**QUARTERLY PROGRESS MEETING – STAR July 2021**
***Chesapeake Bay Program***

# Brook Trout

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*U.S. Geological Survey*
*Chair, Brook Trout Workgroup*

*Through the* Chesapeake Bay Watershed Agreement*, the Chesapeake Bay Program has committed to…*

# Goal: Vital Habitats

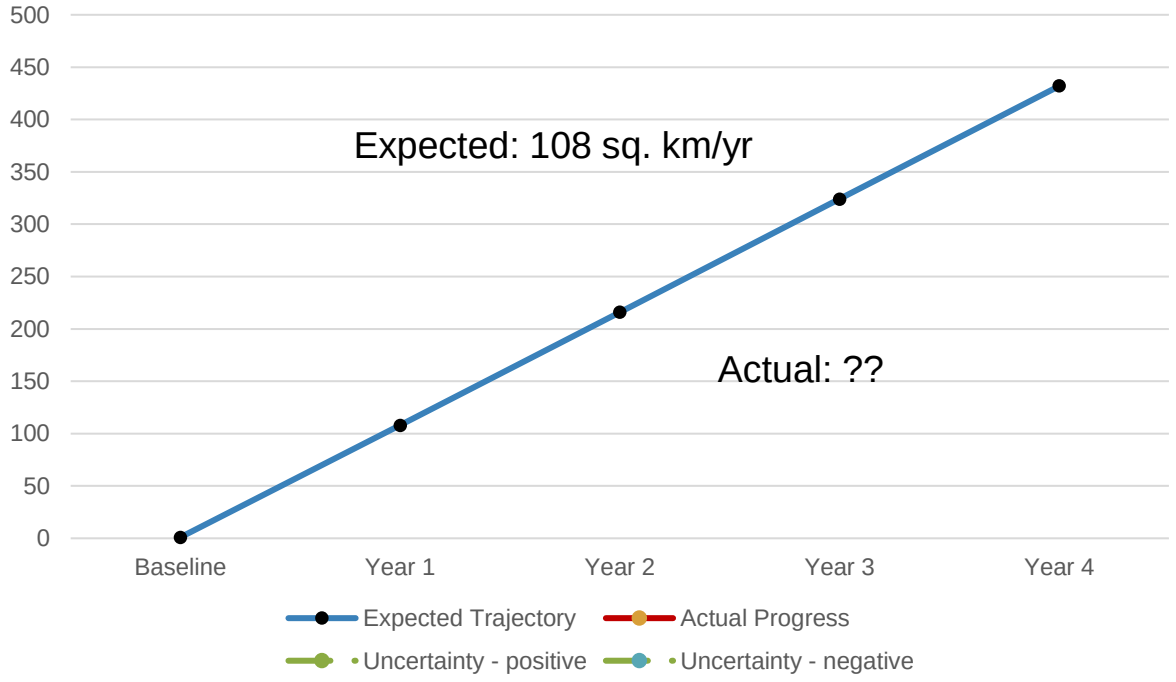
## Outcome: Restore and sustain naturally reproducing brook trout populations in Chesapeake headwater streams with an eight percent increase in occupied habitat by 2025.

## How You Can Help

Summary:

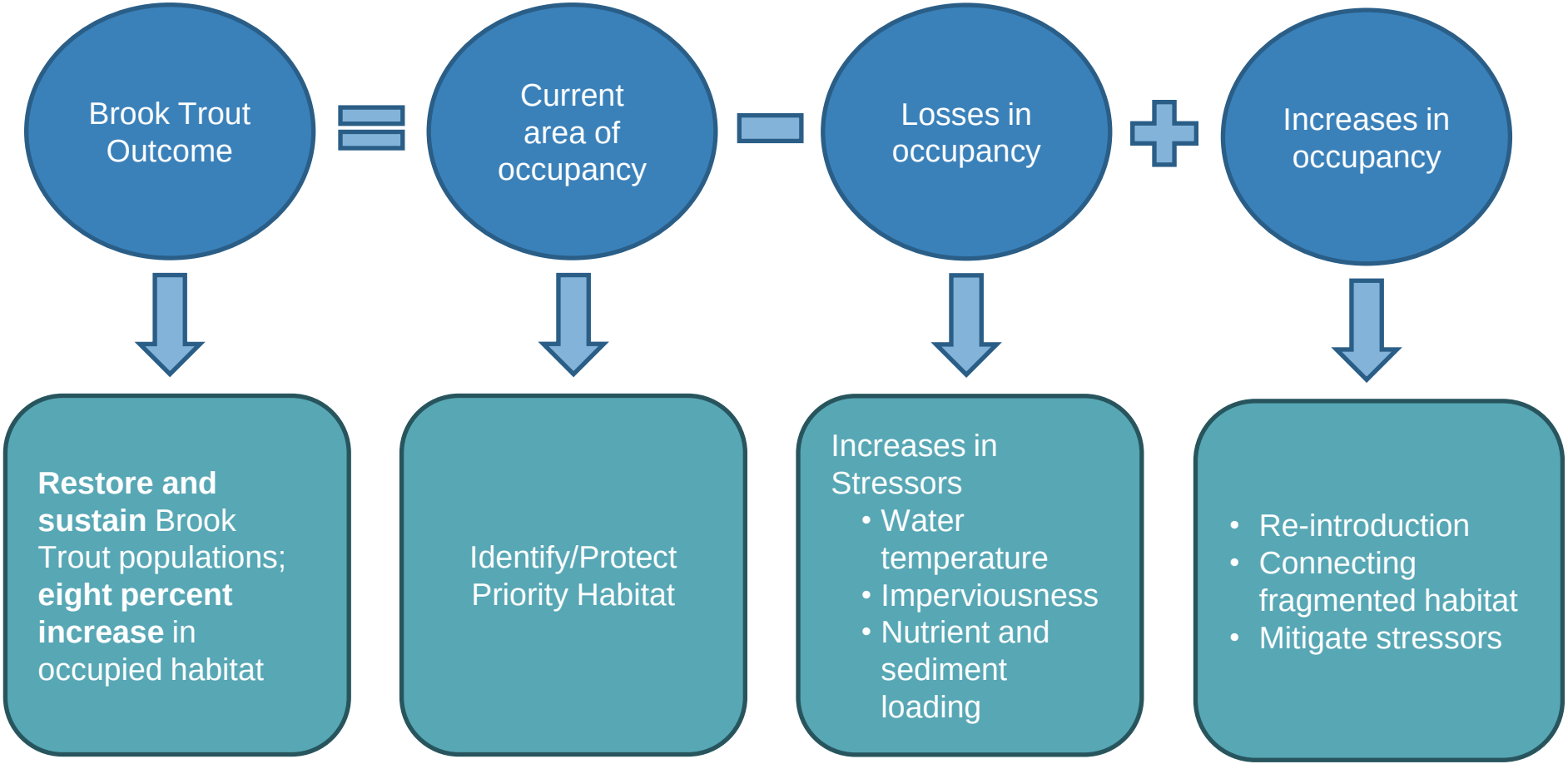
- Not on the track to achieve outcome
- Many successes, but challenges remain
- Need help with addressing primary barriers and coordination

# What is our Expected and Actual Progress?



# Learn

***What have we learned in the last two years?***


Brook Trout Outcome
=
Current area of occupancy
−
Losses in occupancy
+
Increases in occupancy
**Restore and sustain** Brook Trout populations; **eight percent increase** in occupied habitat
Identify/Protect Priority Habitat
Increases in Stressors
• Water temperature
• Imperviousness
• Nutrient and sediment loading
• Re-introduction
• Connecting fragmented habitat
• Mitigate stressors

**Successes and Challenges**

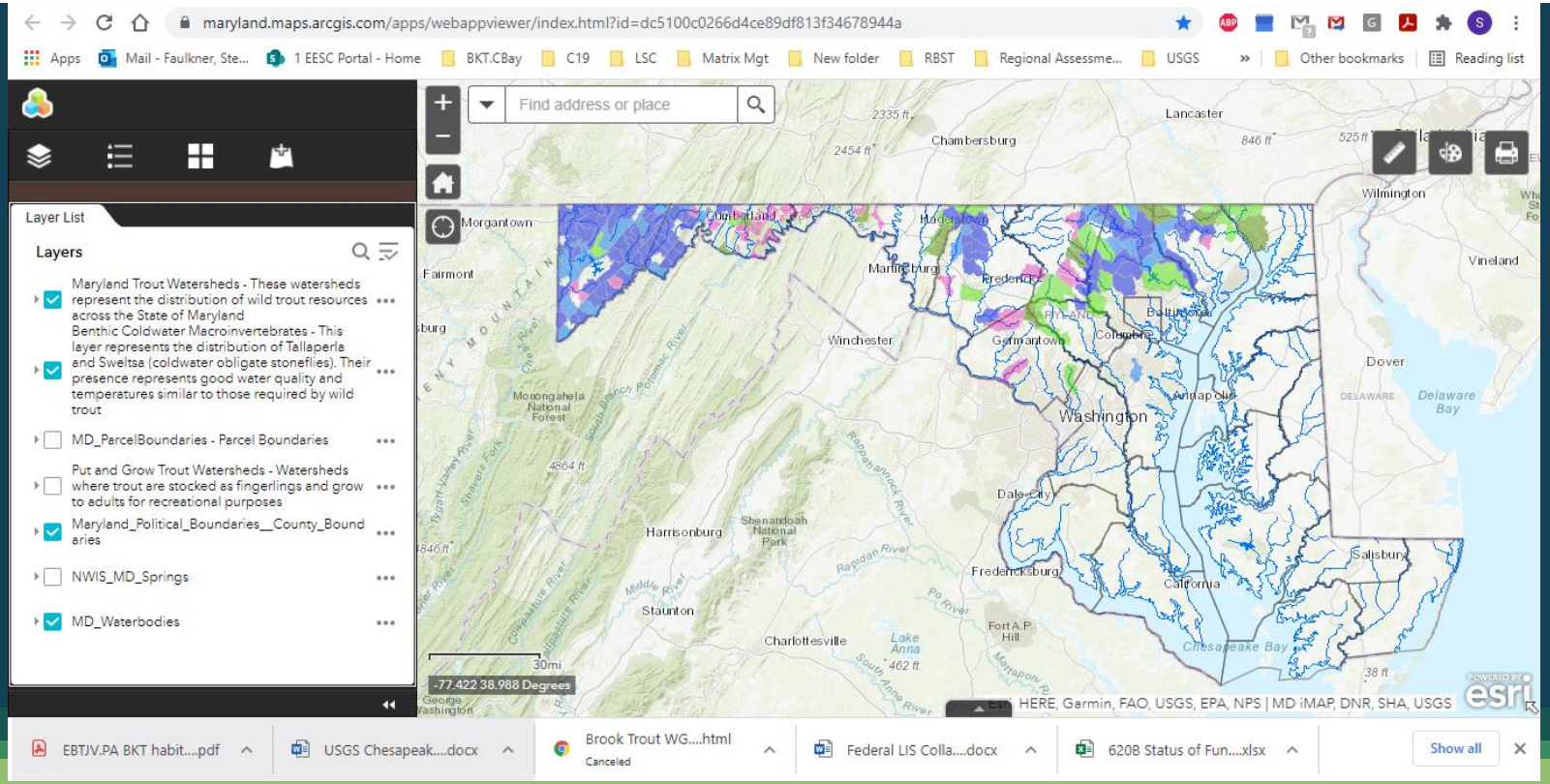
# Science

- Stream water temperature remains the best predictor of brook trout occurrence (multiple models)
- Can’t measure everywhere, so model temperature, evaluate drivers: % Forest/riparian cover, % imperviousness/agriculture, groundwater influence
- Managers need precise information at the appropriate scale to inform decisions - generally highest resolution possible

# Successes

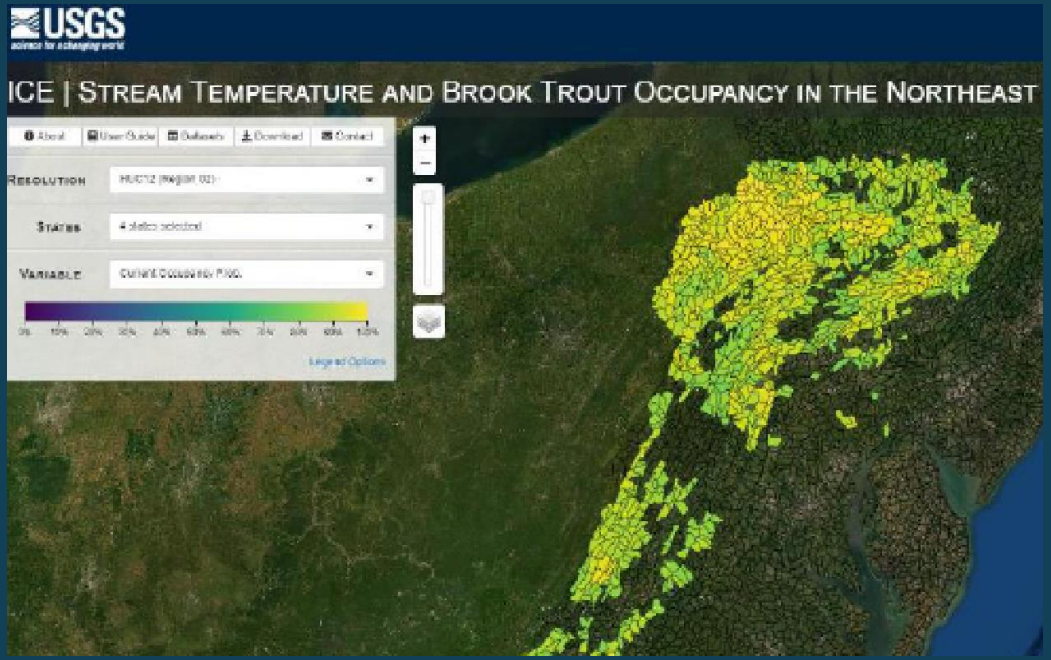
- Accomplished 22 of 28 Action Items
- Developed approach to track all watershed conservation/restoration activities
- Brook trout genetics – publications, STAC workshop
- Groundwater, stream temperatures – publications, new tools, collaborative projects

# MD-DNR Freshwater Fisheries – Coldwater Resources Mapping Tool



# Interactive Catchment Explorer (ICE)

Current >80% Occupancy Probability




+4 $^{0}$C Air Temperature Increase

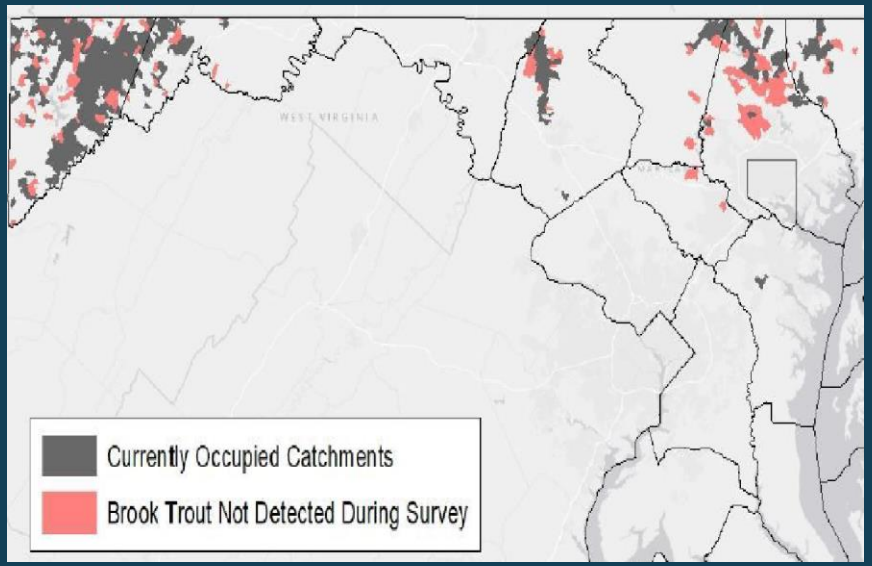

Letcher et al. 2013

# Challenges

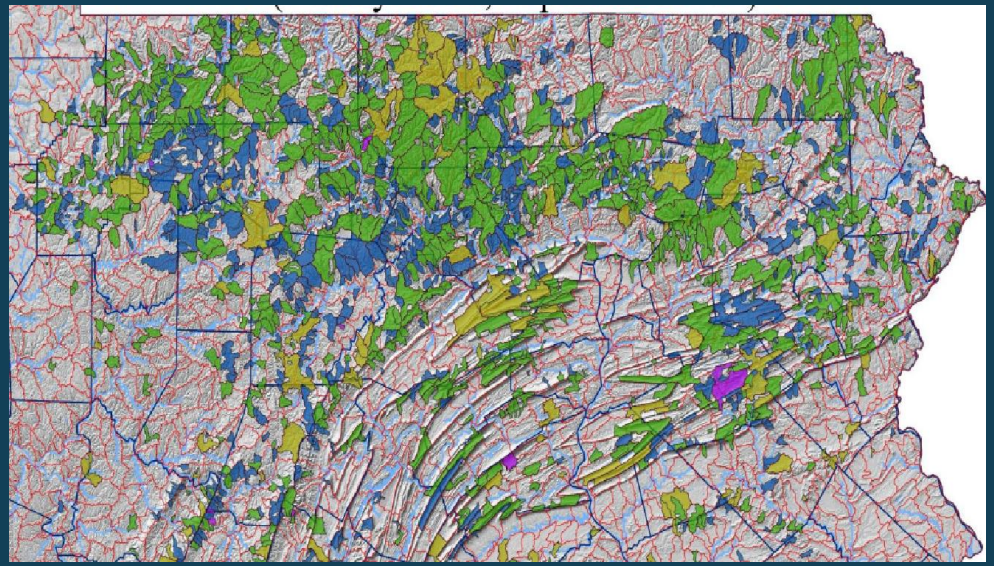
- Some delays due to pandemic
  - STAC Genetics Workshop
  - Developing metrics to quantify conservation actions protecting current brook trout habitat
- No capacity to implement tracking tool for summarizing all watershed restoration activities
- Each state unique, no one-size fits all approach

## Each State Has Individual Circumstances

**MD – 48 sq. km**




**PA – 374 sq. km**



**Different timelines for updating EBTJV Patch Assessment**

# Challenges

- Primary Challenge

  Resources available to the BTWG and associated stakeholders are insufficient to adequately restore and sustain brook trout populations at the scale necessary to overcome the detrimental impacts to brook trout habitat across the watershed.

# On the Horizon

- Understand management implications of new research findings:
  - Brown trout-stream temperature interactions, brown trout removal
  - Outcomes from STAC Genetics and Temperature workshops
  - Effects of climate change, groundwater, BMPs

# On the Horizon

- New legislative actions
  - America Conservation Enhancement (ACE) Act, ChesapeakeWILD
  - Reauthorization of Surface Mining Control and Reclamation Act (funds abandoned mine drainage treatment)
  - MD temperature TMDL

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# Adapt

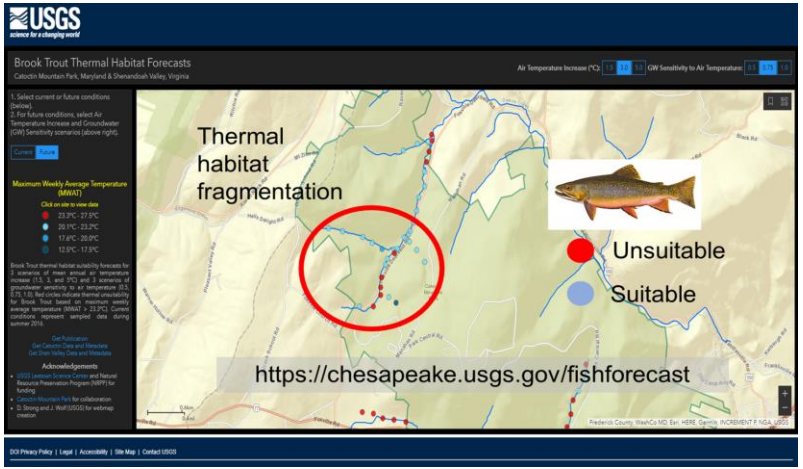
***How does all of this impact our work?***

## Based on what we learned, we plan to …

- Continue to engage BTWG members to identify large-scale priority action items with greatest impact
  - 75% Riparian Forest Cover in all brook trout watersheds
  - Fencing livestock out of brook trout streams
  - Better private landowner engagement/incentives
  - Promote land stewardship

# Based on what we learned, we plan to …

- Work with stakeholders to understand use and application of decision support tools, e.g., Ecosheds Integrated Catchment Explorer (ICE), MD-DNR Coldwater, Thermal Habitat



## Based on what we learned, we plan to …

- Develop additional metrics relevant to brook trout conservation/outcome
- Find resources (GIT proposal) to fund implementation of tracking spreadsheet/tool for all partners (including NGOs) to report progress using common metrics
- Collaborate with other CBP teams (Healthy Watersheds, Fish Passage, Riparian Buffers) on connected actions, e.g., reforestation, aquatic connectivity

# Help

***How can the Management Board lead the Program to adapt?***

# Help Needed

- Work with BTWG to address disconnect between state agency responsibilities/authorities and the actions/decisions made by county/local municipality regarding planning, zoning, that directly affect brook trout habitat

# Help Needed

- Work with Principals/CBP to increase resources (staff, projects, monitoring) to address the primary barriers unique to each state
    - 75% Riparian Forest Cover in all brook trout watersheds (MD - $50M)

# Discussion