

# Northern Pike and Muskellunge in Maryland



Muskellunge aka "Muskie"

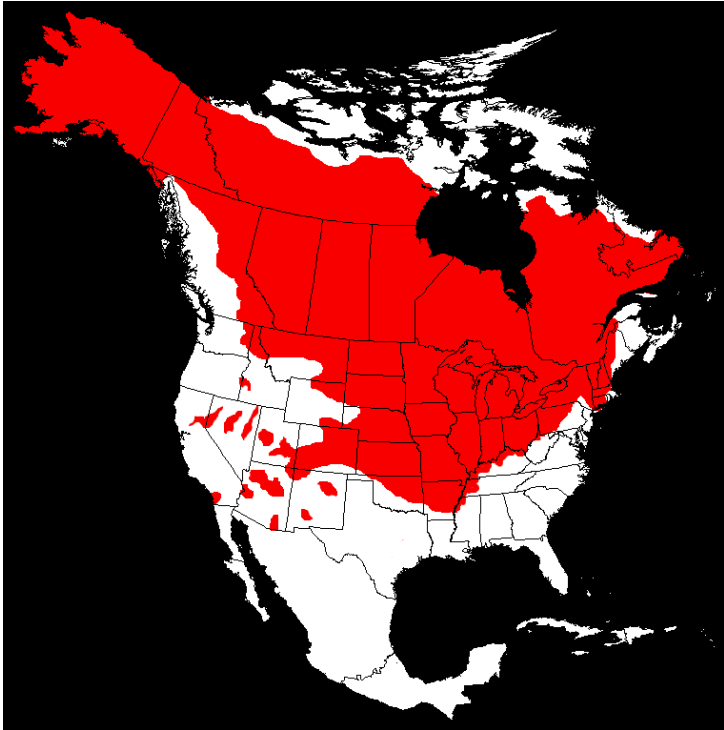
Potomac  
River



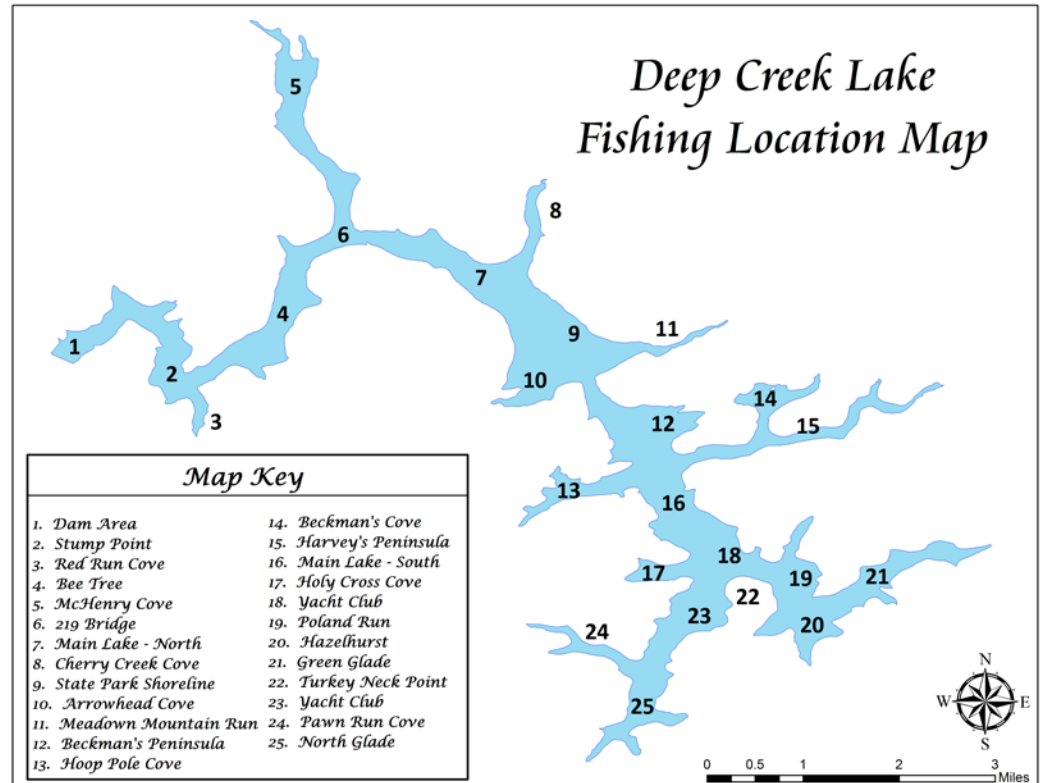
Northern Pike

Deep Creek Lake  
Loch Raven Reservoir  
Rocky Gorge Reservoir  
Triadelphia Reservoir

# Deep Creek Lake Northern Pike



Current range of Northern Pike



## Deep Creek Lake

- Largest impoundment in MD (Garrett Co.)
- 3,900 acres

# Deep Creek Lake Northern Pike



“What do we know?”

- Trophy specimens present
- NP are difficult to sample
- Some harvest occurs
- Anglers like big fish!

## Management Objectives

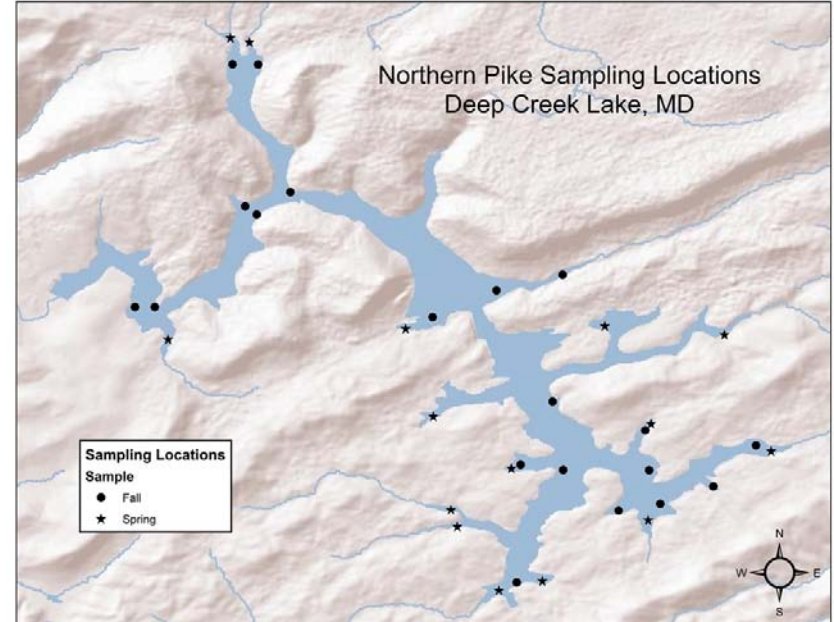
“What we need to know”

- Fishery Independent Data (resource)
  - Age
  - Growth
  - Maturity
  - Size distribution
  - Relative abundance
  - Efficient/accurate sampling methods
  - Provide big fish!
- Fishery Dependent Data (anglers)
  - Effort (targeted species?)
  - Harvest
  - Mortality

# Deep Creek Lake Northern Pike

## Fishery Independent Surveys

- Spring electrofishing
  - target spawning coves
  - $< 50^{\circ}\text{F}$



# Deep Creek Lake Northern Pike



## Fishery Independent Surveys

-Spring hoop nets

-additional fish for life history data



Garrett  
Co in  
March is  
cold!!



Male #19 tagged on 9/29/14 at 29" and age 7  
Recaptured on 3/30/17 at 29.65" at age 10  
- 913 days at large, .26" growth per year

# Deep Creek Lake Northern Pike



## Fishery Dependent and Independent Surveys

- Statewide angler preference survey
- Tagging Study



Female #42 tagged on 10/14/15 at 38.5"  
 Recaptured on 2/21/17 at 39"  
 - 496 days at large, .37" growth per year



### ATTENTION ANGLERS

#### TAGGING STUDY

Northern pike in Deep Creek Lake are currently part of an on-going research project. If you catch a tagged fish, we ask that you report it by calling 301-689-7168.

#### RECORD THE FOLLOWING INFORMATION:

- |                |                                |
|----------------|--------------------------------|
| 1. TAG NUMBER  | 3. LOCATION OF CAPTURE         |
| 2. DATE CAUGHT | 4. LENGTH, TO NEAREST 1/8 INCH |
|                | 5. KEPT OR RELEASED            |

#### DO NOT REMOVE TAG FROM FISH

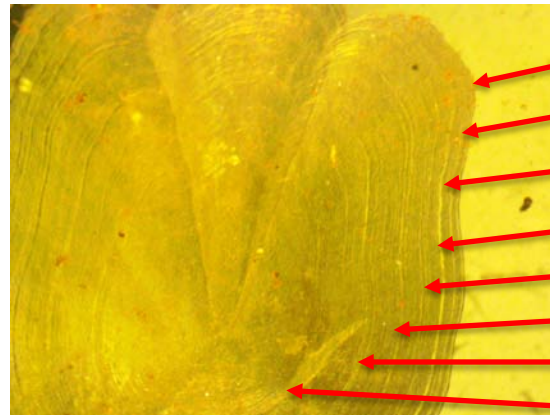
Once the information is recorded, we strongly encourage you to release all tagged fish so that we may continue to learn from them. Any angler who reports a tagged fish will be eligible for a reward.



See the Maryland Fishing & Crabbing Guide for additional information

[DNR.MARYLAND.GOV/FISHERIES](http://DNR.MARYLAND.GOV/FISHERIES)

MARYLAND FISHING AND BOATING SERVICES 410-260-8320  
 CATCH-A-POACHER HOTLINE 800-635-6124



- 8
- 7
- 6
- 5
- 4
- 3
- 2
- 1

Tagging data will help verify age estimates from scales and fishing mortality

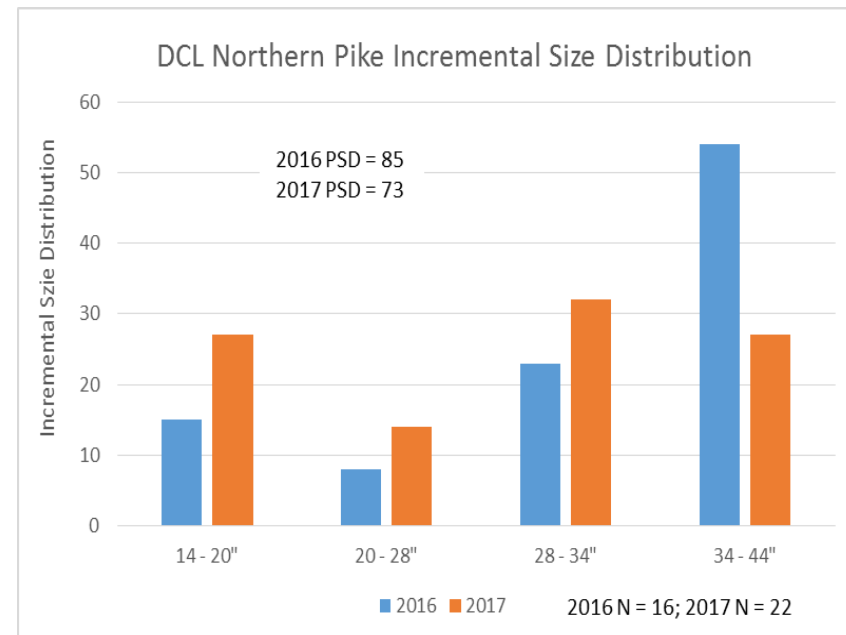
# Deep Creek Lake Northern Pike



## What have we learned?

- Spring electrofishing at fixed sites most precise for relative abundance
- Size distribution suggests that recruitment is low...or surveys are size biased.
- A 16.4" female was found to be mature!
- Largest male collected to date measured 31.3" (only two of 18 male pike to reach 30" minimum size limit)

	<u>2016</u>	<u>2017</u>
Mean (CPUE)	4.52	6.47
	(2.21 and 9.08 to detect change)	

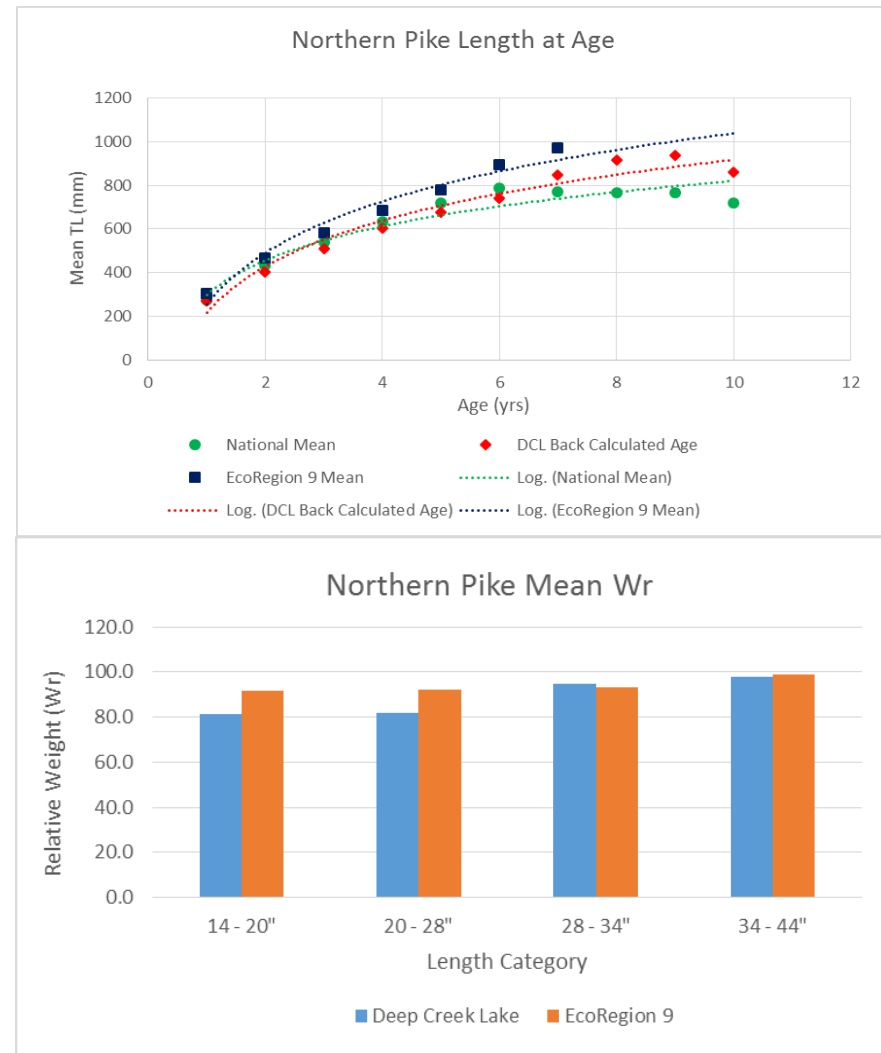


# Deep Creek Lake Northern Pike



## What have we learned?

- Growth is greater than National average but less than EcoRegion 9 (Midwest)
- Average time to reach 30" minimum size is 6.2 years
- Theoretical maximum age is 10.8
- Total annual mortality estimated at 44% from catch curve (number of fish at age)
- Harvest rate estimated at 20%
- 2 of the 8 tagged fish recaptured by angling were kept (24%) – both by ice fishing
- Body condition less than EcoRegion 9 for sublegal fish, similar for larger fish





# Deep Creek Lake Northern Pike



## What's Next?

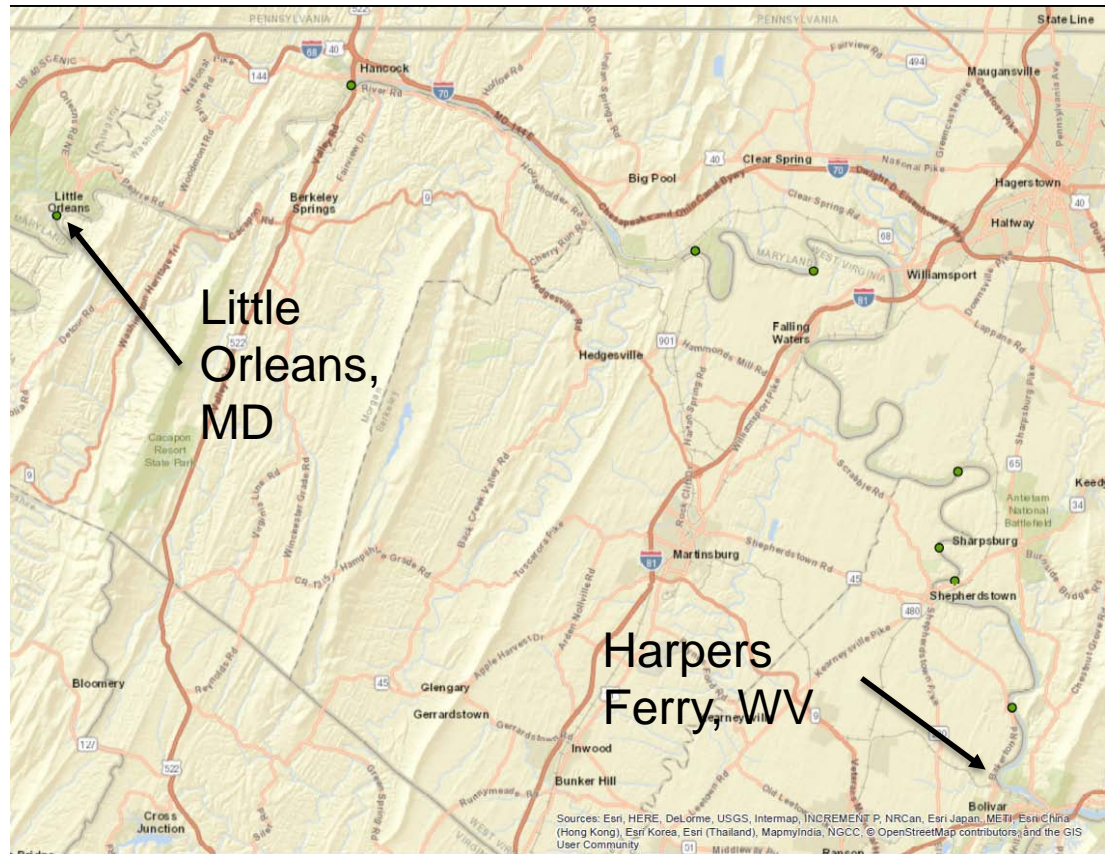
- Monitor relative abundance using standardized spring electrofishing survey
- Continue to gather life history and angler catch and harvest data through tagging project
- Use life history data and angler catch data to model population under various length limit options to determine if fishery can be improved by regulations.



# Potomac River Muskie

## Maryland's Only Muskie Fishery

Strongest population occurs in eastern Allegany and Washington Counties



# Potomac River Muskie



## History

- Tiger Muskie (muskellunge X N. Pike) sterile hybrid stocked from 1989 – 2006)
- Origin of pure strain muskie a mystery
  - Adults observed in late 80s with reproduction documented in 1995
- Population supported entirely by natural reproduction



- 36" minimum size, 1 fish per day creel (1997)



# Potomac River Muskie



## Management Objectives

- Maintain a high quality fishery with a desirable size distribution
- Continue ongoing tagging study and [Angler Creel Diary Program](#)

### Objectives

- Obtain estimates of angler effort, catch, and harvest
- Obtain a larger data set of muskie lengths than could be obtained by standard surveys
- Use larger data set to increase catch curve precision



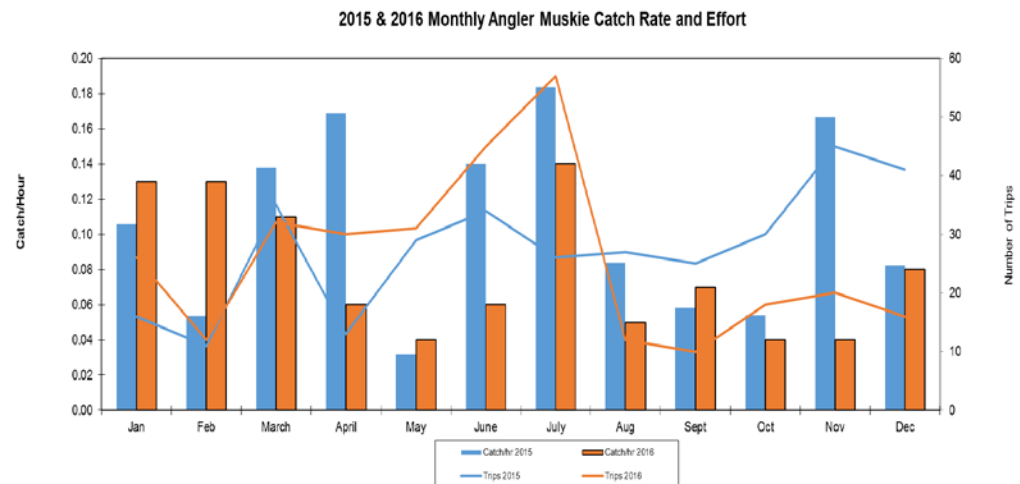
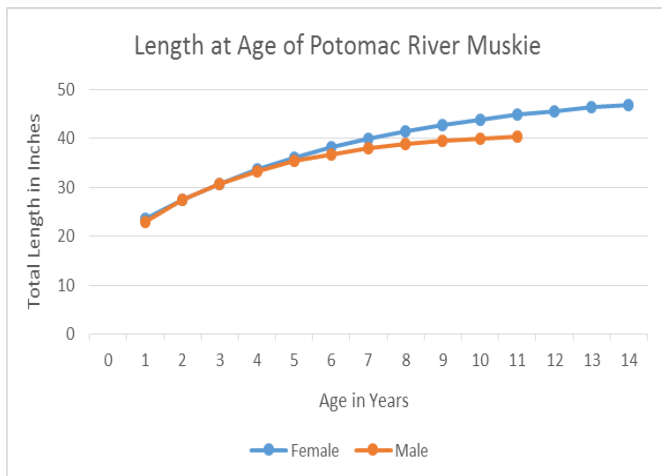
# Potomac River Muskie



## Potomac Muskie Life History and Fishery Dependent Survey Results

- Males mature at age 3, females at age 4
- Overall  $L_{\infty} = 50.4''$
- Total annual mort. = 22%
- Harvest estimated to be 2.7% (~ 1% tagging study)

Year	2010	2011	2012	2013	2014	2015	2016
# Muskie Caught	94	205	226	168	212	180	119
Angler Hrs	545	1413	2988	2633	2839	1771	1479.5
Total Catch/Hr	<b>0.17</b>	<b>0.15</b>	<b>0.08</b>	<b>0.06</b>	<b>0.07</b>	<b>0.10</b>	<b>0.08</b>
# Trips	67	172	295	321	378	332	309
Hrs to Catch	<b>5.9</b>	<b>6.7</b>	<b>12.5</b>	<b>15.7</b>	<b>13.5</b>	<b>9.8</b>	<b>12.4</b>
# of Participants	5	10	15	16	15	13	12
recaptures	14	19	15	12	20	14	6
% recaptures	14.9	9.3	6.6	7.1	9.4	7.8	5
Av. muskie length	36.4	35.4	36.0	36.8	36.0	36.1	37.1



# Potomac River Muskie



## Potomac Muskie Telemetry Study – 2017 & 2018



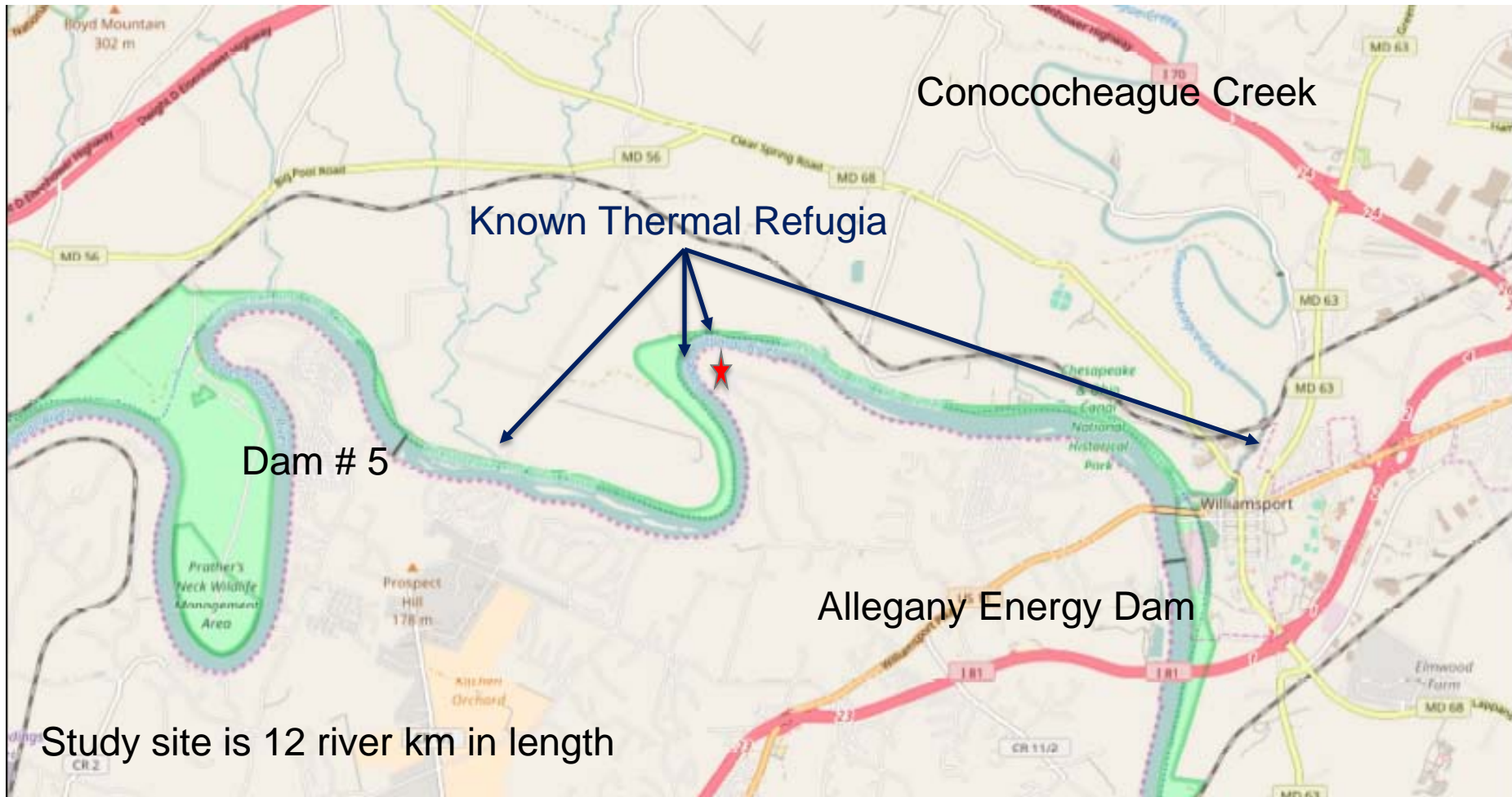
### Study Goals

- Identify seasonal habitat use and important habitat features (spawning habitat, thermal refugia)
- Determine direct and indirect angling mortality of fish targeted at thermal refugia sites

# Potomac River Muskie



## Potomac Muskie Telemetry Study – Site Map



Study site is 12 river km in length

# Potomac River Muskie



## Potomac Muskie Telemetry Study – 2017 & 2018



A total of 14 adult pre-spawn muskie (7 male, 7 female) were collected by electrofishing

A surgery station was set up on a small, centrally located island





# Potomac River Muskie



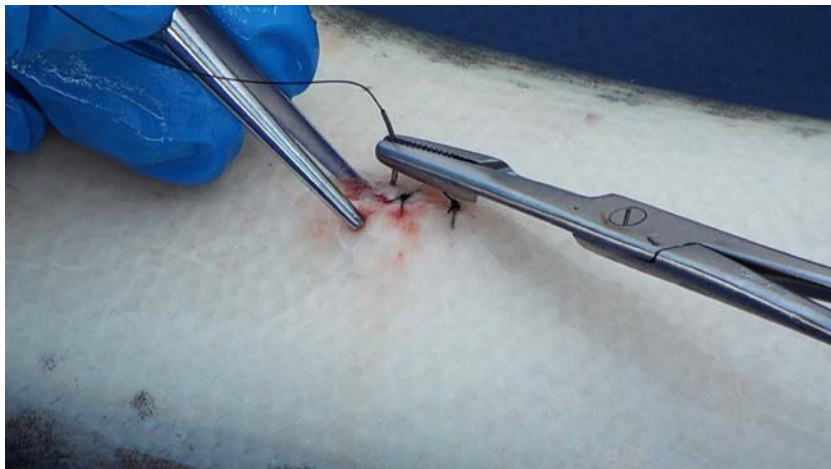
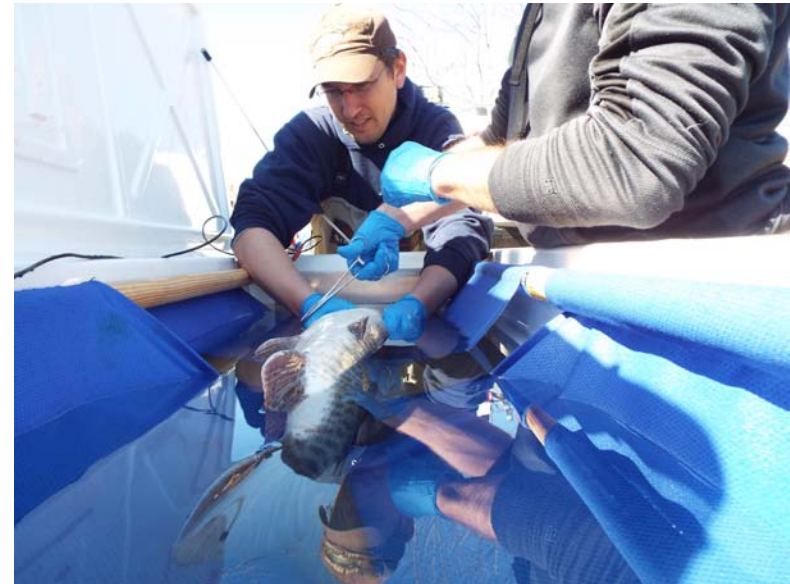
Muskie were measured, weighed, double tagged, and placed in electronarcosis tank in preparation for surgery



# Potomac River Muskie



ATS  
Series  
F1170  
transmitter



Recovery  
cage

# Potomac River Muskie



2017 Study Summary Map



- Biweekly sampling for life of transmitter (~400 days)
- GPS coordinates, water quality, depth, and flow recorded for each located fish

# Potomac River Muskie



## Potomac Muskie Telemetry Study – Outcomes

- Identify important habitat (spawning/thermal refugia) and protect through Environmental Review process
- Determine direct and indirect angling mortality of fish targeted at thermal refugia sites
  - Angler outreach to improve fish handling and survival
  - Regulations (impractical)



# Northern Pike and Muskellunge in Maryland



## For more information about DCL Northern Pike contact:

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