

A. rostrata, rostrata. Where for Art Thou, rostrata?

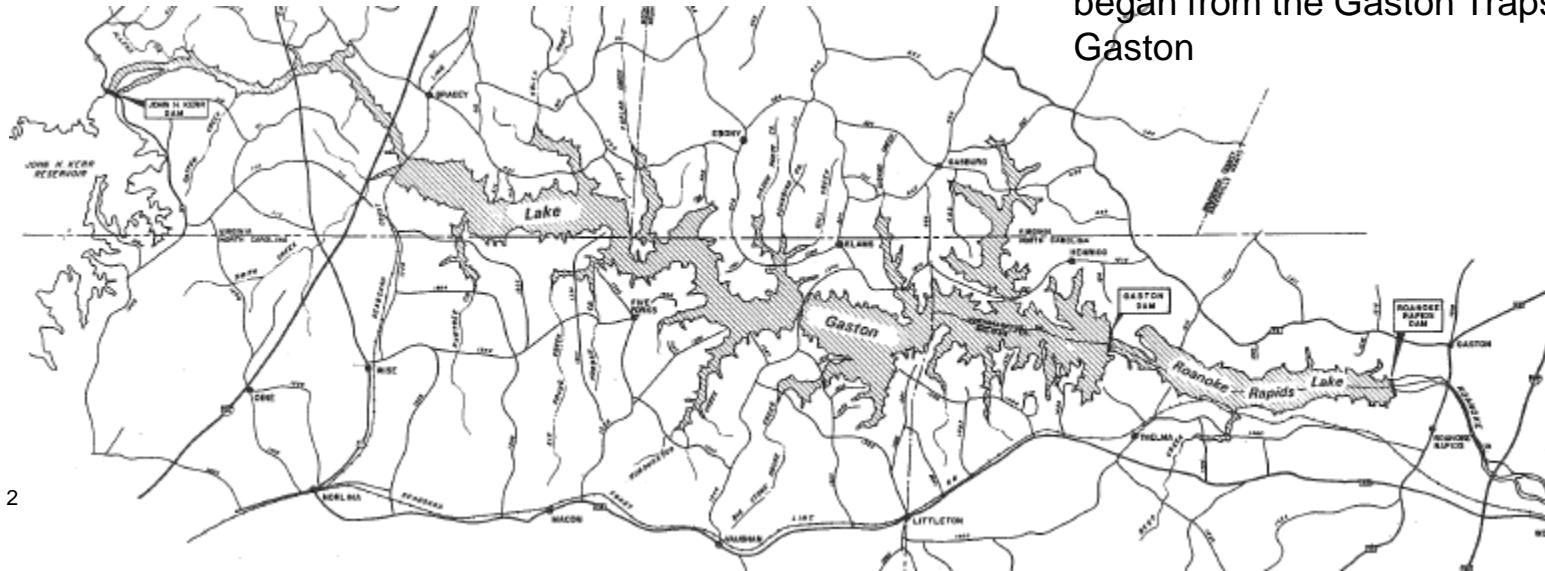
Aristotle's Mud to Modern Day

Pete Sturke, Bob Graham, and Corey Chamberlain

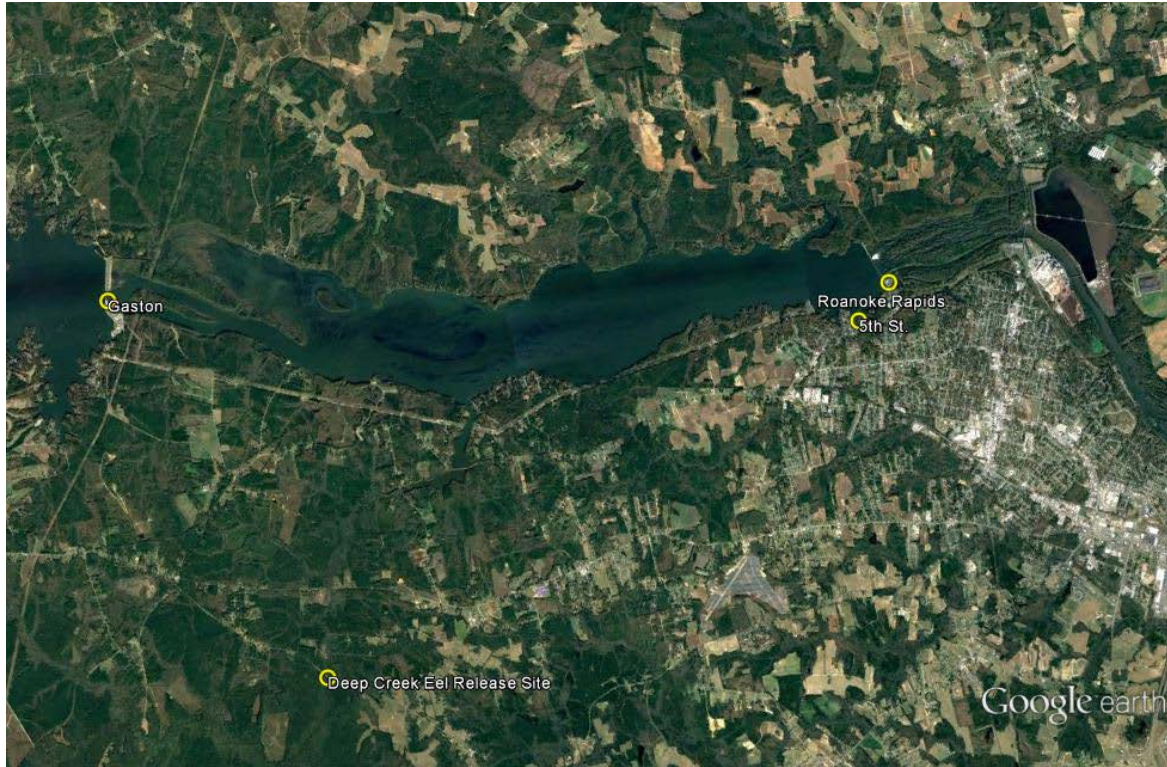
Eel Passage

Operations and Performance 2010-18

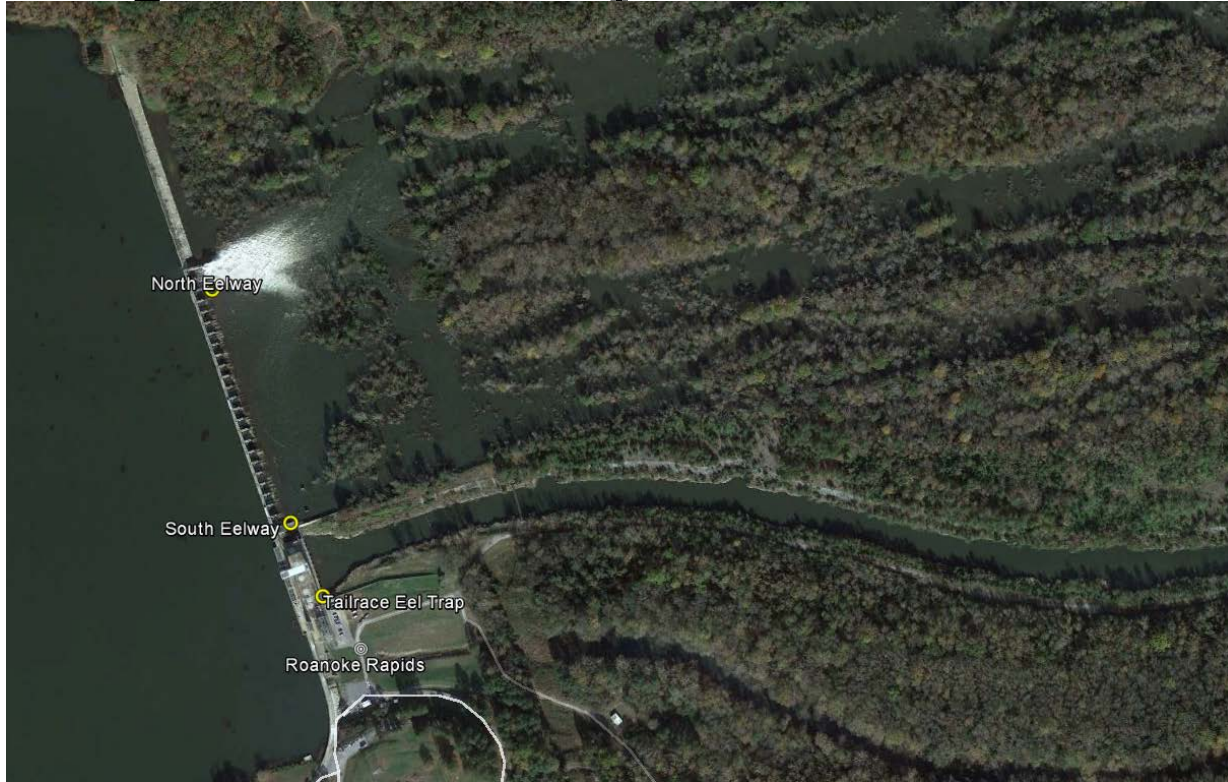
- Operate from March 1 to November 30
- Trap and Transport at Roanoke Rapids
 - 50% Eels to Deep Creek (Main Tributary)
 - 50% to 5th Street (Head Pond)
- Trap operations at Gaston
 - Remainder re-stocked into Roanoke Rapids Lake until July 2018
 - July 2018 – Tagging with CWT and passage began from the Gaston Traps into Lake Gaston



Eel Passage – Roanoke Rapids and Gaston



Eel Passage – Roanoke Rapids



Eel Passage

Roanoke Rapids Eelways



North Eelway
30M long, 43 degree ramp angle with two turn pools
250L holding tank → 350L spring 2018



South Eelway
8M long, 41 degree ramp angle
265 L holding tank with flow through



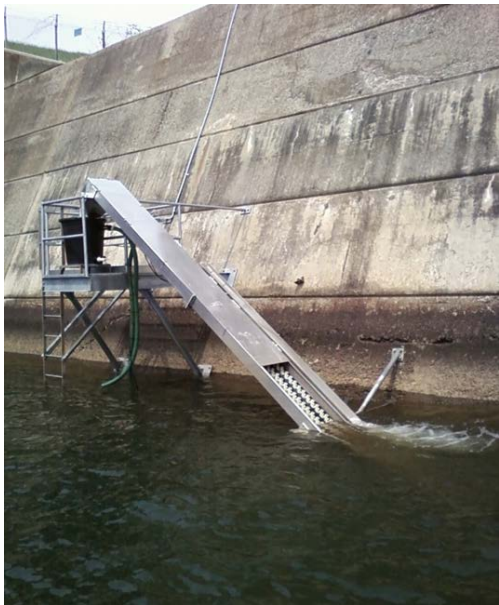
Turn pool and Milieu Elver substrate

Eel Passage - Gaston



Eel Passage

Gaston Eel Traps



North Eel Trap
11M long and sits at a 45 degree angle
151L holding tank with flow through



South Eel Trap
12.8M long and sits at a 38 degree angle
151L holding tank with flow through



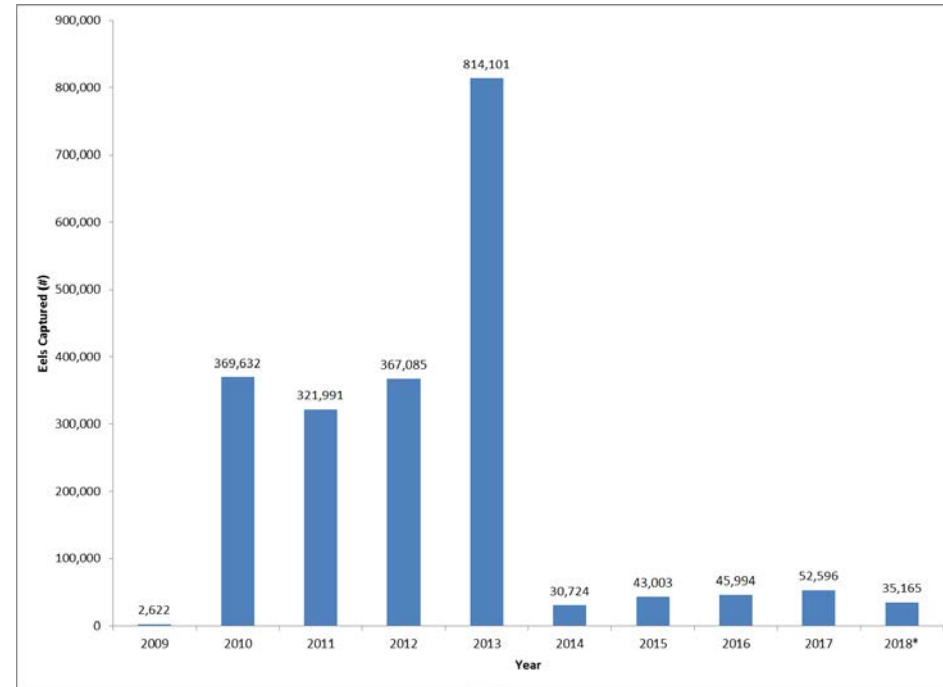
Eelway and Eel Trap substrates

Eel Passage

Roanoke Rapids Eel Passage to Date

Year	Collection Location				Total	Number Passed Upstream
	Bypass	Tailrace	N. Eelway	S. Eelway		
2005	35,686	NA	NA	NA	35,686	0
2006	26,136	3	NA	NA	26,139	0
2007	20,412	NA	NA	NA	20,412	0
2008	17,206	3	NA	NA	17,209	0
2009	11,021	661	NA	NA	11,682	2,622
2010	2,941	448	37,716	361,524	402,629	369,632
2011	NA	484	3,025	318,600	322,109	321,991
2012	NA	155	76,033	290,898	367,086	367,085
2013	NA	392	68,181	750,698	819,271	814,101
2014	NA	144	11,590	23,482	35,216	30,724
2015	NA	237	36,887	6,105	43,229	43,003
2016	NA	631	44,368	5,810	50,809	45,994
2017	NA	258	9,856	42,700	52,814	52,596
2018*	NA	148	3,542	31,475	35,165	35,165
Total	113,402	3,564	291,198	1,831,292	2,239,456	2,082,913

*as of 10 August 2018

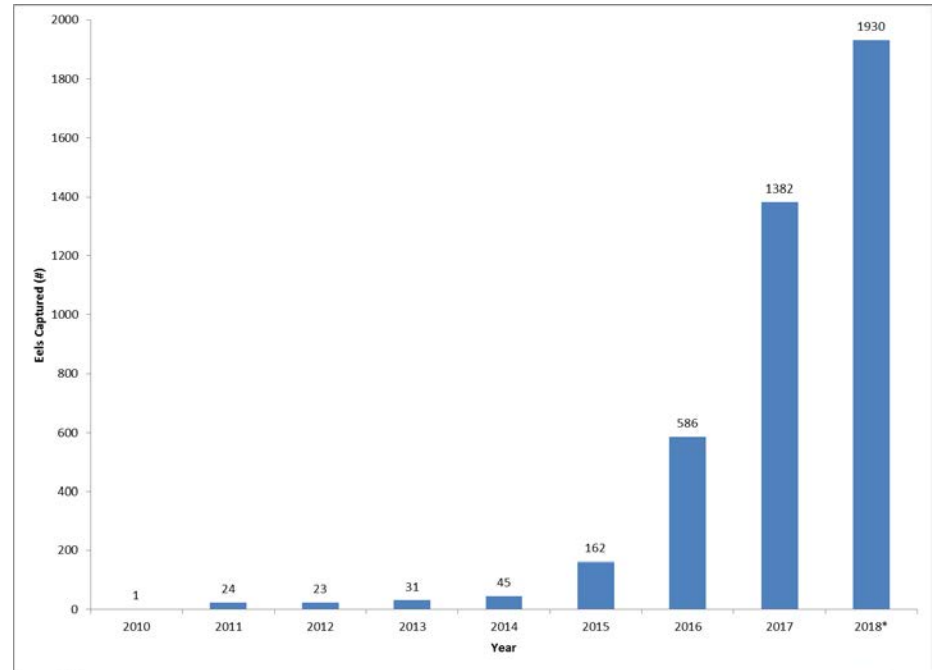


Eel Passage

Gaston Eel Catch to Date

Year	North Gaston	South Gaston	Annual total	Passed into Lake Gaston
2010	0	1	1	0
2011	0	24	24	0
2012	3	20	23	0
2013	2	29	31	0
2014	6	39	45	0
2015	2	160	162	0
2016	14	572	586	0
2017	138	1244	1382	0
2018*	429	1501	1930	240
Total	594	3590	4184	240

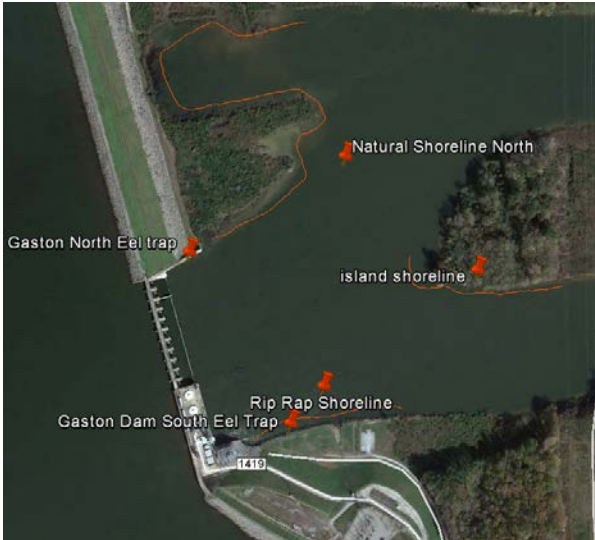
*as of 10 August 2018



Previous Studies

Where do the Eels go?

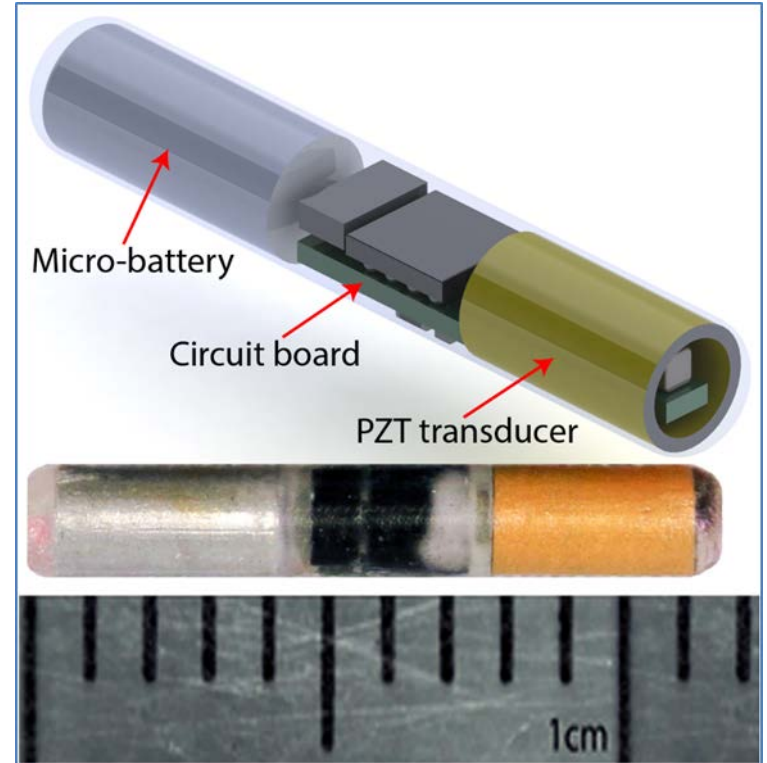
- Monitoring after passage into Roanoke Rapids Lake
 - Deep Creek (Lentic and Lotic) 2011-18
 - 9749 Eels tagged with Coded Wire Tags
 - Electrofishing and Gaston Eel Trap Recapture rate < 0.1%
 - First Silver Eel collected in November 2016
 - Toe of Gaston Dam (Traps and Electrofishing) 2012-18
 - Night Electrofishing catch rates comparable to North and South Eel catch rates



Recent Tracking Study

Pacific Northwest National Lab (PNNL)

- Tagged 116 Juvenile American Eel with acoustic micro-transmitters
 - 130-250mm TL
 - Detected 106 (92% detection)



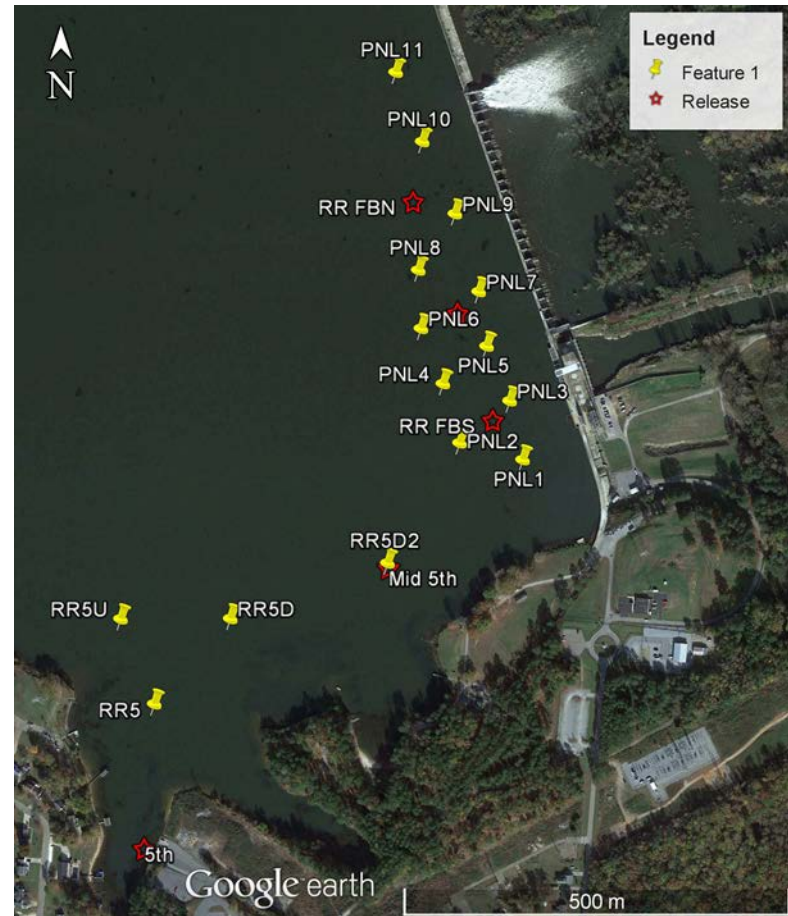
Recent Tracking Study

PNNL Study 1

- Fine scale Dam Interaction (3-Dimensional)
- 9 Juvenile Salmon Acoustic Telemetry System (JSAT) receivers were set up in a 3-dimensional array in the forebay
- 30 Eels released within Forebay (North, Mid, & South)

PNNL Study 2

- Eel Dispersion Tracking
- 13 JSAT receivers were set up in Roanoke Rapids Lake and Deep Creek



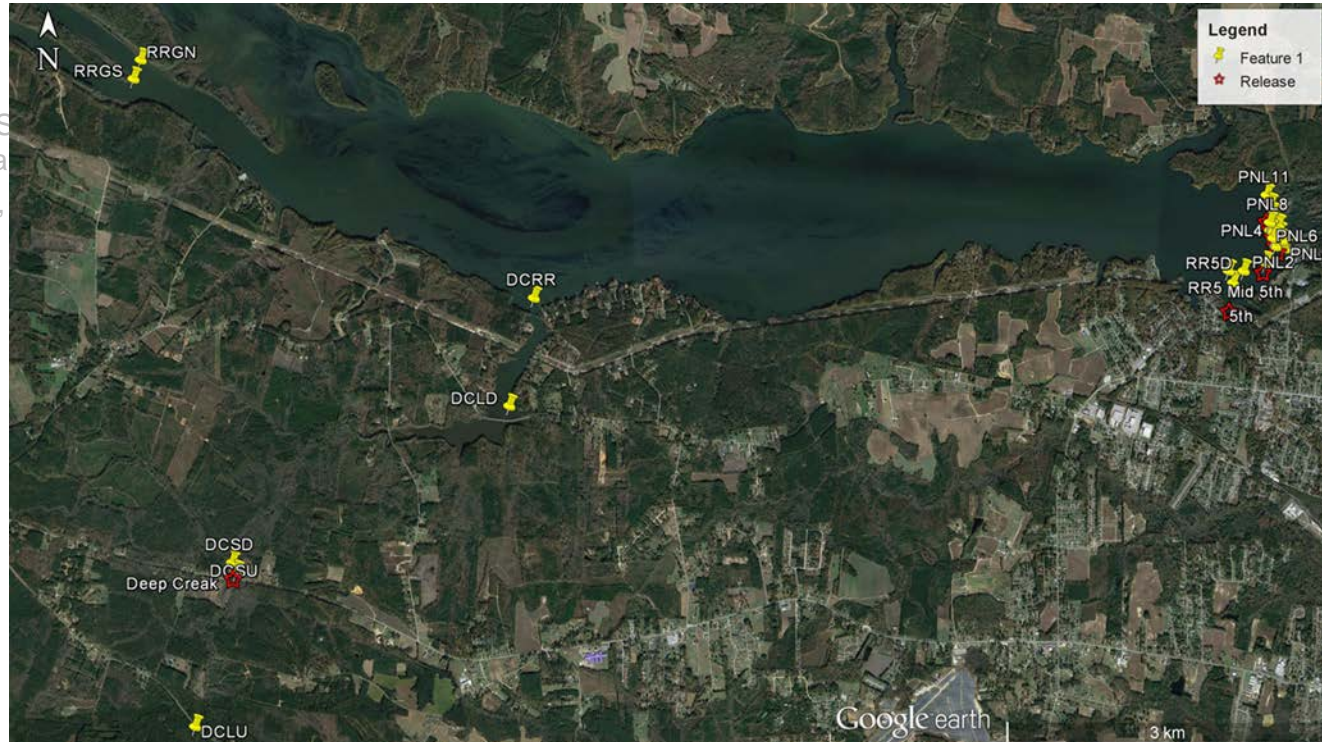
Recent Tracking Study

PNNL Study 1

- Fine scale Dam Interaction
- 9 Juvenile Salmon Acoustic Telemetry System receivers were set up in a 3-dimensional
- 30 Eels released within Forebay (North,

PNNL Study 2

- Eel Dispersion Tracking
- 13 additional JSAT receivers were set up in Roanoke Rapids Lake and Deep Creek
- 76 Eels released from 2 separate tagging and stocking events
 - 50% to Deep Creek
 - 50% to 5th street



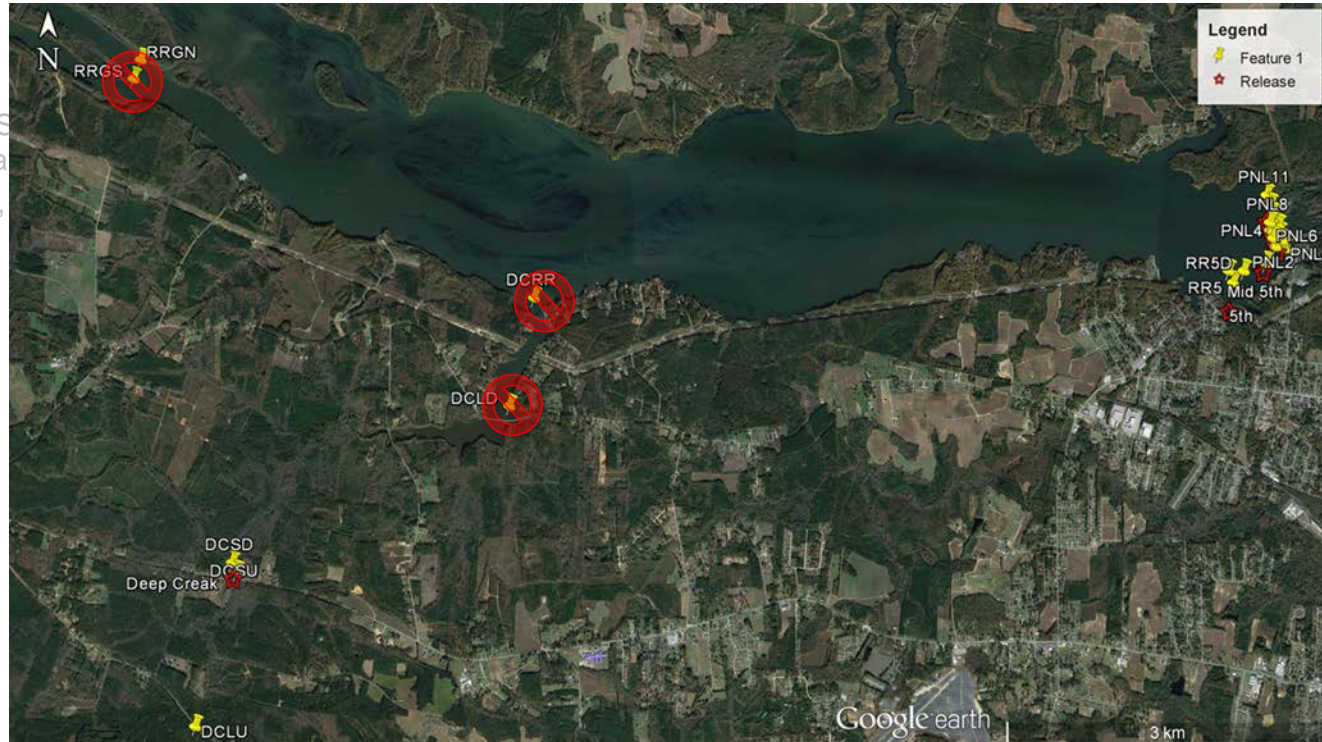
Recent Tracking Study

PNNL Study 1

- Fine scale Dam Interaction
- 9 Juvenile Salmon Acoustic Telemetry System receivers were set up in a 3-dimensional
- 30 Eels released within Forebay (North,

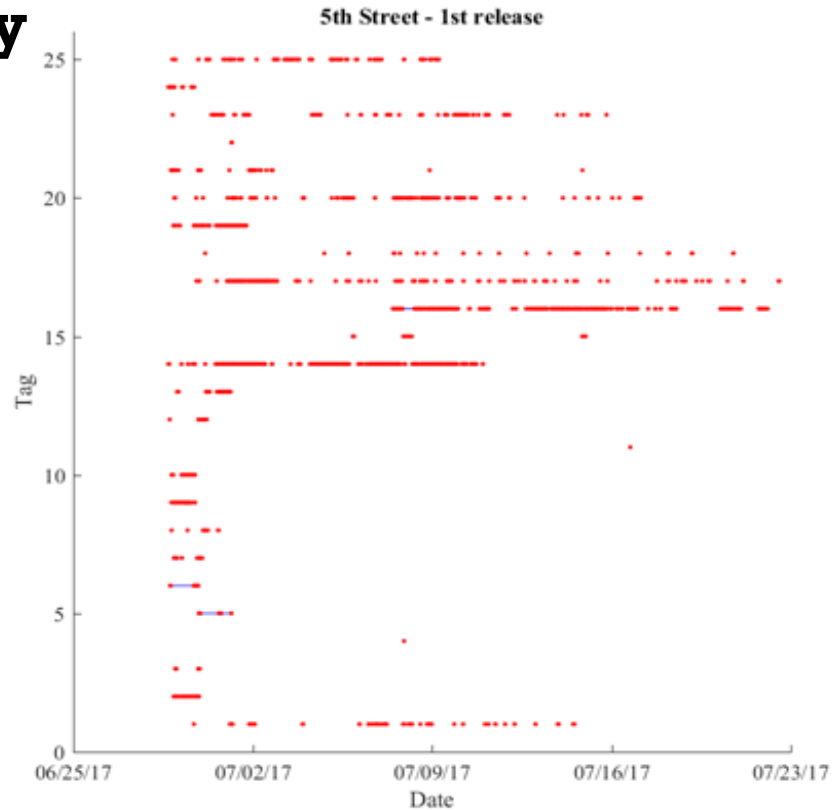
PNNL Study 2

- Eel Dispersion Tracking
- 13 additional JSAT receivers were set up in Roanoke Rapids Lake and Deep Creek
- 76 Eels released from 2 separate tagging and stocking events
 - 50% to Deep Creek
 - 50% to 5th street



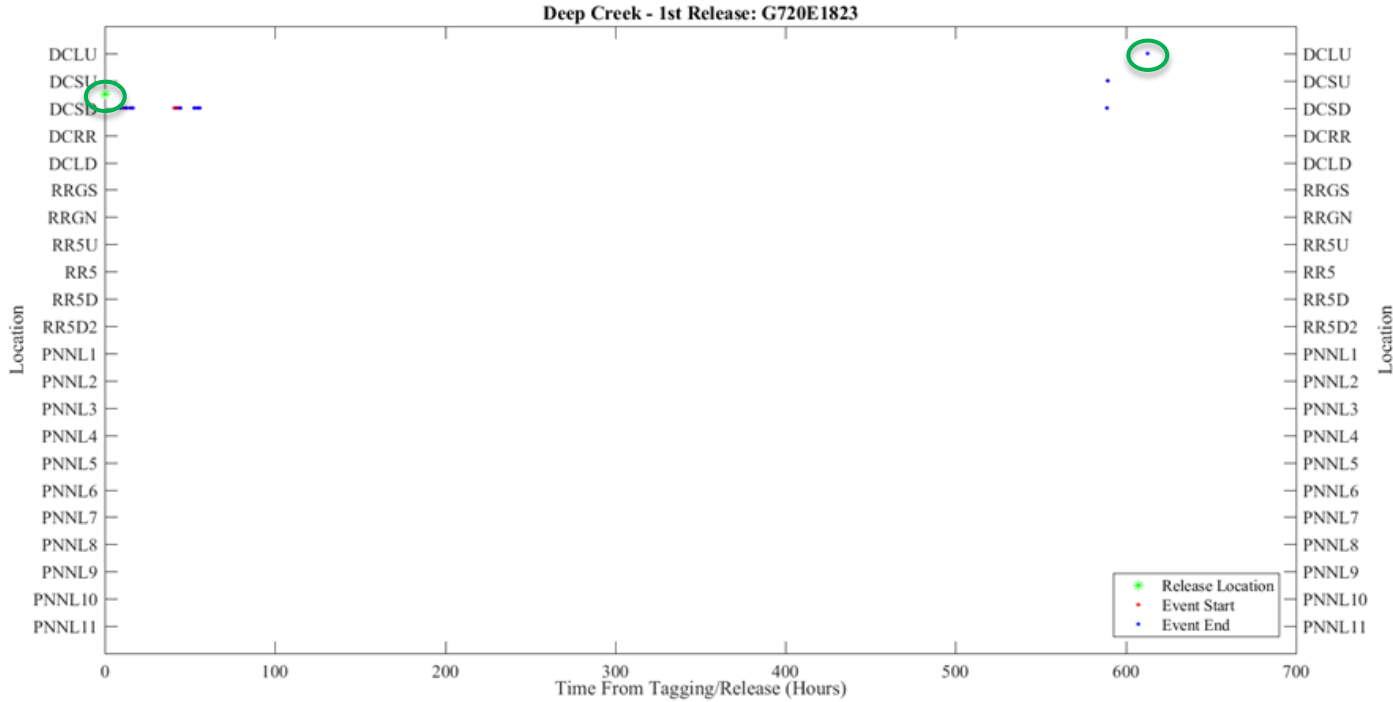
Recent Tracking Study

Individual receiver location (5th street)



Recent Tracking Study

- Individual tagged Eel released in Deep Creek



Summary Results

- Roanoke Rapids Eelways have safely passed over 2 million American Eels into Roanoke Rapids Lake since 2009
- Gaston Eel Traps are showing exponential increase in eel catches
 - 240 Eels have been tagged and transported into Lake Gaston (as of 10 August 2018)
- Eels transported to Roanoke Rapids Lake seem to be exhibiting natural upstream migratory behavior after release
- PNNL acoustic micro-transmitters provide effective means for non-lethal tracking of American Eels in hydropower applications

Thank you!

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

Contact

Pete Sturke

Peter.M.Sturke@dominionenergy.com

