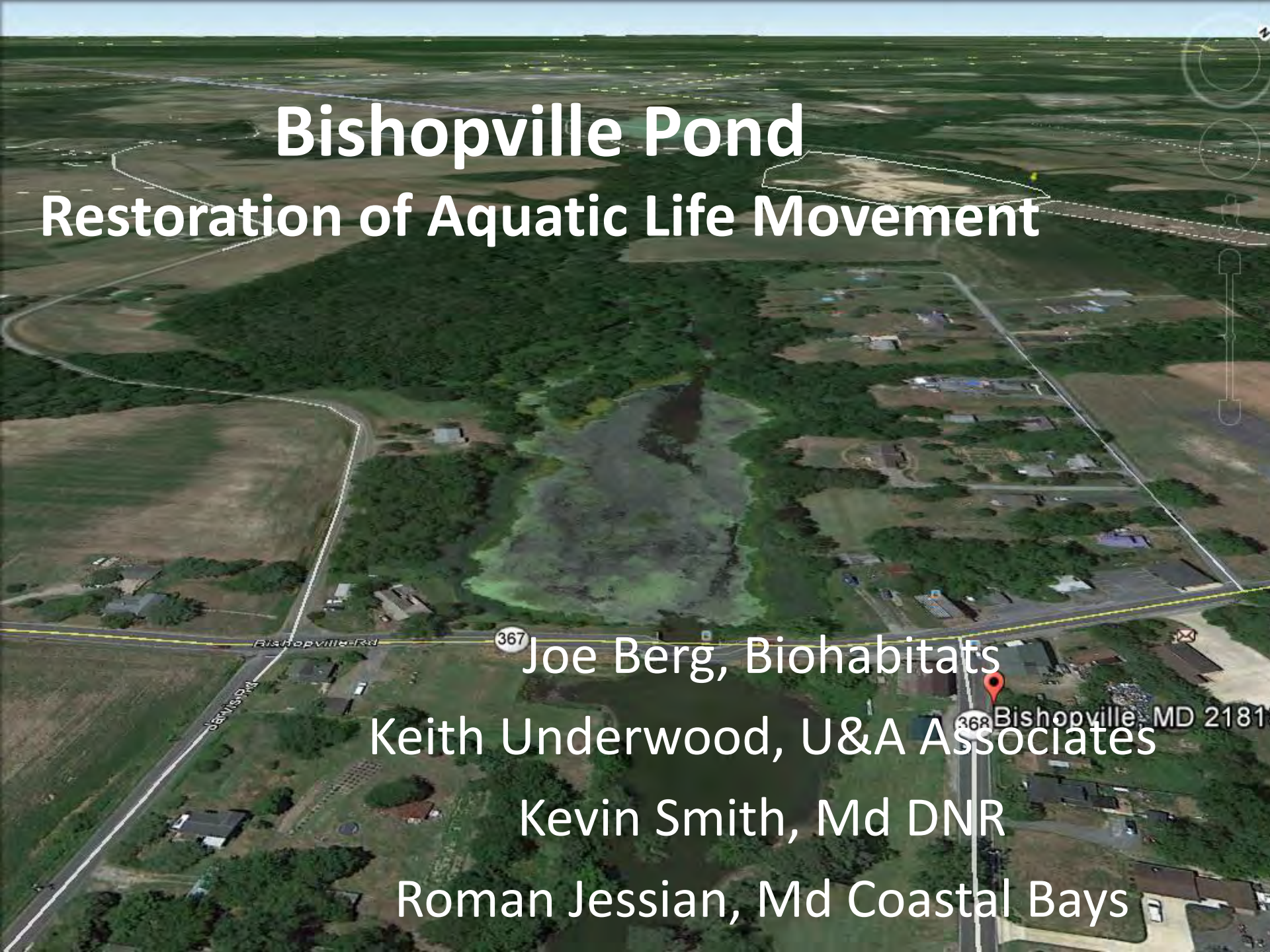
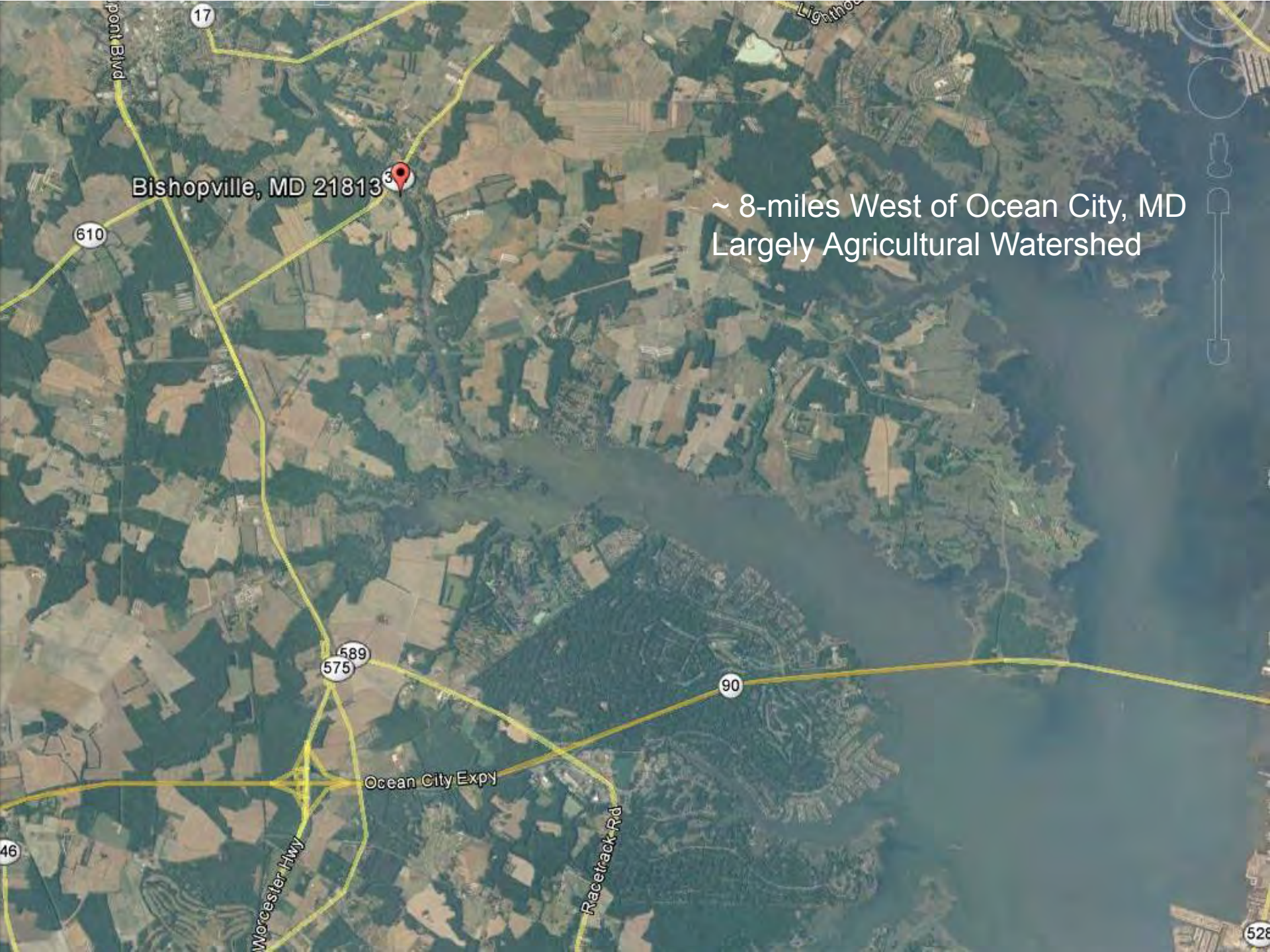
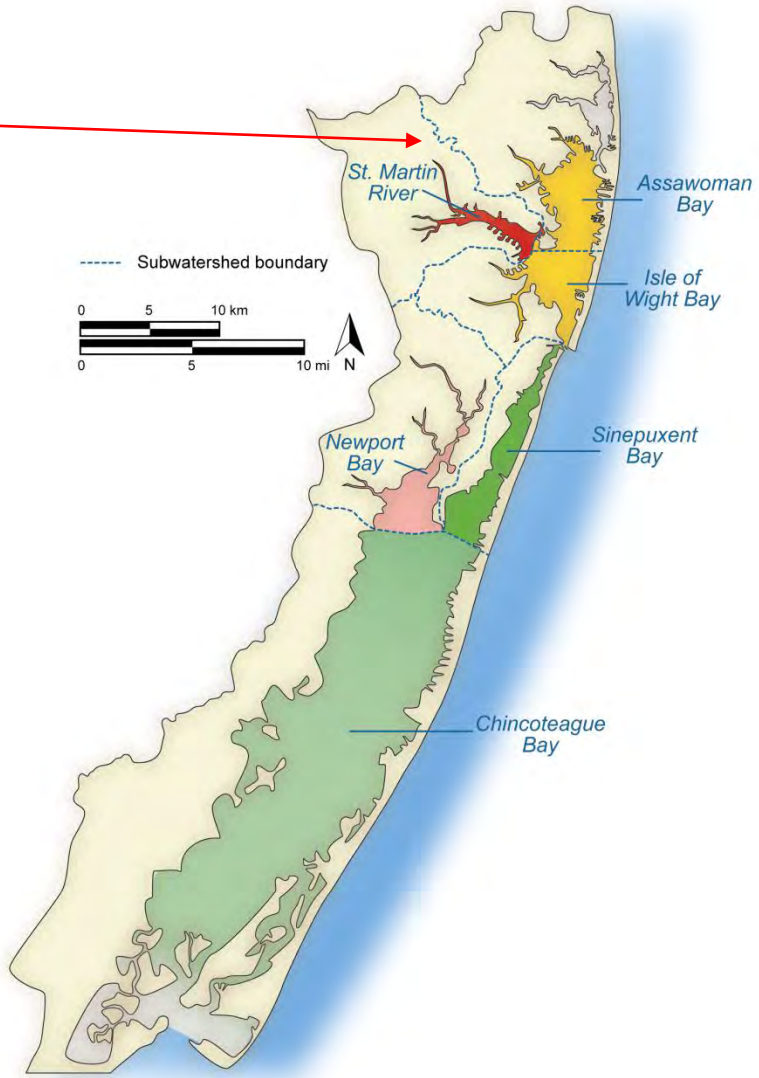

Bishopville Pond
Restoration of Aquatic Life Movement
Joe Berg, Biohabitats
Keith Underwood, U&A Associates
Kevin Smith, Md DNR
Roman Jessian, Md Coastal Bays
Bishopville Rd
367
368
Bishopville, MD 2181


Bishopville, MD 21813
~ 8-miles West of Ocean City, MD
Largely Agricultural Watershed
17
610
589
575
90
Ocean City Expy
Racetrack Rd
Worcester Hwy
46
528


Rt 367


Coastal Lagoon
St Martins River


St. Martin River
Assawoman Bay
Isle of Wight Bay
Subwatershed boundary
0 5 10 km
0 5 10 mi
N
Newport Bay
Sinepuxent Bay
Chincoteague Bay

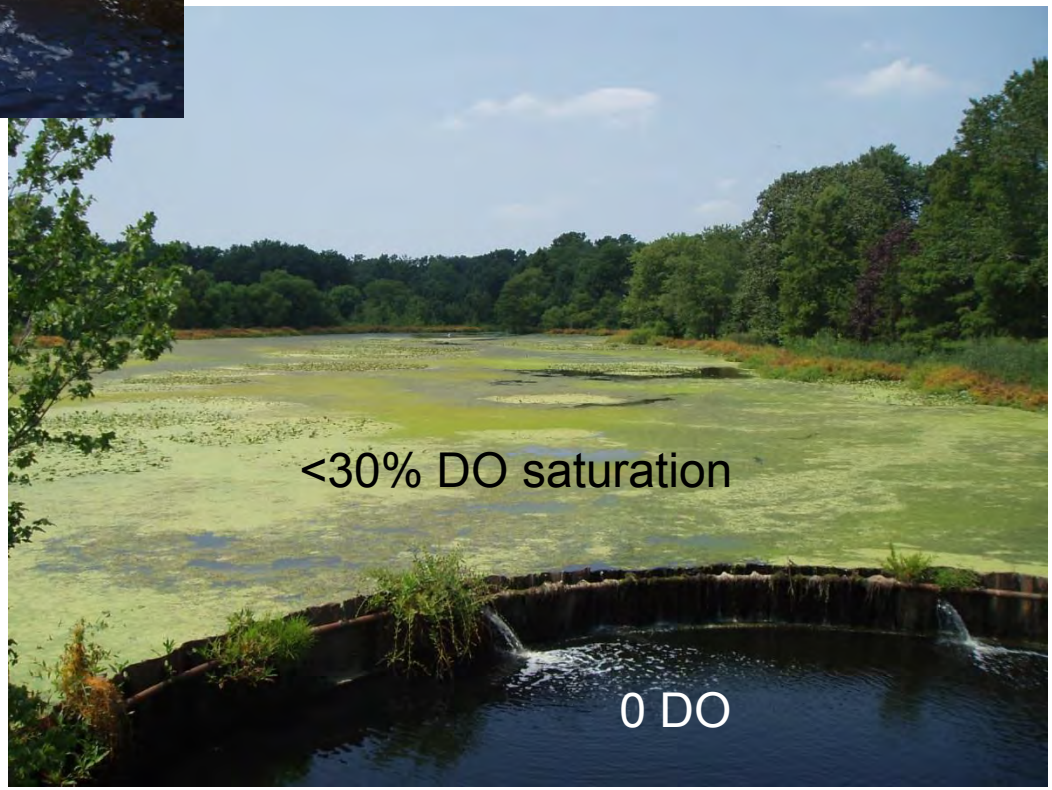
Project Site Background

- Chicken processing plant discharged into Buntings Branch, including dumping of slaughter byproducts
- More recently (ongoing), excess chicken waste applied to fields as fertilizer (13 mi^2 drainage area)
- Shallow pond with organic-rich fine 'black mayo' substrate re-suspended and 'flushed' downstream periodically with large summer thunderstorms
- Anoxic discharge contributed to fish kills

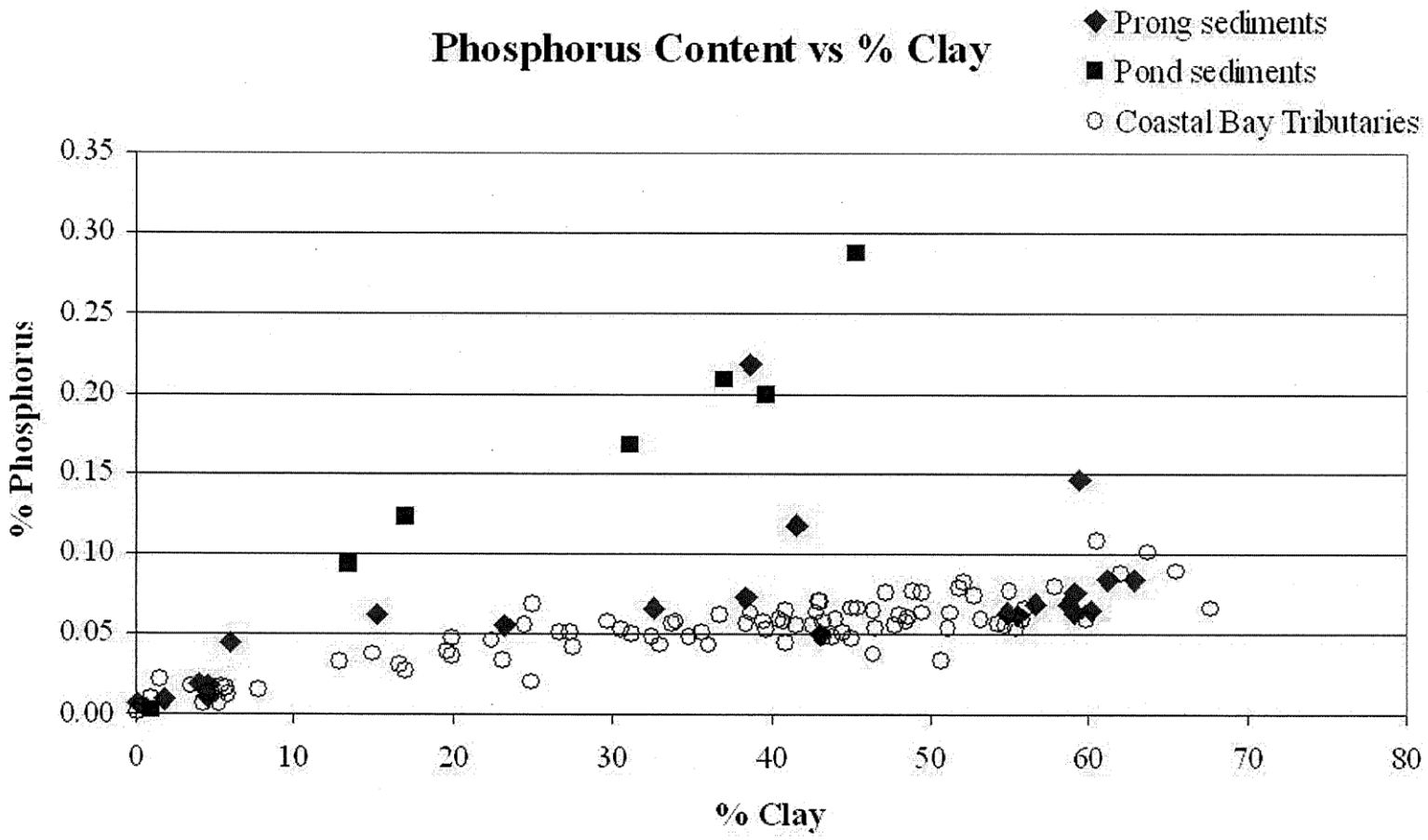
Bishopville Pond

Fish Passage

Water Quality issues, i.e.,
Dissolved Oxygen
Problems in Summer



MARYLAND DEPARTMENT OF NATURAL RESOURCES
Bishopville Prong Study



Bathymetric and Sediment Assessment in the Bishopville Prong of St. Martin River

Darlene V. Wells, Richard A. Ortt, Jr., and Stephen Van Ryswick
Funded by MCBP 2011-2012 Implementation Grant

- C, N and P contents in Pond were some of the highest observed in the coastal bays watershed.
- Based on mass ratio C to N, a significant portion of the total C and N in the Pond and upstream area of the Prong may be attributed to algae blooms, and the Pond is a significant source of C and N to the Prong.
- Bishopville sediment contain the highest sulfur levels observed in the coastal bays watershed.
- Historic spills from Processing Plant thought to be a significant source of the S.
- Less than 30% DO Saturation during summer months


Bank St
Bishopville Rd
Bishopville, MD 21813
Hotel Rd
368

Resource Balance

- Important to restore aquatic life passage to 7-miles of stream length above mill pond
- Critical to understand and appreciate the values and history of the pond to the local community – they live here!
- Will lead to a greater number of restoration and educational/stewardship opportunities
- Dam removal does not have to be an ‘either or’ decision

No known fishery for anadromous fishes,
but river herring have been documented in the lower river

Alewife

White perch

American Eel

Menhaden

White Mullet

Spot

Bluefish

Striped bass

Mummichog

Eel Life History

Elvers attempting to climb dam wall

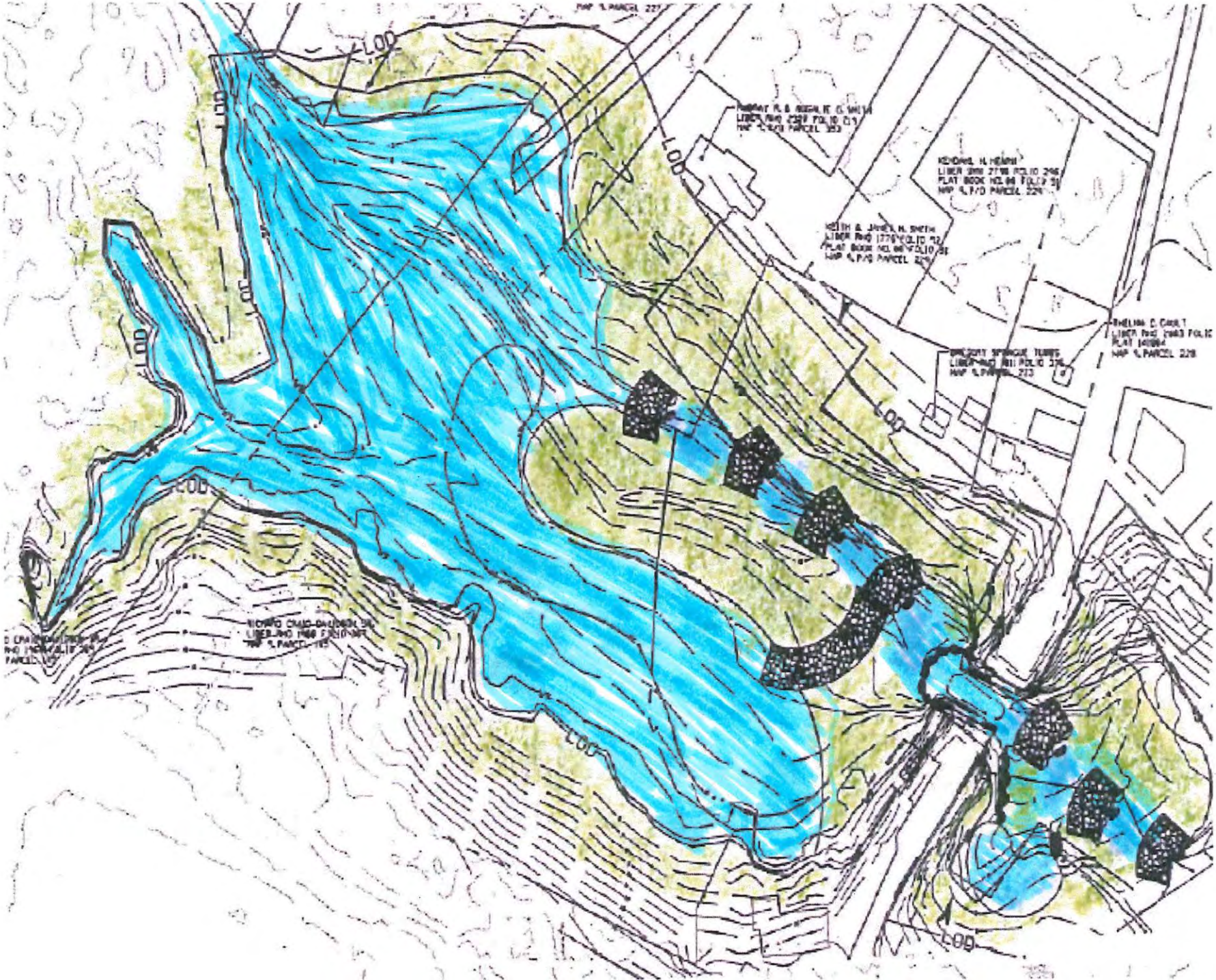
Juveniles in Bunting Br

Mature eel heading to sea to spawn


First visit to the site I counted more
than 50 turtles squashed on the road

Local Community Involvement

- Need to understand community's outlook
- What do they want, what are their concerns?
- Effective communication about project
  - Why its being undertaken, its benefits, who is behind the project
  - What it will look like and how it affects them (e.g., property values, water table, flooding changes,…)
  - How will it be executed and when (e.g., start date, duration, etc.)

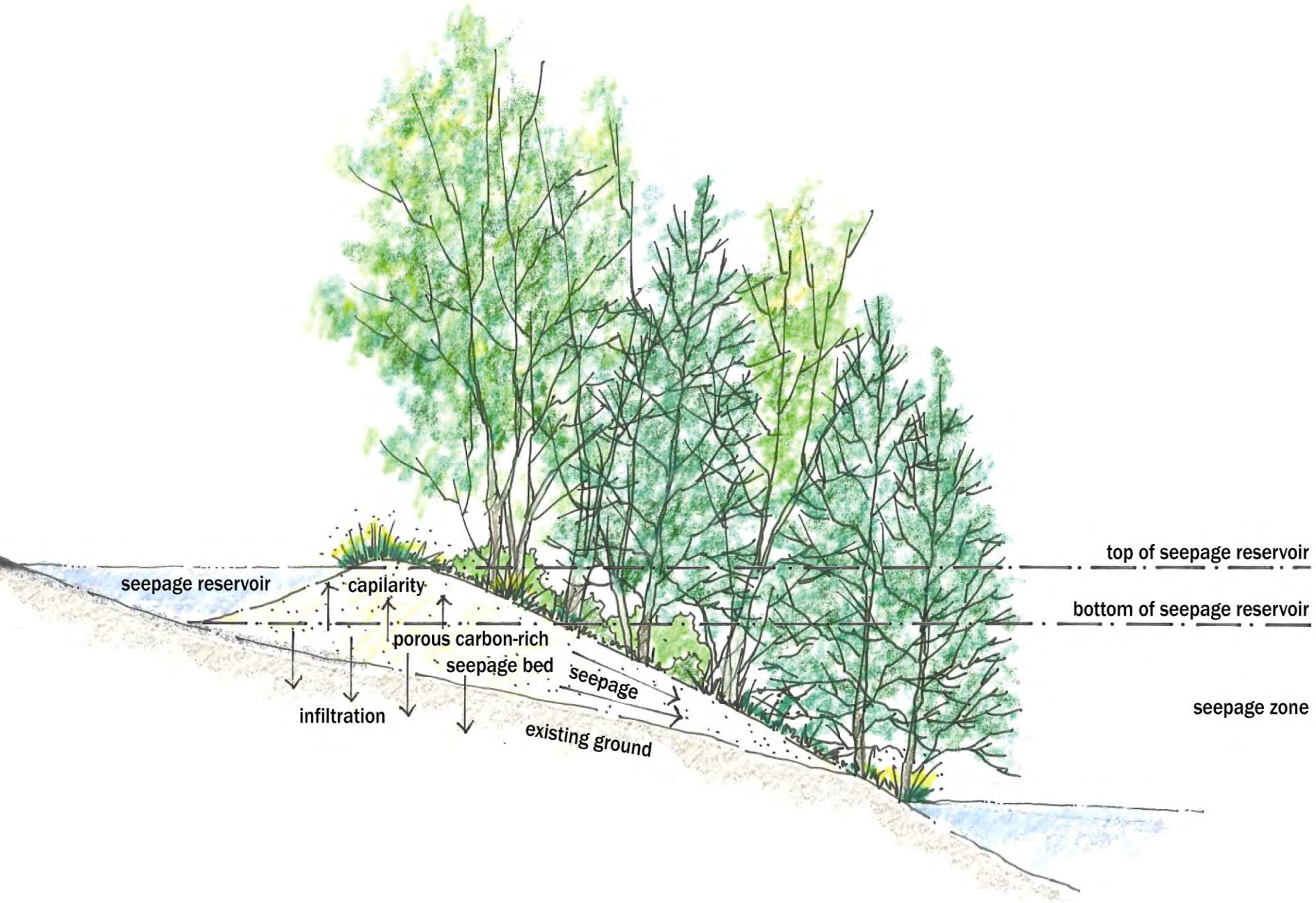

LOD
LOD
LOD
LOD
LOD
LOD

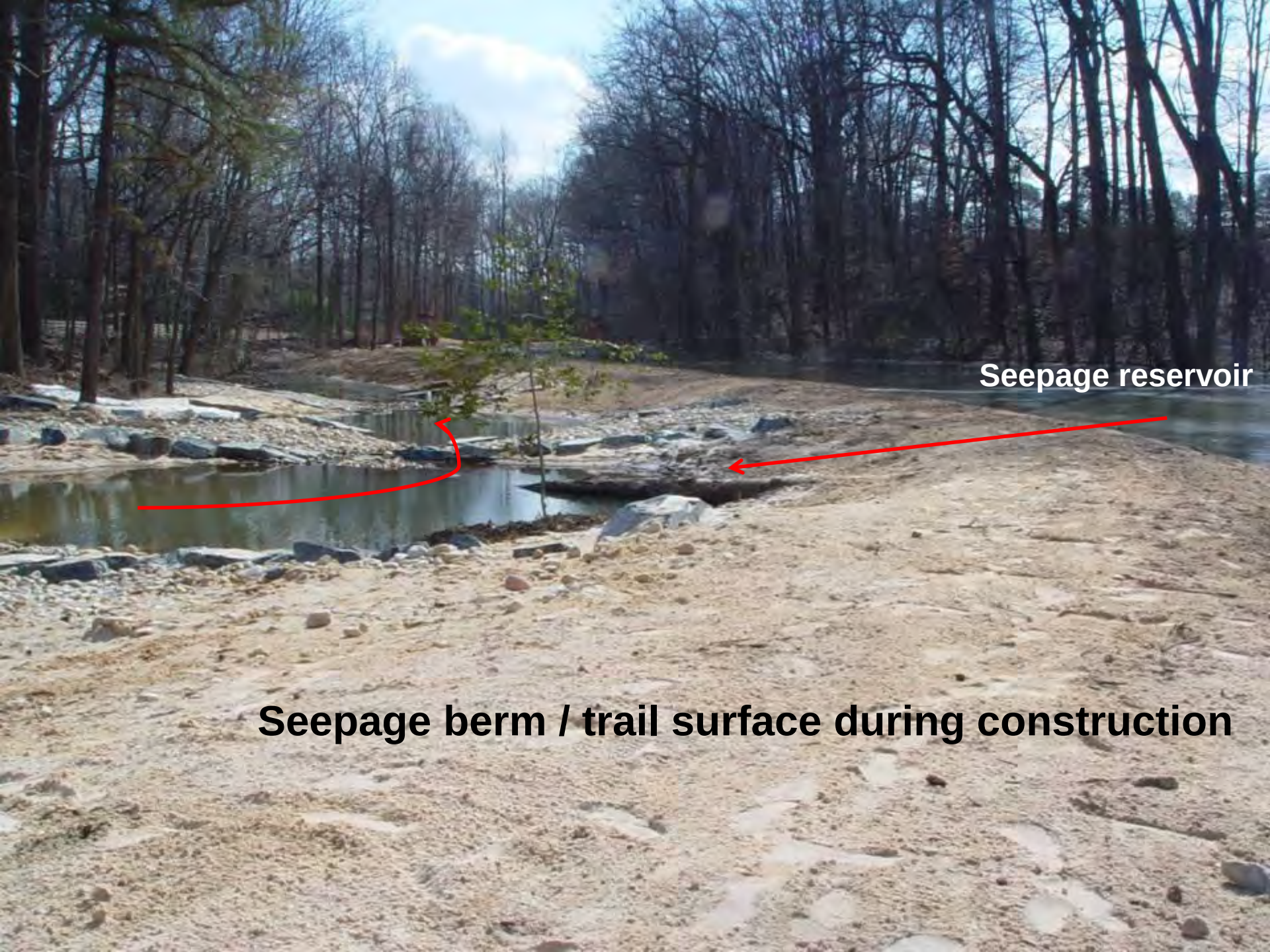

Low tide


High tide

Simulation for Adjacent Property Owners


Actual appearance after 1 growing season


top of seepage reservoir
seepage reservoir
capilarity
bottom of seepage reservoir
porous carbon-rich
seepage bed
seepage
seepage zone
infiltration
existing ground



Seepage berm / trail surface during construction


Dynamic soil system, not static sand bed


MACK
STO 344
08 . 19 . 2014


09.10.2014


08 . 20 . 2014


09.14.2014


Critical Area Constraint

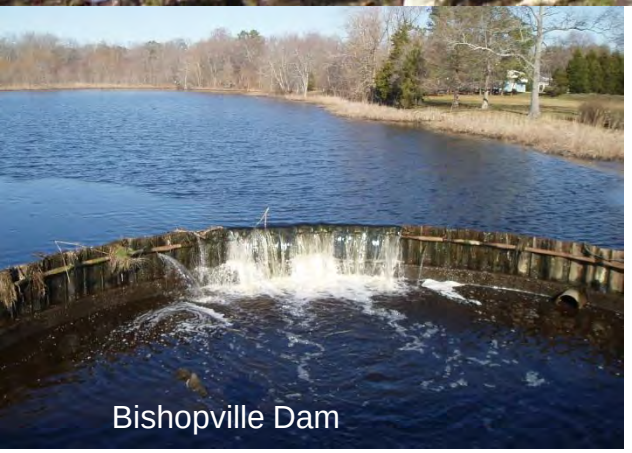

12 .05 .2014


12 . 30 . 2014


Bank St
Bishopville Rd
Bishopville, MD 21813
Hotel Rd
368


01.24.2015 16:36

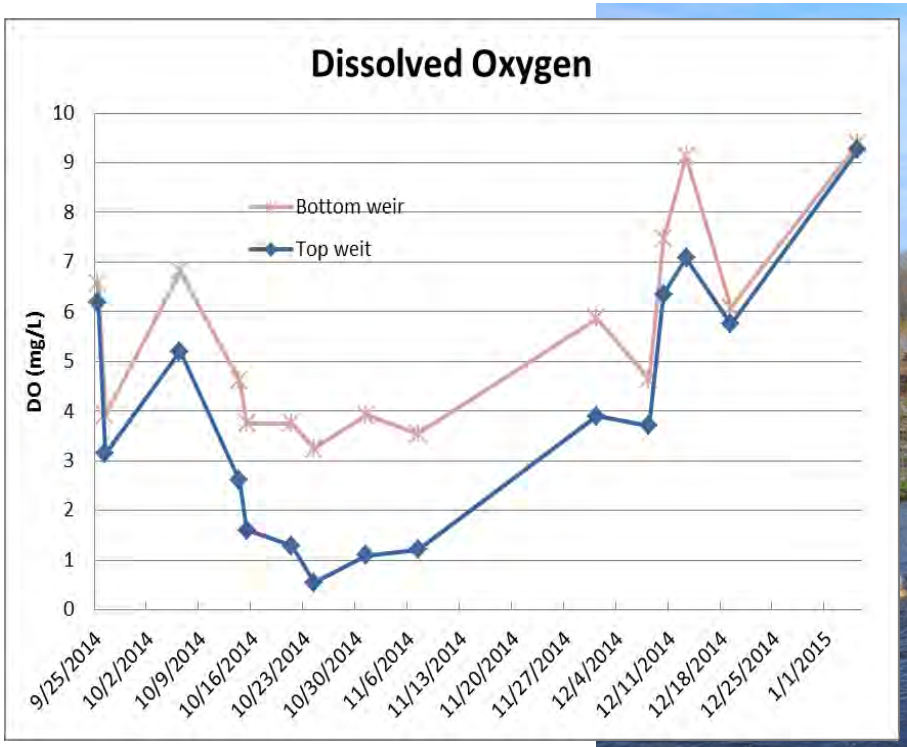
Richard Davidson (landowner)
Kevin Smith (DNR)
Keith Underwood (Underwood & Associates)
Joe Berg (Biohabitats)
Steve Kopecky (COE)
Sandy Coyman (Worcester CO)
Rob Shreeve (SHA)
Steve Dawson (DNR)
Roman Jesien (MCBP)
Joe Kincaid (MDE)
Ellen Cummings (COE)

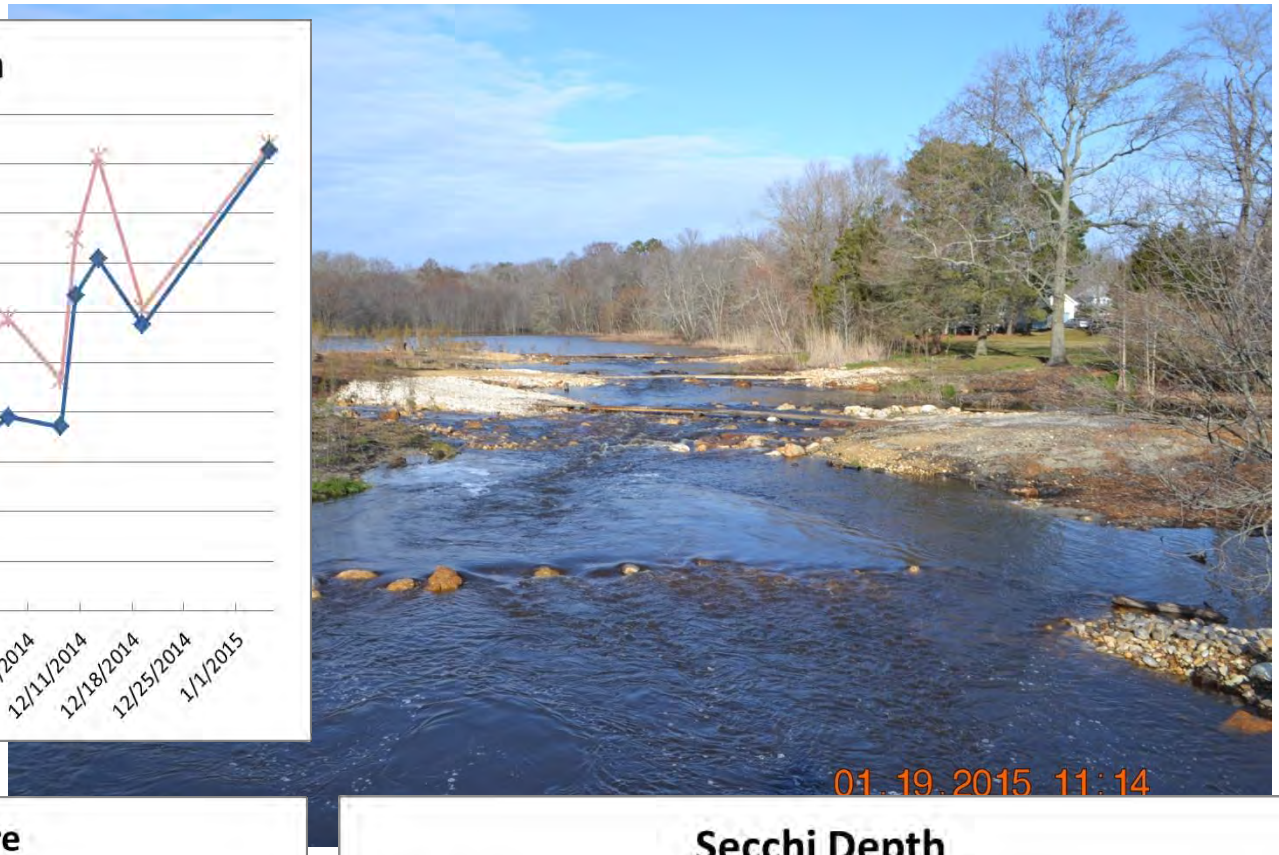


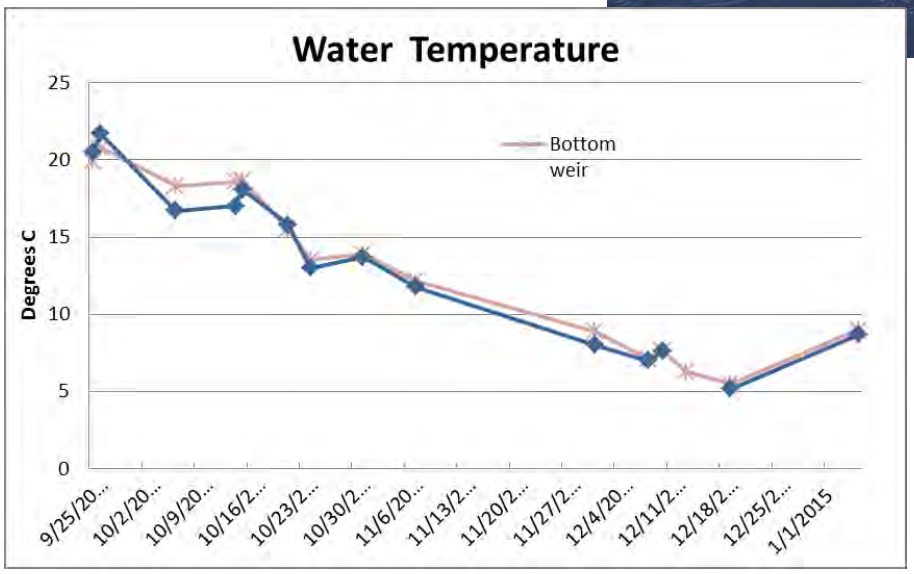
Bishopville Dam, MD
Feb 7, 2006 Kickoff

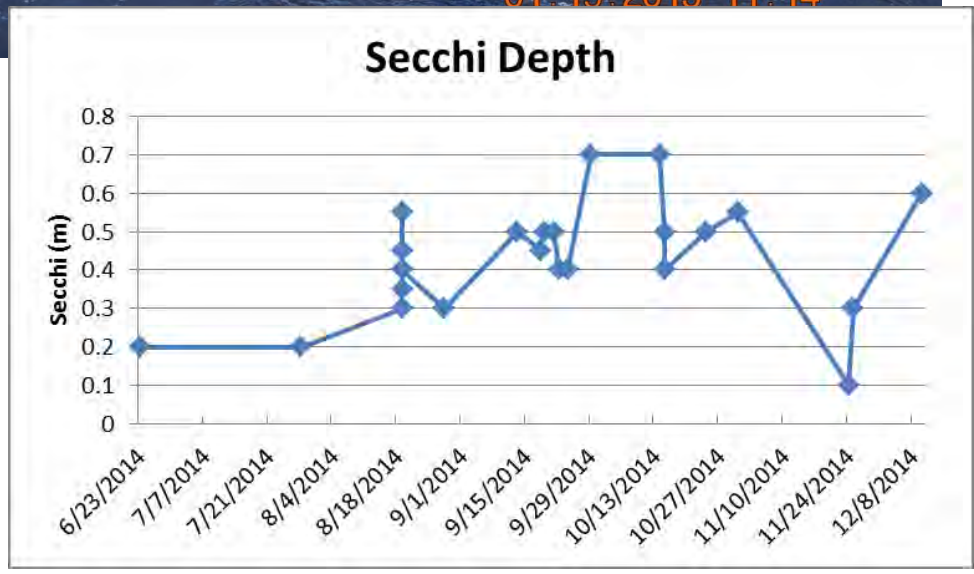
Summer 2014
Construction Start

Spring 2015
Perch, alewife and eel move upstream


Dissolved Oxygen
DO (mg/L)
Bottom weir
Top weit
10
9
8
7
6
5
4
3
2
1
0
9/25/2014
10/2/2014
10/9/2014
10/16/2014
10/23/2014
10/30/2014
11/6/2014
11/13/2014
11/20/2014
11/27/2014
12/4/2014
12/11/2014
12/18/2014
12/25/2014
1/1/2015


01.19.2015 11:14


Water Temperature
Degrees C
Bottom weir
25
20
15
10
5
0
9/25/20...
10/2/20...
10/9/20...
10/16/2...
10/23/2...
10/30/2...
11/6/20...
11/13/2...
11/20/2...
11/27/2...
12/4/20...
12/11/2...
12/18/2...
12/25/2...
1/1/2015

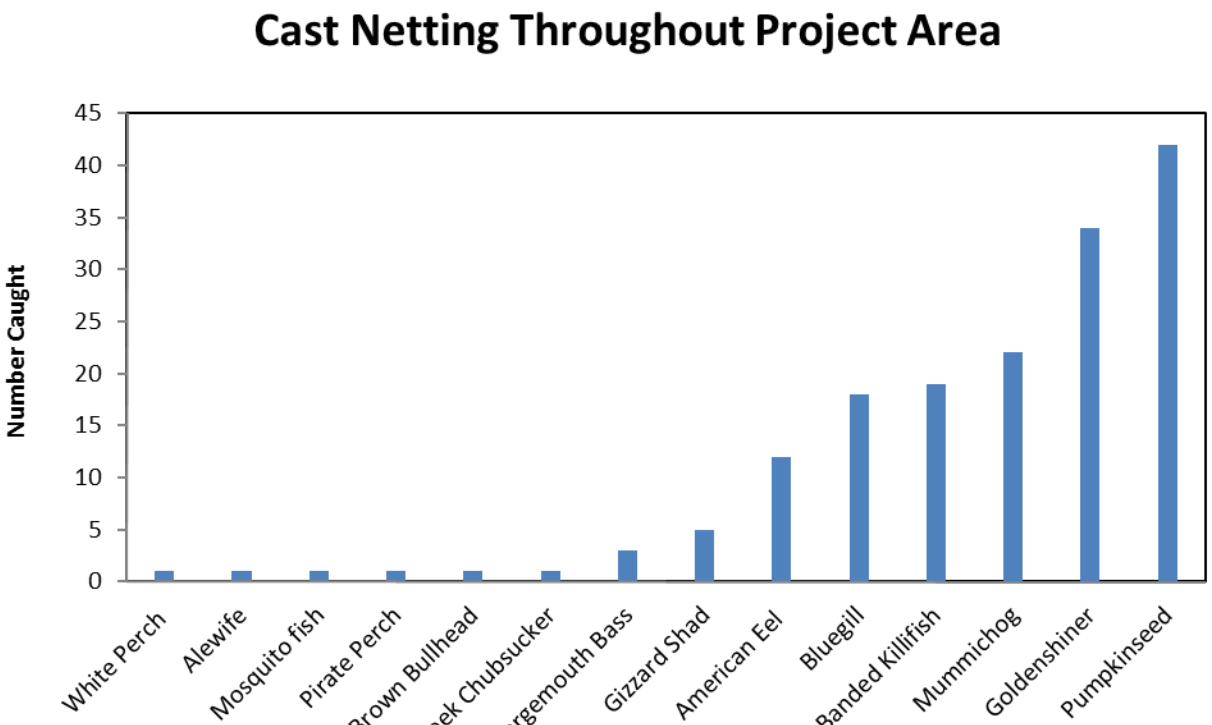

Secchi Depth
Secchi (m)
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
6/23/2014
7/7/2014
7/21/2014
8/4/2014
8/18/2014
9/1/2014
9/15/2014
9/29/2014
10/13/2014
10/27/2014
11/10/2014
11/24/2014
12/8/2014

Classroom instruction

Volunteer opportunities

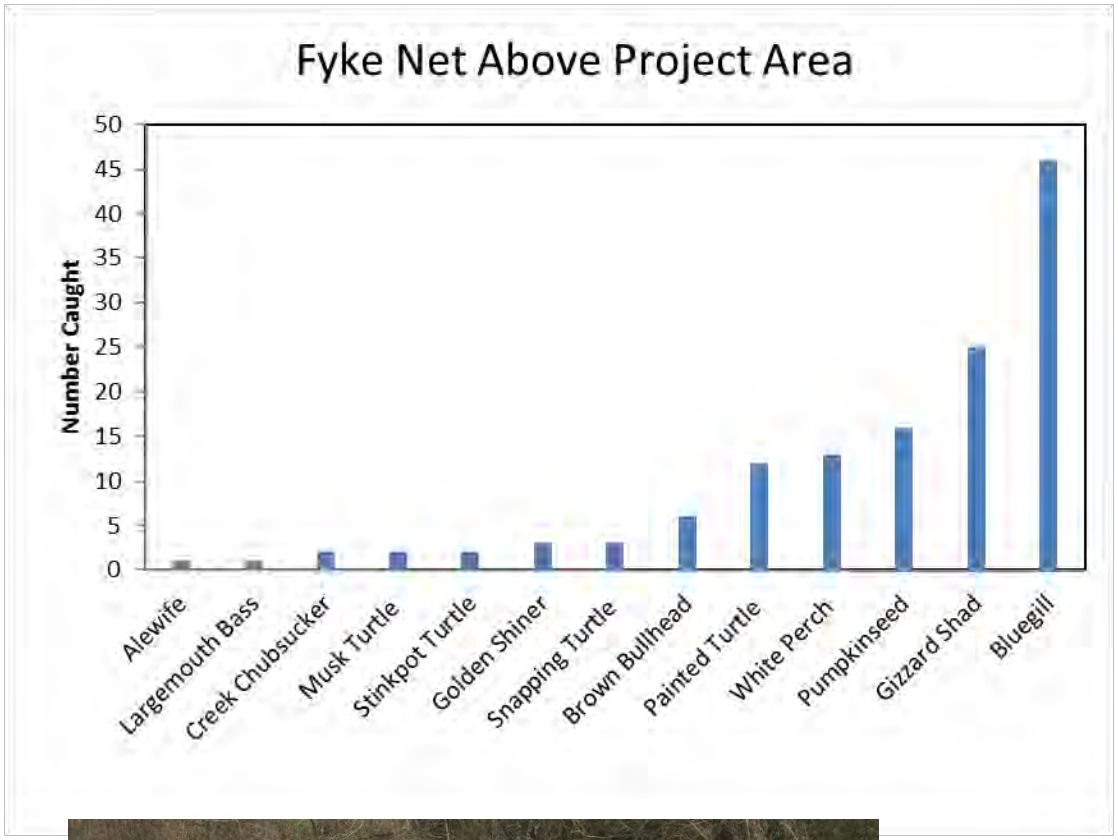
Sampled from
Mar 30 - June 5 2015

117 individuals
14 species



Sampled from
April 7 - May 25, 2015

113 Individuals
10 fish species
3 turtle species



Documented Benefits

- 'Restored' runs of white perch and alewife
- Elimination of turtle loss on Md 367
- Reduction of anoxic discharges to Coastal Bays