

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



# Brook Trout

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

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



Goal: Vital Habitats - Restore, enhance and protect **a network of land and water** habitats to support fish and wildlife

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

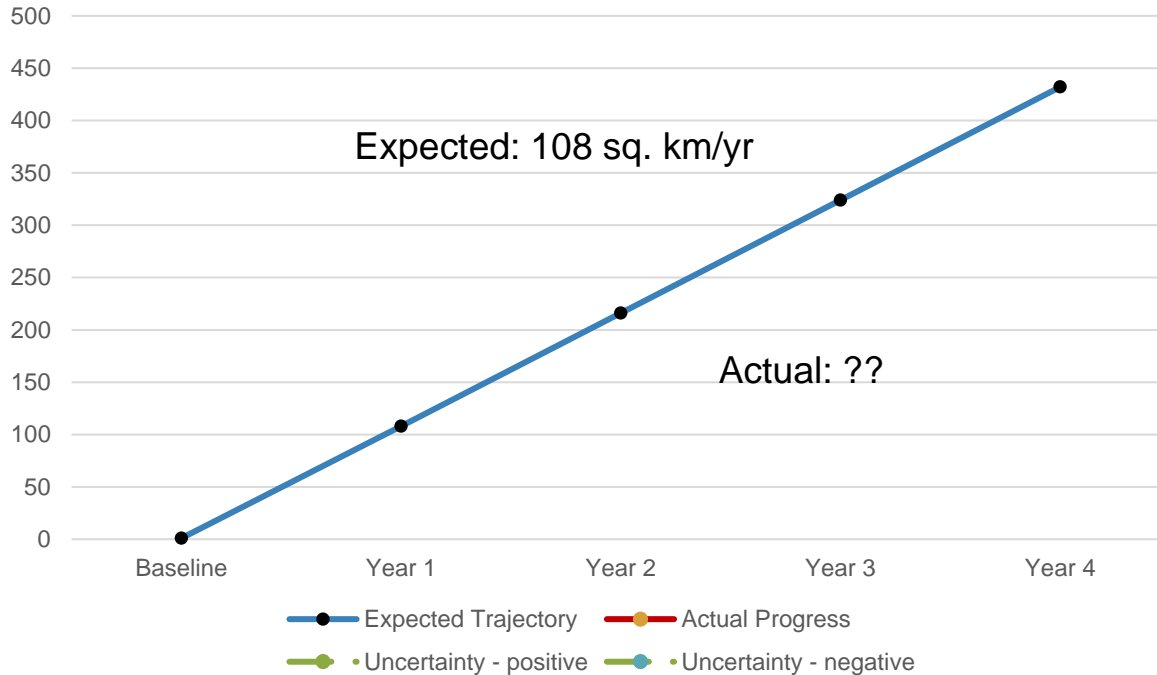


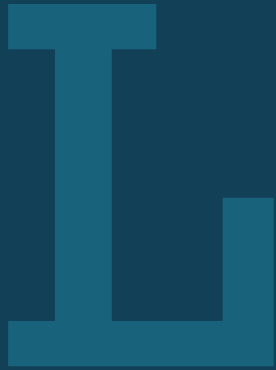
### Summary:

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



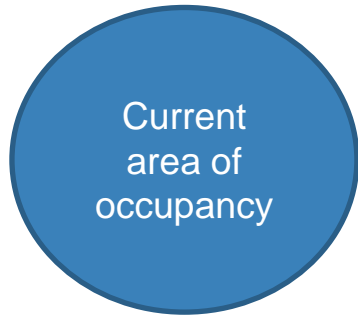
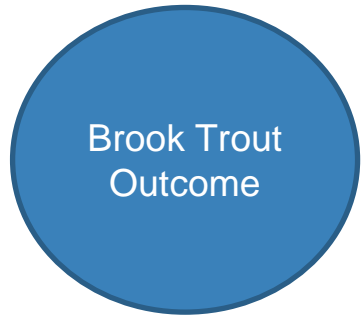
## What is our Expected and Actual Progress?





# Learn

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



**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 and Challenges

# Science

- EO 13508 – Brook Trout are one of the four indicator species “because they reflect the habitat health and hold great ecological, commercial and recreational significance”
- While challenging, these large-scale priority action items outlined here are urgently needed and will also address barriers affecting other Outcomes as they are intrinsically connected to Healthy Watersheds, Fish Passage, Forest Buffers, and Protected Lands through hydrological and ecological processes





## 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

The screenshot displays a web browser window with the URL [maryland.maps.arcgis.com/apps/webappviewer/index.html?id=dc5100c266d4ce89df813f34678944a](http://maryland.maps.arcgis.com/apps/webappviewer/index.html?id=dc5100c266d4ce89df813f34678944a). The browser's address bar and bookmarks are visible at the top. The main content area shows a map of Maryland with various layers overlaid. A search bar at the top left of the map interface contains the text "Find address or place".

The **Layer List** on the left side of the map includes the following layers:

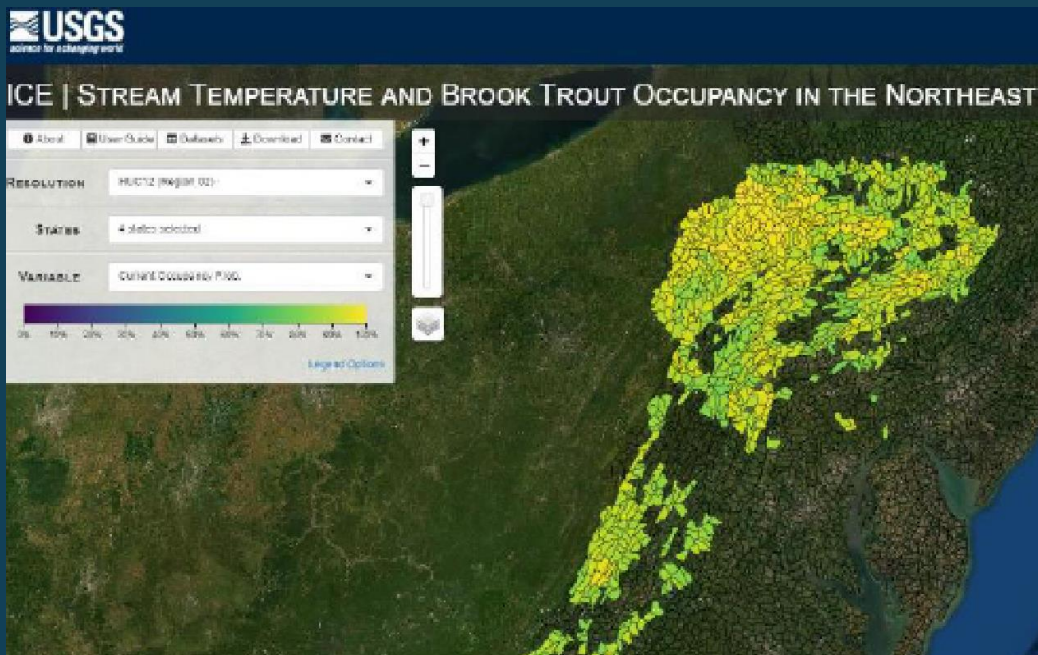
- Maryland Trout Watersheds - These watersheds represent the distribution of wild trout resources across the State of Maryland
- Benthic Coldwater Macroinvertebrates - This layer represents the distribution of Tallaperla and Sweltsa (coldwater obligate stoneflies). Their presence represents good water quality and temperatures similar to those required by wild trout
- MD\_ParcelBoundaries - Parcel Boundaries
- Put and Grow Trout Watersheds - Watersheds where trout are stocked as fingerlings and grow to adults for recreational purposes
- Maryland\_Political\_Boundaries\_\_County\_Boundaries
- NWIS\_MD\_Springs
- MD\_Waterbodies

The map shows the state of Maryland with various geographical features, including the Potomac River, Chesapeake Bay, and several cities like Washington, Baltimore, and Annapolis. The map is powered by Esri and includes a scale bar and a coordinate display at the bottom left showing  $-77.42238988$  Degrees.

At the bottom of the browser window, several open tabs are visible, including "EBTV.PA BKT habit...pdf", "USGS Chesapeak...docx", "Brook Trout WG...html", "Federal LIS Colla...docx", and "620B Status of Fun...xlsx".

Current >80% Occupancy Probability

+4 °C Air Temperature Increase





## Challenges

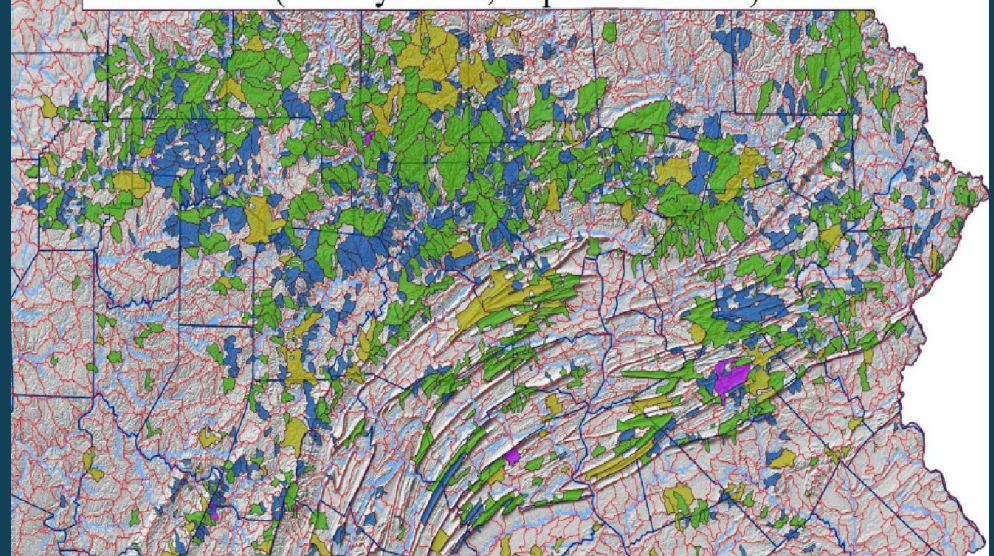
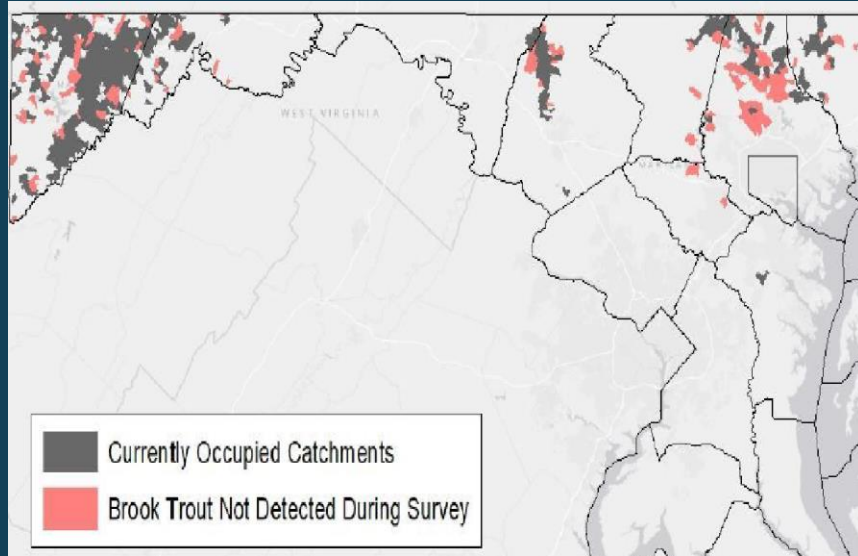
- Some delays due to pandemic
  - STAC Genetics Workshop
  - Developing metrics to quantify conservation actions protecting current brook trout habitat
- No capacity to implement tracking tool for summarizing all watershed restoration activities
- Each state unique, no one-size fits all approach



## 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.



## Challenges

While the connection of brook trout to Healthy Watersheds, Fish Passage, Forest Buffers, and Protected Lands through common hydrological and ecological processes are recognized, the BTWG lacks the capacity to implement or coordinate actions at the scale necessary to overcome the detrimental impacts and achieve the Outcome



## 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

A large, stylized, blue letter 'A' is centered on a dark blue background. The letter has a thick, blocky font with a slight shadow effect. The background is divided into horizontal bands of color: a dark blue band at the top, a medium blue band in the middle, and a light green band at the bottom.

# Adapt

*How does all of this impact our work?*



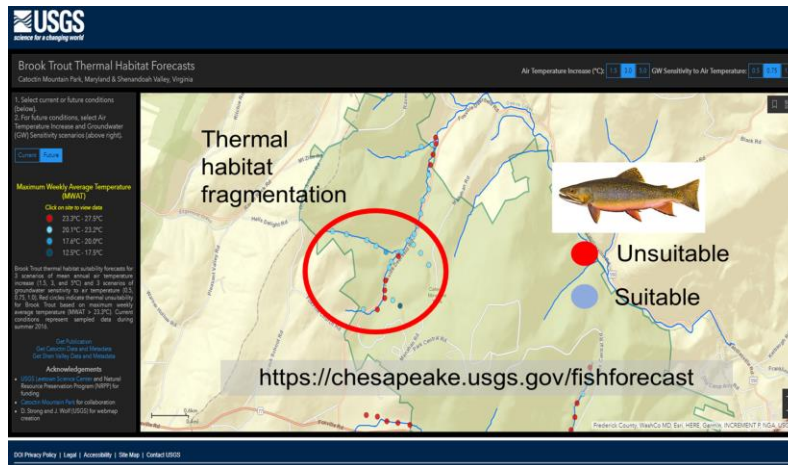
## Based on what we learned, we plan to ...

- 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 the BTWG and the appropriate agencies and organizations to increase efforts to implement the large-scale priority action items with the greatest impact



## Help Needed

- This includes providing CBP staff support to better coordinate with other CBP GITs on connected actions (e.g., reforestation, aquatic connectivity, eDNA monitoring) that address multiple Outcomes



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# Discussion