Brook Trout

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Workgroup
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.
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?

Expected Trajectory:
- Expected: 108 sq. km/yr

Actual Progress:
- Actual: ??

Baseline Year 1 Year 2 Year 3 Year 4
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**
Successfully and Challenges

- 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.
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
Interactive Catchment Explorer (ICE)

Current >80% Occupancy Probability

+4 °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.
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
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.

[Image: Map showing thermal habitat fragmentation with URL: https://chesapeake.usgs.gov/fishforecast]
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?
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
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.
Discussion