



# Maryland State Lakes Protection and Restoration Fund



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Maryland Department of Natural Resources – Tidewater Ecosystem Assessment

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# Background: Hydrilla found in Deep Creek Lake

- 2013: Hydrilla discovered in Deep Creek Lake; likely introduced through recreational boating.
- 2014: The department initiated five to seven years of herbicide treatments for hydrilla control and a voluntary launch steward program to inspect vessels launching at Deep Creek Lake State Park.
- 2020: Ongoing herbicide treatments and launch steward program.



# Background: Maryland House Bill 860

## House Bill 860 (2015)

- Aquatic Invasive Species – Inspection and Decontamination of Vessels (State Lakes Invasive Species Act of 2015)
  - After April 1, 2017, it was illegal for the owner of a vessel to launch in Maryland waters unless the owner has cleaned the vessel and removed all visible organic material.
  - Violators subject to fines of up to \$2,500 for introducing Aquatic Invasive Species.
  - Department required to convene a workgroup to evaluate actions that reduce the spread of aquatic invasive species from vessels placed in 16 lakes owned and/or managed by the state.

## House Bill 860 Workgroup

- Convened Summer 2015
  - Recommended actions to reduce the spread of aquatic invasive species from vessels placed in lakes that are owned or managed by the state.
  - To continue the voluntary vessel inspection and education/outreach.
  - Lake management units would identify the most appropriate aquatic invasive species options to implement at each lake.
  - Conducted baseline survey of all 16 state owned lakes.
  - Provided a written report to the legislature by December 31, 2015.

# Background:

## Survey of Aquatic Invasive Species in Lakes

- To establish a baseline, in the summer of 2016 department biologists visited each state lake and gathered data on submerged aquatic vegetation, mollusks, and algae.
- 29 species of submerged aquatic vegetation and six species of floating or emergent plants were documented during this survey. Invasive species were found in 11 of 16 lakes.
- Results are summarized in a report: <https://dnr.maryland.gov/Invasives/Documents/Aquatic-Invasive-Reservoir-Summary.pdf>



# Background: Senate Bills 396 & 501

## Senate Bill 396 (2017) - Protection and Restoration of State-owned Lakes

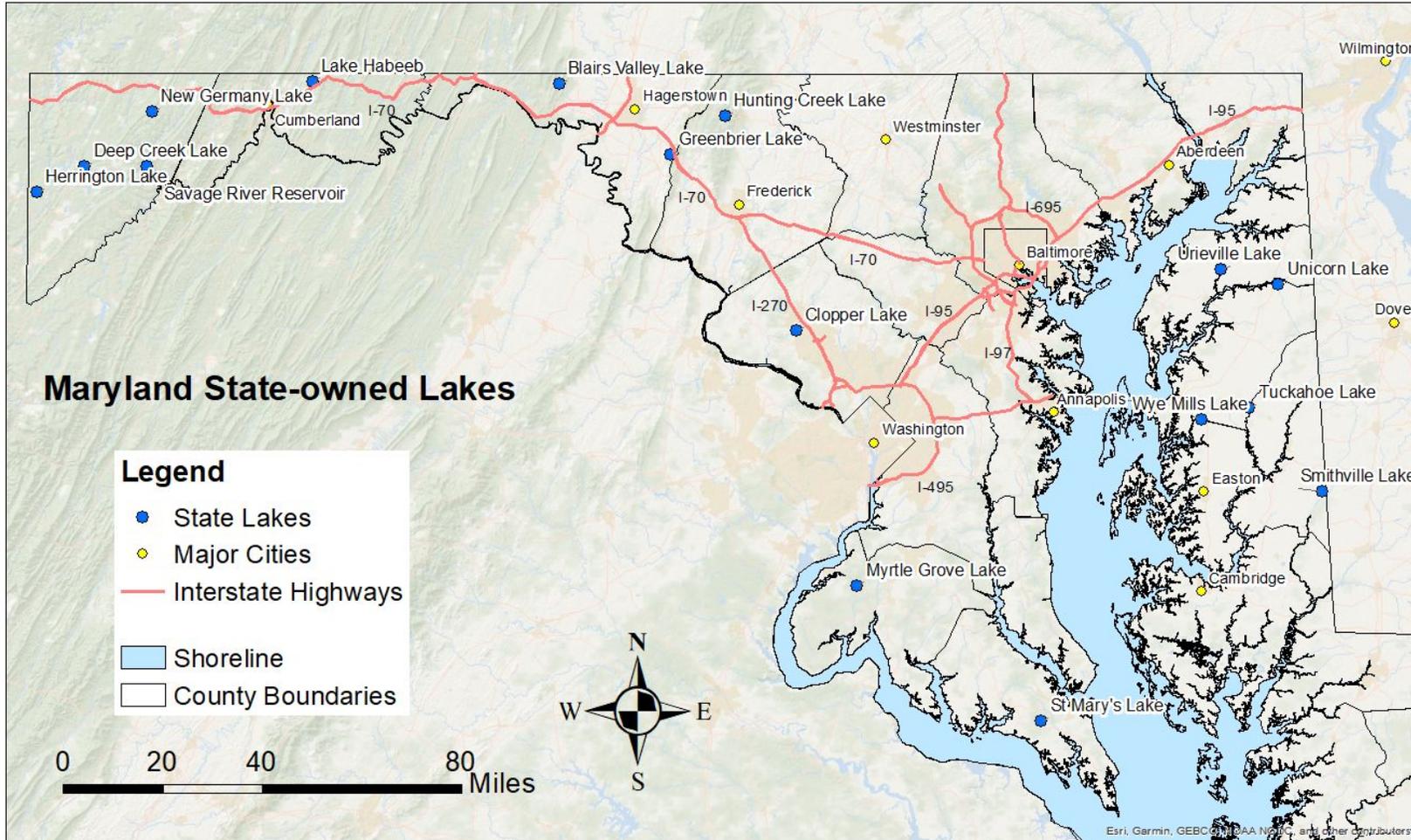
- Established the State Lakes Protection and Restoration Fund as a special, non-lapsing fund.
- Specified the **purpose of the fund is to protect and restore state-owned lakes.**
- Required the Department of Natural Resources to develop a specified budget.
- Required the department, in coordination with local governments, organizations, and citizens, to develop an annual work plan that prioritizes and details projects that will receive funding from the fund.

## Senate Bill 501 (2018) - State Lakes Protection and Restoration Fund

- The governor approved the plan on May 15, 2018.
- Funding is \$1 million annually beginning in Fiscal Year 2020 and each following fiscal year for a total of three years.
- Purpose of the fund is to protect state-owned or state managed lakes by:
  - o Removing sediment
  - o Treating contaminated sediment
  - o Preventing the spread of invasive species
  - o Improving ecological and recreational value
  - o Taking any other action the department deems necessary



# 16 State-Owned Lakes



Name	County	Type of State Land
Blair's Valley Lake	Washington	Wildlife Management Area
Clopper Lake	Montgomery	State Park
Deep Creek Lake	Garrett	State Park
Greenbrier Lake	Washington	State Park
Herrington Lake	Garrett	State Park
Hunting Creek Lake	Frederick	State Park
Lake Habeeb	Allegany	State Park
Myrtle Grove Lake	Charles	Wildlife Management Area
New Germany Lake	Garrett	State Park
Savage River Reservoir	Garrett	State Park
Smithville Lake	Caroline	Fisheries Management Area
St Mary's Lake	St. Mary's	State Park
Tuckahoe Lake	Caroline	State Park
Unicorn Lake	Queen Anne's	Fisheries Management Area
Urieville Lake	Kent	Fisheries Management Area
Wye Mills Lake	Queen Anne's	Fisheries Management Area

# Status of Maryland Lakes

## Lakes of Maryland

- No naturally formed lakes
- Hundreds of artificial water bodies: lakes, ponds, reservoirs, etc.
- Popular for outdoor recreation: fishing, swimming, boating, etc.
- State-owned lakes managed by three DNR units:
  - Maryland Park Service
  - Fishing and Boating Service
  - Wildlife and Heritage Service

## Challenges to our Aging Lakes

- Almost all are 50 years old or older.
- They often are filled with nutrient bearing sediments, growing shallower, and colonized by native and non-native submerged aquatic vegetation that are ecologically beneficial but can impede recreation.
- Naturally occurring algae increase as lakes become eutrophic due to nutrient pollution. Harmful/toxic algal blooms occur regularly in some lakes.
- Most state-owned lakes aren't used for drinking water and are not a focus for water quality monitoring.

# Potential Lake Enhancements



Dredging to increase water depth



Invasive species removal: fish



Invasive species removal:  
aquatic plants



Aquatic habitat enhancement:  
in-water structures

# Potential Future Lake Enhancements



Water quality assessments



SAV assessments



Native SAV restoration



HAB assessment



Herbicide Treatments



Launch steward program

## Other ideas:

- Spawning area improvements: in-water grading, gravel installation
- Shoreline stabilization

# 2019 and 2020 Projects Underway

## Blairs Valley Lake

- Treatment to control hydrilla
- harmful algae bloom monitoring and assessment
- Sediment evaluation for potential dredging
- Reef ball deployment

## Clopper Lake (Seneca Creek State Park)

- Harmful algae bloom monitoring and assessment
- Treatment to control hydrilla
- Sediment evaluation for potential dredging\*
- Reef ball deployment

## Deep Creek Lake

- Reef ball deployment
- Shoreline stabilization cost-share program
- Treatment to control hydrilla

## Greenbrier Lake

- Sediment evaluation for potential dredging\*

## Herrington Lake (Herrington Manor State Park)

- Sediment evaluation for potential dredging
- Deploying fish habitat enhancement structures
- Replace limestone sand in headwaters

## Hunting Creek Lake (Cunningham Falls State Park)

- Sediment evaluation for potential dredging
- Continue harmful algae bloom assessment
- Invasive submerged aquatic vegetation treatment (spiny naiad)
- Reef ball deployment

## Lake Habeeb (Rocky Gap SP)

- Invasive submerged aquatic vegetation treatment (hydrilla)
- Reef Ball Deployment

## Myrtle Grove Lake

- Create and place fish structures in the lake\*
- Conduct sediment evaluation\*
- Dredge in designated areas for nutrient removal\*

## New Germany Lake

- Sediment Evaluation for potential dredging

## Smithville Lake

- Harmful algae bloom assessment

## St Mary's Lake

- Submerged aquatic vegetation restoration
- Sediment evaluation for potential dredging\*

## Tuckahoe Lake

- Harmful algae bloom assessment
- Sediment evaluation for potential dredging\*

## Unicorn Lake

- Harmful algae bloom assessment

## Urieville Lake

- Harmful algae bloom assessment
- Partial lake dredging

## Wye Mills Lake

- Continue harmful algae bloom assessment
- Sediment evaluation for potential dredging
- Bathymetric mapping

\*postponed due to Covid-19

# Maryland State Lakes Protection and Restoration Fund 2020 Treatment Results

## Clopper Lake



Invasive treated - Hydrilla (*Hydrilla verticillata*)  
 Acres treated/herbicide - Six acres treated with Sonar ONE  
 Frequency of treatment - Three treatments, three weeks apart  
 Observations - No hydrilla observed in any treated areas

Herbicide projects completed at six state lakes (Deep Creek Lake summarized separately)

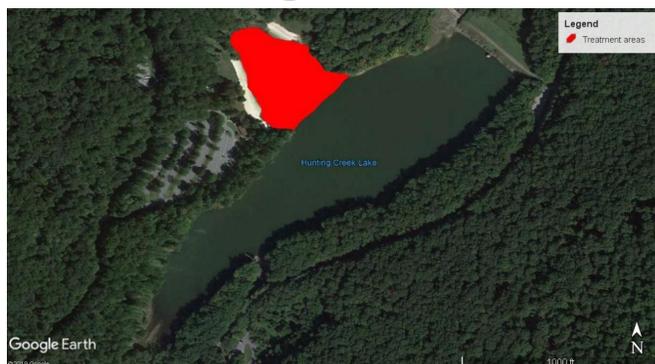
- Positive control observed at each lake
- No impacts to day-to-day park operations
- No adverse water quality effects
- All lake managers interested in continuing treatments in 2021

## Blair's Valley Lake



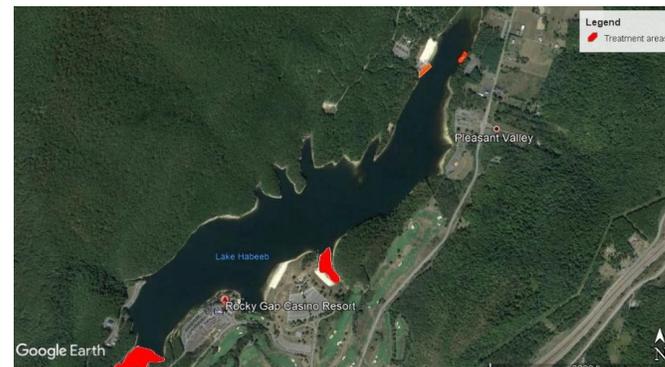
Invasive treated - hydrilla  
 Acres treated/herbicide - Thirty-two acres treated with Sonar AS  
 Frequency of treatment - Four treatments, three weeks apart  
 Observations - No hydrilla observed in the entire lake

## Hunting Creek Lake



Invasive treated - Spiny naiad (*Najas minor*)  
 Acres treated/herbicide - Six acres treated with Clipper and Reward  
 Frequency of treatment - One treatment  
 Observations - No spiny naiad observed in any treated areas

## Lake Habeeb



Invasive treated - hydrilla  
 Acres treated/herbicide - Six acres treated with Sonar ONE and Komeen Crystal  
 Frequency of treatment - Three treatments, three weeks apart  
 Observations - Hydrilla observed but very reduced in treated areas

## Tuckahoe Lake



Invasive treated - Smartweed (*Polygonum hydropiperoides*)  
 Acres treated/herbicide - Six acres treated with Clearcast  
 Frequency of treatment - One treatment  
 Observations - Incomplete control with regrowth

# 2020 Deep Creek Lake Hydrilla Treatment

- 73 Acres in DCL treated to control for the aquatic invasive plant *Hydrilla verticillata*.
- Treatments took place on:
  - Monday June 8, 2020
  - Tuesday June 30, 2020
  - Tuesday July 21, 2020
  - Tuesday August 18, 2020
- A new bed of hydrilla was found in Windy Cove September 4, 2020
  - A 1 acre area around that bed was treated a week later with a herbicide.
  - The location is denoted by a  on the adjacent map.



# Harmful Algae Monitoring in Lakes

- Summer 2020: Seven lakes sampled:
  - Eastern Shore (Smithville, Tuckahoe, Unicorn, Urieville, Wye Mills)
  - Central Maryland (Clopper, Hunting Creek)
- 2019: Eight lakes sampled (same as 2020, plus Greenbriar).
- No harmful algae detected in Tuckahoe.
- Potentially toxic cyanobacteria found in six lakes:
  - Clopper, Hunting, Smithville, Unicorn, Urieville, Wye Mills
  - Filamentous algae mats potential toxin production
    - Lyngbya: Hunting Creek, Unicorn, Urieville, Smithville and Wye Mills
    - *Microseria wollei*: Unicorn, Urieville, Smithville and Wye Mills
    - Oscillatoria: Smithville and Wye Mills
    - Phormidium: Clopper, Unicorn and Wye Mills
- 2019 blooms in Clopper, Hunting, Smithville, Wye Mills.
- 2020 Blooms in Clopper, Hunting Creek, Smithville.

Bloom Level  $>50,000$  cells/ml, *Microcystis*  
 $>100,000$  cell/ml, *total potentially toxic species*

Clopper Lake – scum formed near fishing area.



Smithville Lake – scum formed near dam.



# Algal Toxins Detected

- 2019 toxin found in four out of eight lakes
  - Clopper, Hunting, Smithville, Wye Mills
  - Microcystin 0.81- 2.67 ppb (well below EPA threshold of 8ppb)
  - Nov: 680 ppb in Hunting Creek (drinking water in season)
- 2020 toxin found in three out seven lakes:
  - Clopper, Hunting, Wye Mills
  - Microcystin: 1.9 – 113 ppb
  - Anatoxin below detection limits (Clopper and Hunting Creek)
- Toxin in benthic mats
  - Wye Mills, Unicorn
  - Microcystin 3.2 to 5 ppb
- ‘Animal Safety Alerts’ were issued.
  - 2019: Clopper, Wye Mills, Smithville, Unicorn (hatchery pond)
  - 2020: Clopper, Hunting, Smithville, Unicorn (hatchery pond)
  - Pets, especially dogs, more likely exposed to toxins by drinking the lake water directly and/or licking their coats after swimming in bloom water.
  - Do not let your pets in cyanobacteria blooms!
- NO contact Advisory: Hunting Creek
  - Microcystin 113 ppb

EPA Microcystin Threshold = 8 ppb



# Timeline

The Maryland Department of Natural Resources will hold a webinar November, 2020 and posts information online. Suggestions and comments will be reviewed through the end of the year.

The department will prepare a work plan and budget in 2021 that outlines the projects to be completed with the final \$1 million appropriation.

Third round of funding will be available July 1, 2021.

Projects are projected to end June 30, 2022.

# Questions from the Webinar Registration:



# Open Online Q&A Session:

Please either type your questions/comments or request to unmute the speaker and talk into the microphone



# Submit a Comment!

Are there any issues being overlooked?  
Potential solutions that would help us meet our goals?  
Please provide us with your comments one of two ways:

1. Mail them to us at:

**DNR- Tidewater Ecosystem Assessment  
State Lakes Comment  
580 Taylor Ave. D-2  
Annapolis, MD 21401**

2. Submit your comments by email to:

**Mike Naylor, Natural Resources Biologist  
[mike.naylor@maryland.gov](mailto:mike.naylor@maryland.gov)**

To learn more about the State Lakes Fund, please visit our website at:  
[dnr.maryland.gov/Pages/state-lakes.aspx](http://dnr.maryland.gov/Pages/state-lakes.aspx)