QUARTERLY PROGRESS MEETING – July 2019
Chesapeake Bay Program

Brook Trout

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

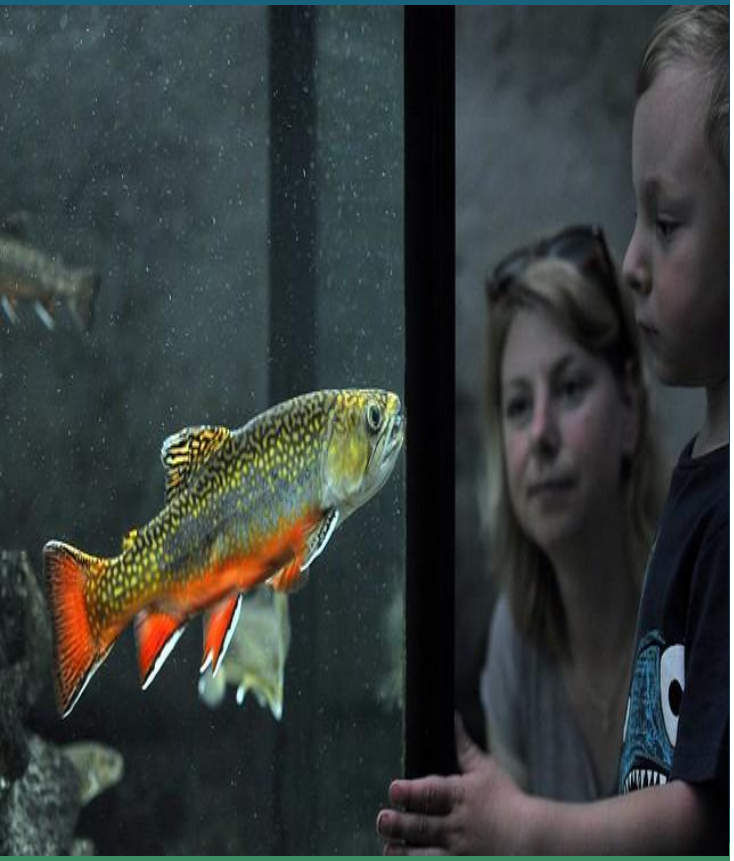
Goal: Vital Habitats

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

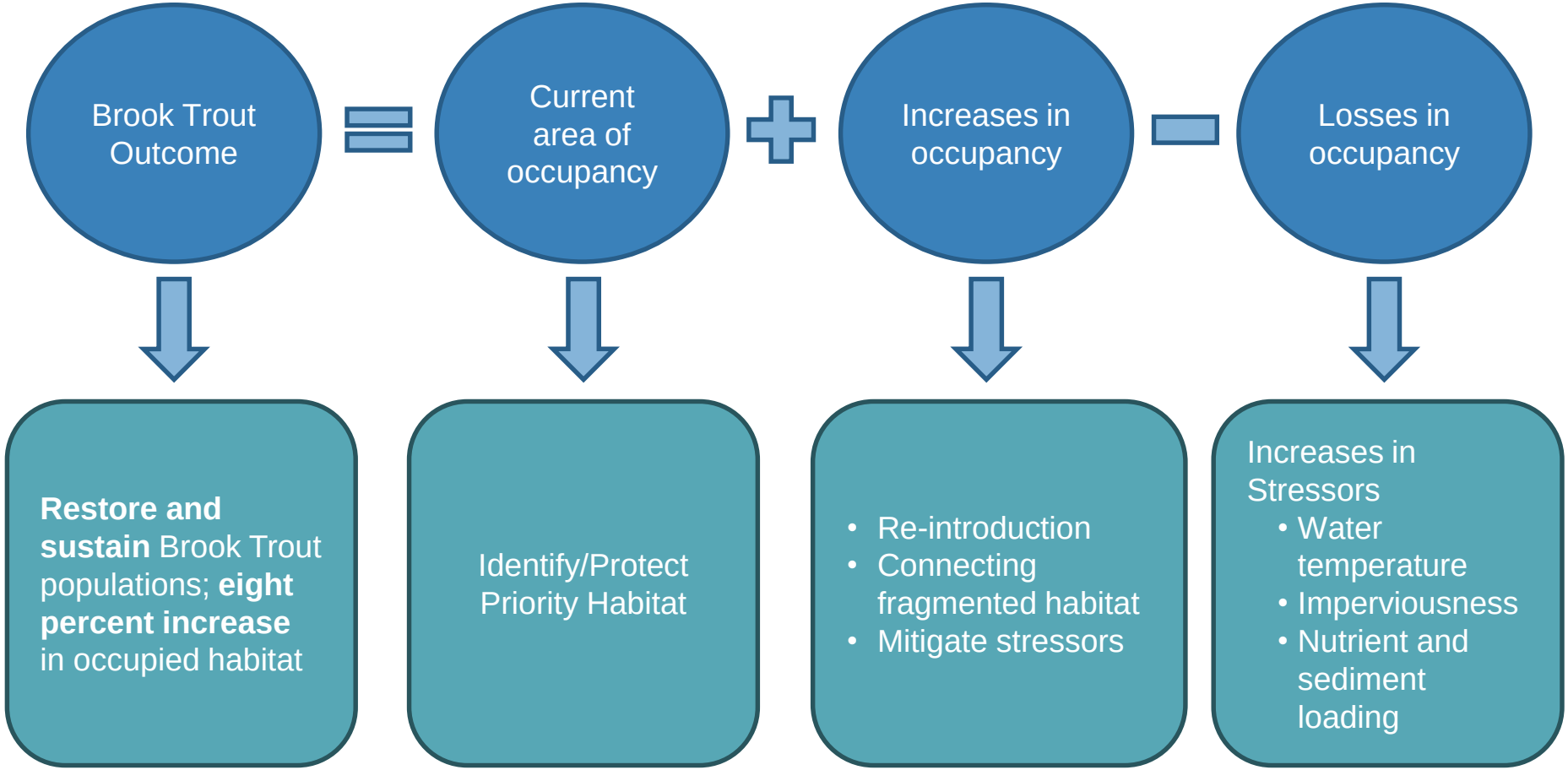
Summary:

- Likely not on the track, but looking for it.
- Both scientific and programmatic challenges remain.
- Need help with outreach, communication, and coordination.



Learn

What have we learned in the last two years?


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

Successes and Challenges

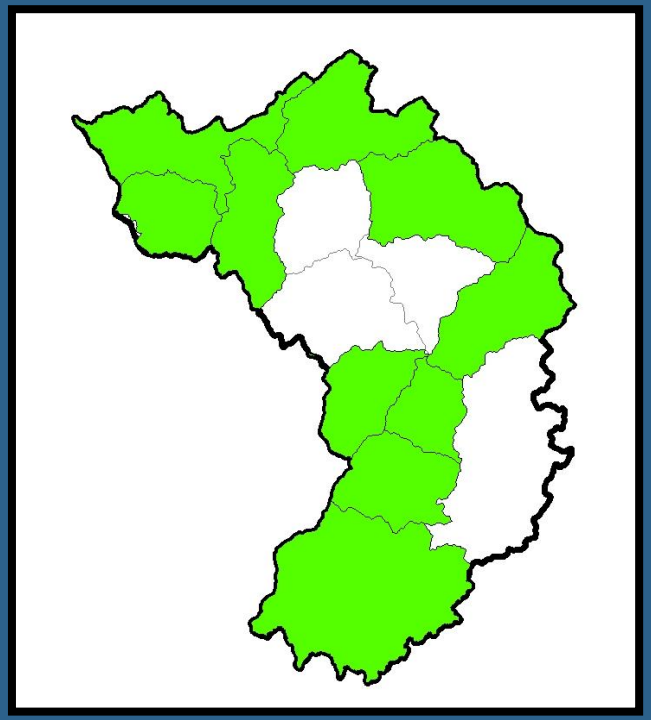
Science

- 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 upwelling
- Need information at decision-relevant scales, generally highest resolution possible

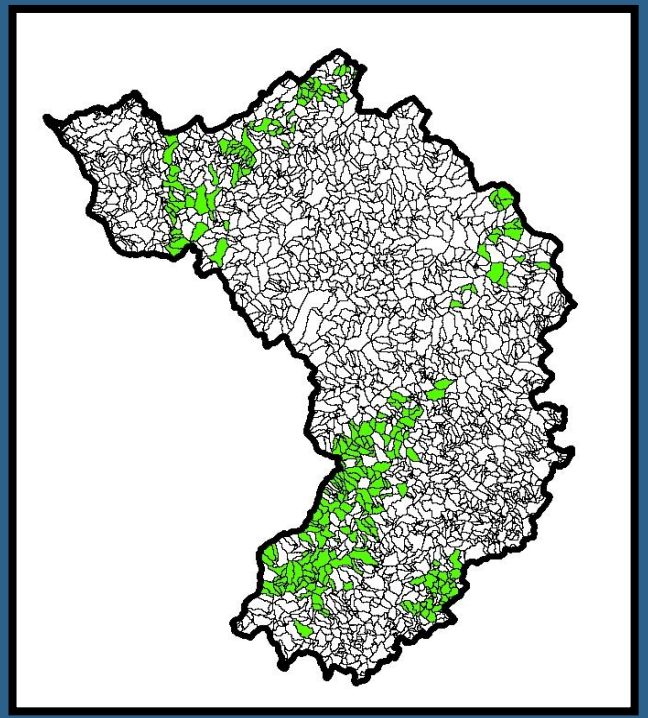
Scale Effects

Brook Trout Occupancy

Watershed (HUC10): 76% of watersheds



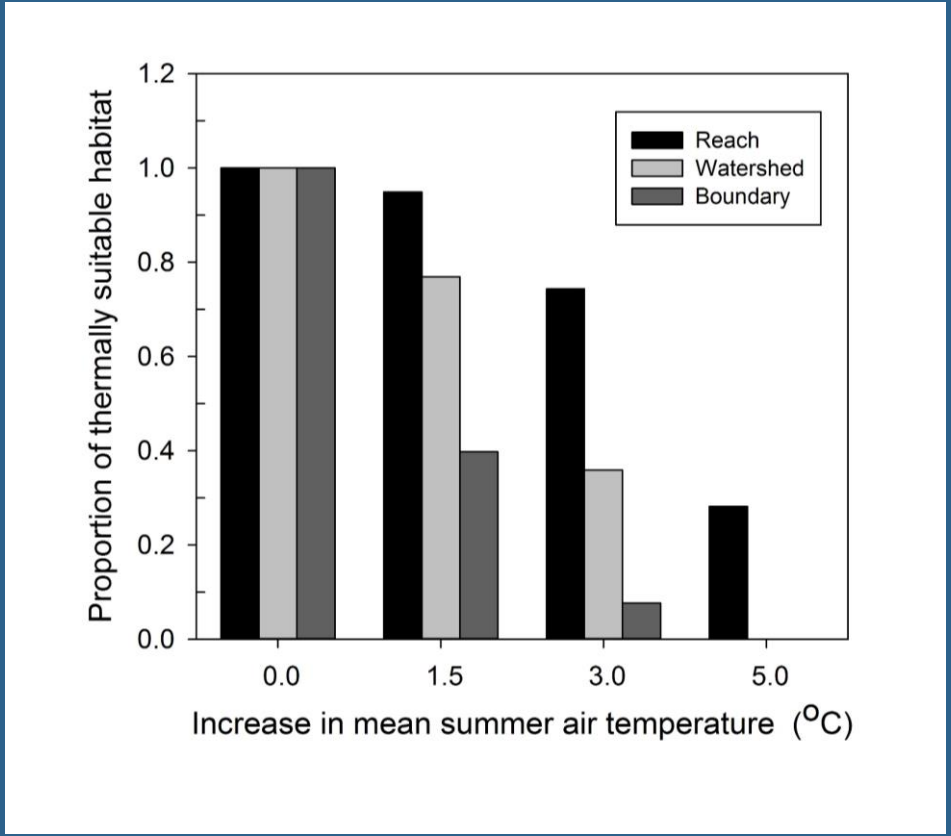
Catchments (HUC14): 11% of catchments



Adapted from Hudy et al. 2013

Scale Effects

Brook Trout Habitat



From Snyder et al. 2015

Successes and Challenges

Program

- Full implementation of work plan actions hampered by limited resources, personnel
- Most successful actions are those most closely aligned with state/federal agencies, NGOs program priorities
- Work on priority components (e.g., genetics, metrics, reporting tool) is moving forward, but slowly

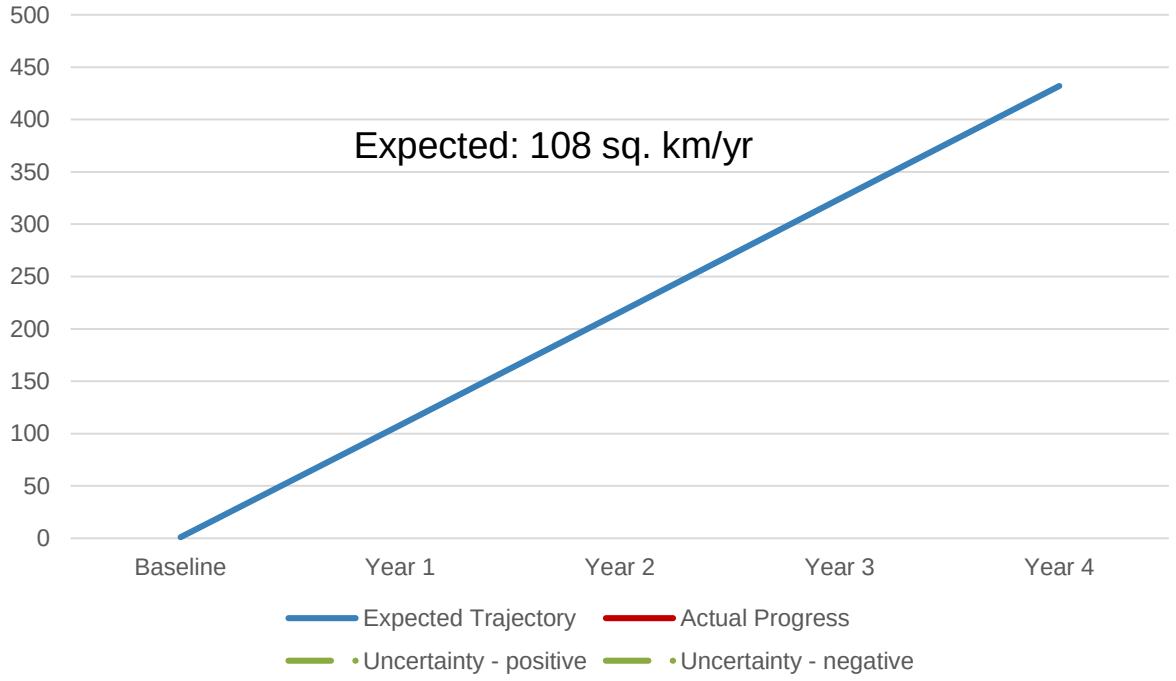
Successes and Challenges

Program

- Limited success with cross-GIT collaborations, engagement with CBP teams related to identifying/communicating with local decision makers, co-benefits.

- Need to develop additional metrics to quantify conservation actions that substantially contribute to maintaining current brook trout habitat – equally important as restoration

What is our Expected and Actual Progress?



On the Horizon

- New research findings related to genetics, restoration methodologies, impacts of climate, land-use change.
- Results of new fine-scaled fish habitat assessment
- Activities related to healthy watersheds, fish passage, aquatic connectivity efforts

A

Adapt

How does all of this impact our work?

Based on what we learned, we plan to …

- Continue to engage BTAT members/NGOs to identify priority action items with greatest impact, knowledge gaps
- Develop additional metrics related to conservation/protection of existing high quality brook trout habitat

Based on what we learned, we plan to …

- Continue to address science needs related to climate impacts, genetics, habitat assessment
- Work with BTAT/CBP staff to develop tracking spreadsheet/tool for all partners (including NGOs) to report progress using common metrics.

Help

How can the Management Board lead the Program to adapt?

Help Needed

- CBP/other staff support to help develop communication/outreach plan, identify key decision-makers

- If we can't get the best available science to the right decision makers, then our ability to increase brook trout habitat and occupancy is limited.

Help Needed

- CBP staff support to help develop and maintain tracking spreadsheet/tool
- MB help to address insufficient monitoring data to adequately track progress towards outcome
- MB help to address insufficient support for full participation of BTAT members

Discussion

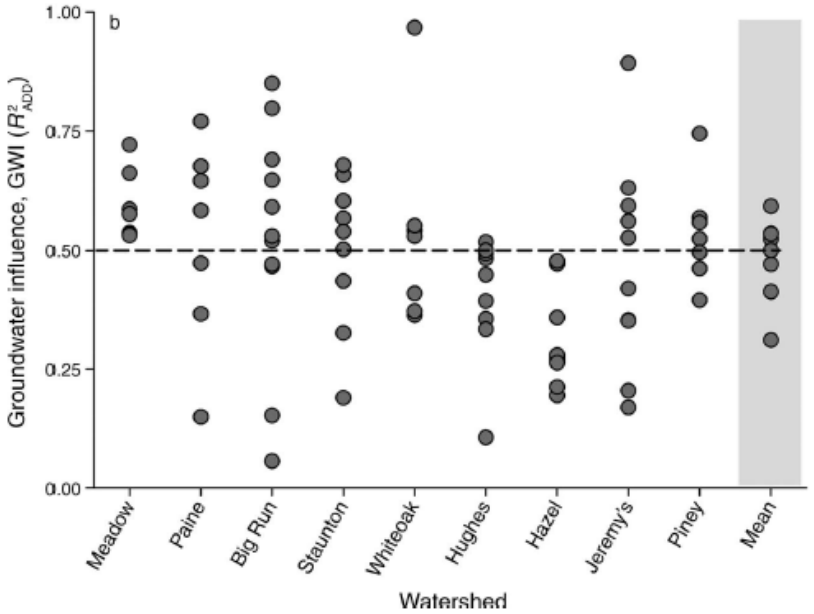
Additional Science Needs

Brook Trout Genetics-Related Management Questions

- Select donor populations for restoring Brook Trout in waters where they once existed
  - What metrics should be used to evaluate and prioritize potential source stocks?
- Assess Brook Trout population responses to the removal of a barrier
- Determine if a Brook Trout population is close to "winking out"
- Assess and manage Brook Trout effective population size/effective number of breeders
- Establish critical Brook Trout population effective sizes for evolutionary potential
- Prioritize Brook Trout populations for conservation
  - Provide justification for establishing habitat protections. Can genetic analysis be used to identify priority or important habitats for population sustainability and resilience?
- Monitor Brook Trout population trends
- Determine potential range of population size structure and growth among strains or populations
- Determine of a Brook Trout population's fitness (sustainability)
  - Can we effectively assess "fitness" or should fitness be determined by natural selection and time
  - . . . . . .

Additional Science Needs

Fine-scale groundwater influence on stream temperature



From Snyder et al. 2015