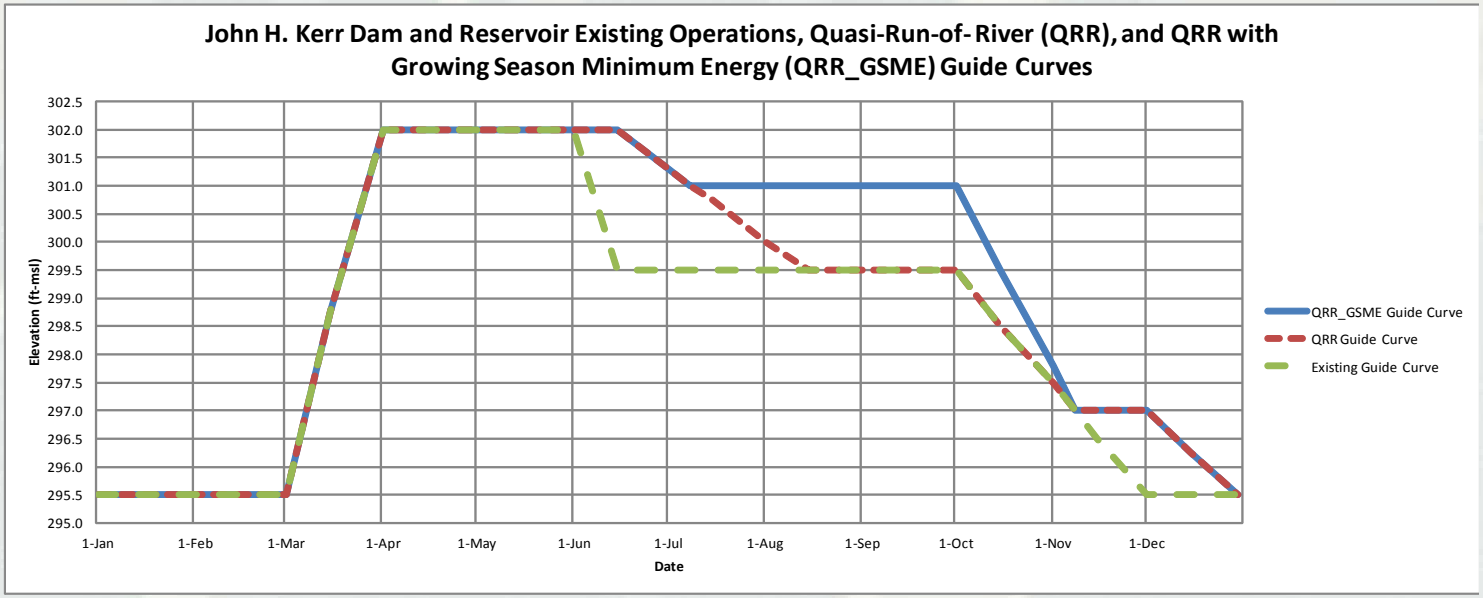
Why New Alternative?

- QRR only alternative with ecological benefit
  - However neither the State of North Carolina nor the Corps has the authority to acquire impacted agricultural land;
  - Therefore State of North Carolina does not support QRR unless agricultural impacts resolved.

- Develop a new alternative with wetter winter & springs and drier summers compared to existing conditions. Also have minimal impacts to agricultural land during growing season.

- New alternative : QRR_Growing Season Minimum Energy

QRR _Growing Season Minimum Energy



Existing Operations*		QRR Year-Round*	QRR with Growing Season Minimum Energy (QRR_GSME)*
Kerr Lake Level (ft-msl)	Roanoke Rapids Releases (cfs), year-round	Roanoke Rapids Releases (cfs), year-round	Roanoke Rapids Releases (cfs)
Below 300	Up to 8,000	**Above Guide QRR Curve (GC)**: Outflow ~=Inflow up to 35,000 cfs based on a weekly average inflow. **Below GC:** Minimum energy (equal or exceeds FERC minimum releases at Roanoke Rapids Dam). Above 320: Existing Operations.	**December 1 through March 31**: **Above QRR_GSME Guide Curve (GC):** Outflow ~=Inflow up to 35,000 cfs based on a weekly average inflow. **Below GC:** Minimum energy (equal or exceeds FERC minimum releases at Roanoke Rapids Dam). Above 320: Existing Operations.
300-312	Up to 20,000		
312-315	Up to 25,000		
315-320	Up to 35,000		
320-321	85% of inflow or up to 35,000, whichever is higher		**QRR_GSME GC April 1 through November 30:**
			Below guide curve: Minimum Energy
			Guide curve to 301.5: Up to 8,000 cfs
Above 321	Inflow		301.5-312: Up to 20,000 cfs
			Above 312: Existing Operations
*April 1-June 15, abide by fishery releases, if feasible			

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Summary of Costs and Benefits for the Initial Array of Measures Being Evaluated

Benefits/Costs/Impacts		Fabric Weir	Reservoir O^2 Injection	MGC_35K	MGC_35K yr_rnd	QRR_GSME	QRR
Environmental Benefits (AAHU)		254	254	-288	-170	-572**	1,976
Acres affected		501	501	91,491	91,491	91,491	91,491
Recreation Reservoir vs. Existing		no change	no change	nearer guide curve	nearer guide curve	nearer guide curve	nearer guide curve
Flood Storage vs. Existing		no change	no change	better	better	less during summer	better
Construction and O&M Cost							
	Initial Construction Costs Only	~ $10 million	> $10 million	$0	$0	$0	$0
	O&M	Low	High	$0	$0	$0	$0
Losses							
	Hydropower (AA$)	$0	$0	~ $2.3 million (2.0%)	~$2.9 million (2.5%)	~$3.5 million (3.0%)	~$3.8 million (3.3%)
	Agriculture Impact (AA$)*	$0	$0	~$50,000	~$200,000	Similar to Existing	~$250,000

* about 1,600 acres and 63 landowners.

** Greater impacts because area between 20 and 35k cfs discharge flooded less frequently than under existing operations

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Final Measures and Alternatives

- MGC_35k, MGC_35k_yr_rnd and QRR_GSME not viable due to decrease in habitat units.

- QRR is a viable alternative since it has ecological benefits.
  - However neither the State of North Carolina nor the Corps has the authority to acquire impacted agricultural land;
  - Therefore State of North Carolina does not support QRR unless agricultural impacts resolved.

Path Forward Discussion