Brook Trout Logic Table and Work Plan (2018-2019)

Long-term Target: (the metric for success of Outcome): Restore and sustain naturally reproducing brook trout populations in Chesapeake headwater streams with an eight percent increase in occupied habitat by 2025.

Two-year Target: (increment of metric for success): 137 km2 of restored brook trout habitat per year.

Factor	Current Efforts	Gap	Actions (critical actions in bold)	Metrics	Expected Response and Application	Learn/Adapt
What is impacting our ability to achieve our outcome?	*What current efforts are addressing this factor?*	*What further efforts or information are needed to fully address this factor?*	*What actions are essential to achieve our outcome?*	*Optional: Do we have a measure of progress? How do we know if we have achieved the intended result?*	*Optional: What effects do we expect to see as a result of this action, when, and what is the anticipated application of these changes?*	*Optional: What did we learn from taking this action? How will lesson this impact our work?*
Scientific and Technical Understanding: Climate Change	*USGS, NPS, USFS, and academic institutions have active research programs.*	*Better understanding of population genetics, functional genomics, acid mine drainage, and spatially explicit linkages between brook trout populations and stressors is needed to inform conservation decisions and decision support tools.*	2.1	Develop a spatially explicit dataset of AMD-impacted streams suitable for restoration/conservation actions; Genetics white paper.	Improved decision support tools that account for how climate change and other stressors interact; improved conservation decisions that consider adaptive potential of brook trout populations and location of vulnerable habitats.	
Scientific and Technical Understanding: Habitat Stressors			2.2			
Scientific and Technical Understanding: Monitoring	*State and NGO partners are conducting annual monitoring of brook trout streams.*	*Funding; data and analyses to correlate habitat restoration to improvements in brook trout populations; develop annual occupancy reporting process.*	4.1	Tracking spreadsheet developed and updated; eDNA report.	Analysis and tracking of monitoring results will provide quantitative data to evaluate progress on outcome and help identify at-risk populations.	
			4.2			
Partner Coordination: Monitoring			4.3			
Scientific and Technical Understanding: Refinement and	*USGS, NPS, USFS, NGO's and academic institutions have*	*Decision support tool coordination and training for practitioners in order to best*	2.1	DST workshop planned/held; Genetics webinar held; AMD	Better understanding of how DSTs and genetics work/can be applied will improve	
			2.2			

Factor	Current Efforts	Gap	Actions (critical actions in bold)	Metrics	Expected Response and Application	Learn/Adapt
coordination of use of decision support tools	*active research programs that will help refine DSTs.*	*guide restoration efforts; refinement of available tools.*		spatially explicit dataset developed.	conservation and restoration decisions.	
Partner Coordination: Refinement and coordination of use of decision support tools			3.1			
Scientific and Technical Understanding: Restoration	*USGS, NPS, USFS, NGO's and academic institutions have active research programs.*	*Decision support tool coordination and refinement in order to best guide restoration efforts.*	2.1 2.2	Develop a spatially explicit dataset of AMD-impacted streams suitable for restoration/conservation actions; improved understanding of vulnerable brook trout populations; Genetics white paper.	Better understanding of both environmental and genetic factors affecting brook trout habitat and populations will improve restoration decisions.	
Government Agency Engagement: Decision-maker and public awareness of brook trout issues	*CBP created co-benefit templates to inform WIP developers; "Best of the Best" fact sheets being created by BTAT.*	*Communication strategy and products to educate and engage the public and decision makers on priority brook trout habitat for conservation.*	1.1 1.2 1.3	Collaborative meetings with Communications Team; outreach strategy; White paper; database of communication products.	Improved understanding of environmental factors affecting brook trout habitat and populations and location of high quality brook trout streams by local decision makers will lead to better land-use decisions and reduce stressors.	
	"Best of the Best" fact sheets being created by BTAT.	*Government agency awareness of brook trout*	1.1	Webinar and workshop held; outreach strategy;	Improved understanding of environmental factors	

Factor	Current Efforts	Gap	Actions (critical actions in bold)	Metrics	Expected Response and Application	Learn/Adapt
Government Agency Engagement: Habitat Protection		*habitat/needs, engagement with decision support tools designed to inform habitat conservation activities.*	3.1	collaborative meetings with Communications Team.	affecting brook trout habitat and populations and location of high quality brook trout streams by local decision makers will lead to better land-use decisions and reduce stressors.	
Partner Coordination: Coordination with restoration groups to target opportunities to increase habitat and presence	*Trout Unlimited Home Rivers Initiative (restoration); various state efforts.*	*Better coordination among state, NGO, and BTAT partner engagement in brook trout restoration/monitoring efforts.*	4.3 / 4.5	Identify key points of contact and maintain regular communication/engagement.	Better coordination and communication will help identify restoration opportunities and reporting.	

KEY: Use the following colors to indicate whether a Metric and Expected Response have been identified.	
Metric	Specific metrics have not been identified
	Metrics have been identified
Expected Response	No timeline for progress for this action has been specified
	Timeline has been specified

WORK PLAN ACTIONS

Green – action has been completed or is moving forward as planned   **Yellow** – action has encountered minor obstacles   **Red** – action has not been taken or has encountered a serious barrier

Action	Description	Performance Target(s)	Responsible Party & Geographic Location	Metrics	Expected Timeline
Management Approach 1: Identify and Communicate Priority Focal Areas for Brook Trout Conservation					
1.1	Communicate "best of the best" patches in context of local conservation planning.	a. Develop outreach/communication strategy for delivering "Best of the Best" template handout to local decision makers.	BTAT, CBP Communications Team, Local Government Advisory Committee.	Collaborative meetings with Communications Team; outreach strategy	June 2018

		b. Identify relevant decision-makers at the state and local level.			
1.2	Develop cache of outreach/communication products for quick response to requests.	a. Develop white paper synthesizing state of current knowledge (beneficial/harmful BMP's, economic benefits, co-benefits).	BTAT, EBTJV, State partners, NGO partners.	White paper; database of communication products.	December 2018
		b. Develop a coldwater education tool for presenting to state and municipal government environmental regulatory and permitting agencies to inform and educate as to needs and life history requirements of trout.			
1.3	Collaborate with other Action Teams on communication strategies and products.	a. Meet and coordinate with other Action Teams.	BTAT, CBP Workgroups, CBP Communications Team, LGAC.	Communication strategy and collaborative product(s).	September 2018
Management Approach 2: Consider Climate Change and Emerging Stressors in Determining Restoration Priorities					
2.1	Consider acid mine drainage-impacted streams and unconventional oil and gas development.	a. Obtain and summarize AMD data from states for prioritization tool inclusion.	BTAT, EBTJV, State partners, CBP GIS team.	Develop a spatially explicit dataset of AMD-impacted streams suitable for restoration/conservation actions.	February 2019
		b. Review current AMD impacted streams in western Maryland and develop a list of streams (if any) to consider and evaluate for potential brook trout reintroduction.			
2.2	Consider the impacts of trout population genetics on restoration/conservation decisions.	a. Work with partners to include genetic information to spatially explicit DSTs, e.g., Conservation Portfolio Planning tool.	BTAT, EBTJV, State partner, TU.	Identify barriers to incorporating genetic information; approach to overcoming barriers.	February 2019
		b. Develop introductory genetics white paper.	BTAT, EBTJV, State partners, NGO partners.	Genetics white paper.	September 2018
Management Approach 3: Refine and Apply Decision Support Tools					
3.1	Inform conservation decision making using available Brook Trout Decision Support Tools.	a. Hold genetics workshop/webinar on available genetic tools (eDNA, etc.).	BTAT, EBTJV, State partners, NGO partners.	Genetics webinar/workshop held.	December 2018
		b. Hold DST Workshop to inform participants on the various aspects of the available brook trout-related decision support tools.	BTAT, EBTJV, State partners, NGO partners, CBP.	DST workshop planned/held.	December 2018
Management Approach 4: Continue and Expand Brook Trout monitoring efforts					

4.1	Explore monitoring Brook Trout using eDNA as a cost saving measure.	a. Evaluate eDNA approaches to develop methodology/protocols, determine costs, etc.	BTAT, EBTJV, State partners, NGO partners.	eDNA report.	June 2018
		b. Develop eDNA GIT project proposal with Fish Passage Workgroup.	BTAT, Fish Passage Workgroup.	GIT Funding Project proposal submitted.	
4.2	Streamline progress reporting process for Partners.	a. Canvass EBTJV, State, and NGO representatives with regard to obstacles to reporting progress/restoration tracking, possible solutions.	BTAT, CBP Staff.	Report on obstacles and solutions to improved partner project tracking.	June 2018
		b. Develop and maintain a tracking spreadsheet for all partners (including NGOs) to report on their work using the same attributes/language.		Tracking spreadsheet developed and updated.	February 2019
4.3	Track progress of partner specific activities.	a. PA – Brook Trout were reintroduced into Limestone Run in central Pennsylvania during 2016 and 2017. This project will be monitored in 2018 to determine if additional brook trout are needed.	Pennsylvania FBC.	Partner progress tracked; restoration project type, expected success.	February 2019
		b. MD – Complete 5-year statewide brook trout census of historically known/suspected/predicted brook trout populations.	Maryland DNR.	Partner progress tracked; restoration project type, expected success.	February 2019
		c. MD – Continue statewide brook trout genetics survey and analysis in the Upper Savage River watershed and Big Pipe Creek.	Maryland DNR.	Partner progress tracked; restoration project type, expected success.	February 2019
		d. VA – Quantitative monitoring of North River, St. Mary's River, Little Stony Creek, and others.	VA Dept. of Game and Inland Fisheries.	Partner progress tracked; restoration project type, expected success.	February 2019
		e. VA – collect genetic samples from recently established brook trout populations to determine genetic composition/health	VA Dept. of Game and Inland Fisheries.	Partner progress tracked; restoration project type, expected success.	February 2019

		f. VA – Continue long-term stream temperature monitoring from several wild brook trout streams.	VA Dept. of Game and Inland Fisheries.	Partner progress tracked; restoration project type, expected success.	February 2019
4.4	Review and refine Brook Trout guiding documents with new restoration/monitoring knowledge.	a. Management Strategy will be reviewed and updated if necessary.	BTAT.	Management Strategy reviewed, possibly updated.	2019
4.5	Improve monitoring of restoration activities and existing populations.	a. Help coordinate efforts among partners to incorporate new information into monitoring and restoration programs and identify funding opportunities.	BTAT, EBTJV, State partners, NGO partners.	Projects to address gaps for specific factors are identified and accomplished; gaps are targeted by funding opportunities, e.g., NFWF.	February 2019