

Why do we care about Brook Trout?

- Only native trout species in Maryland
- Indicator species for coldwater, pristine habitats



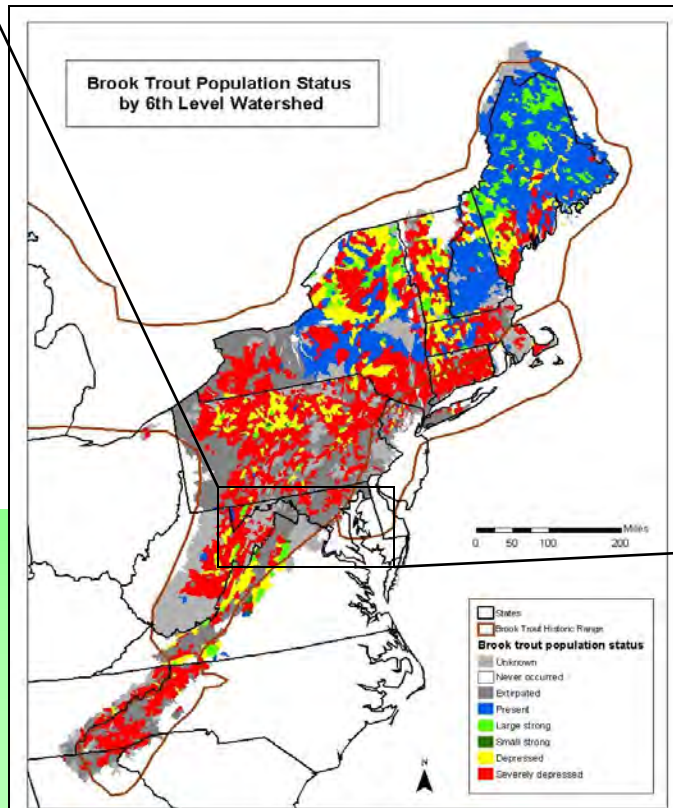
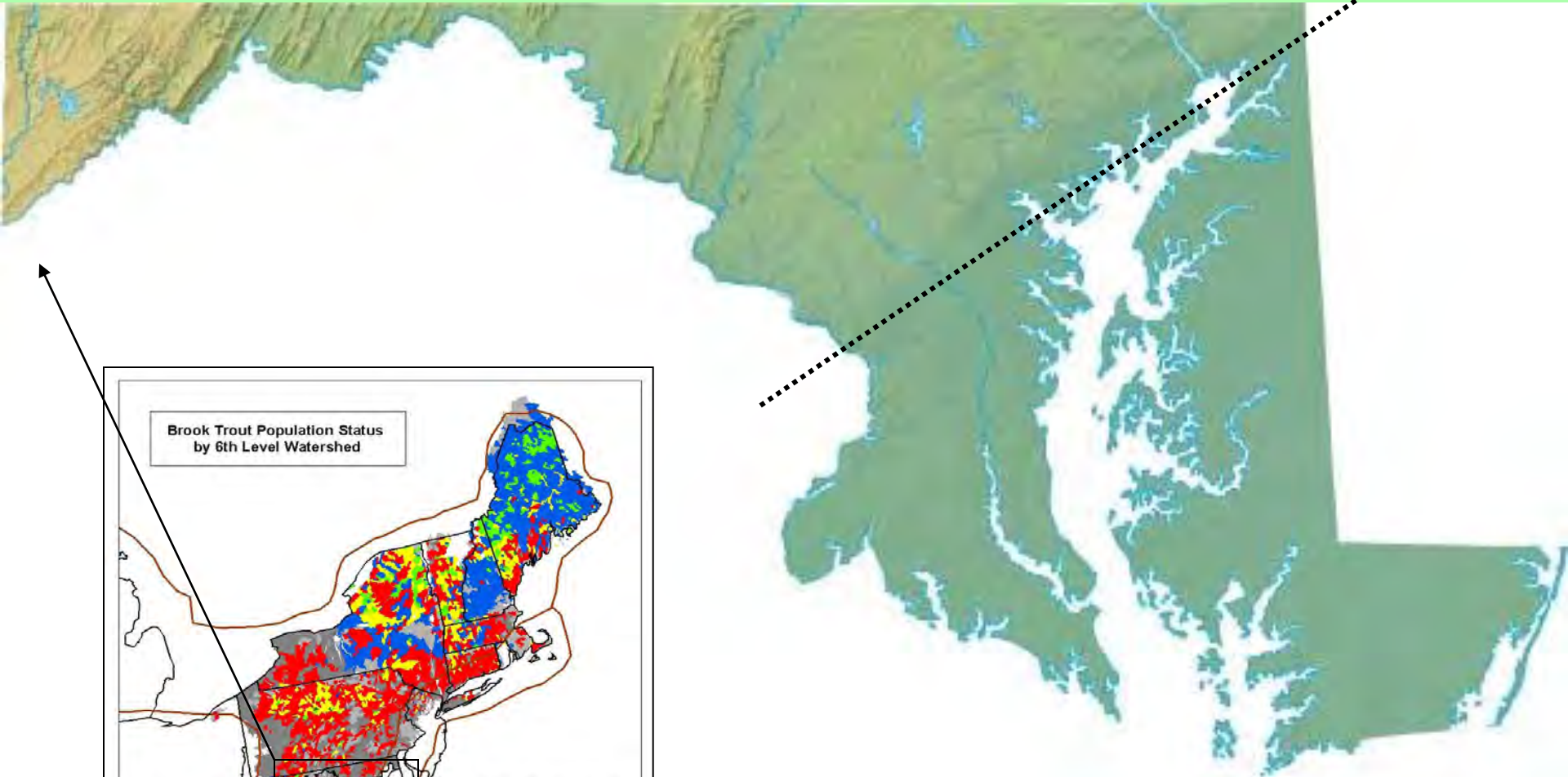
- Recreationally valuable, historic and current
- Areas where found aesthetically pleasing
- Economic value

Brook Trout Life History Needs

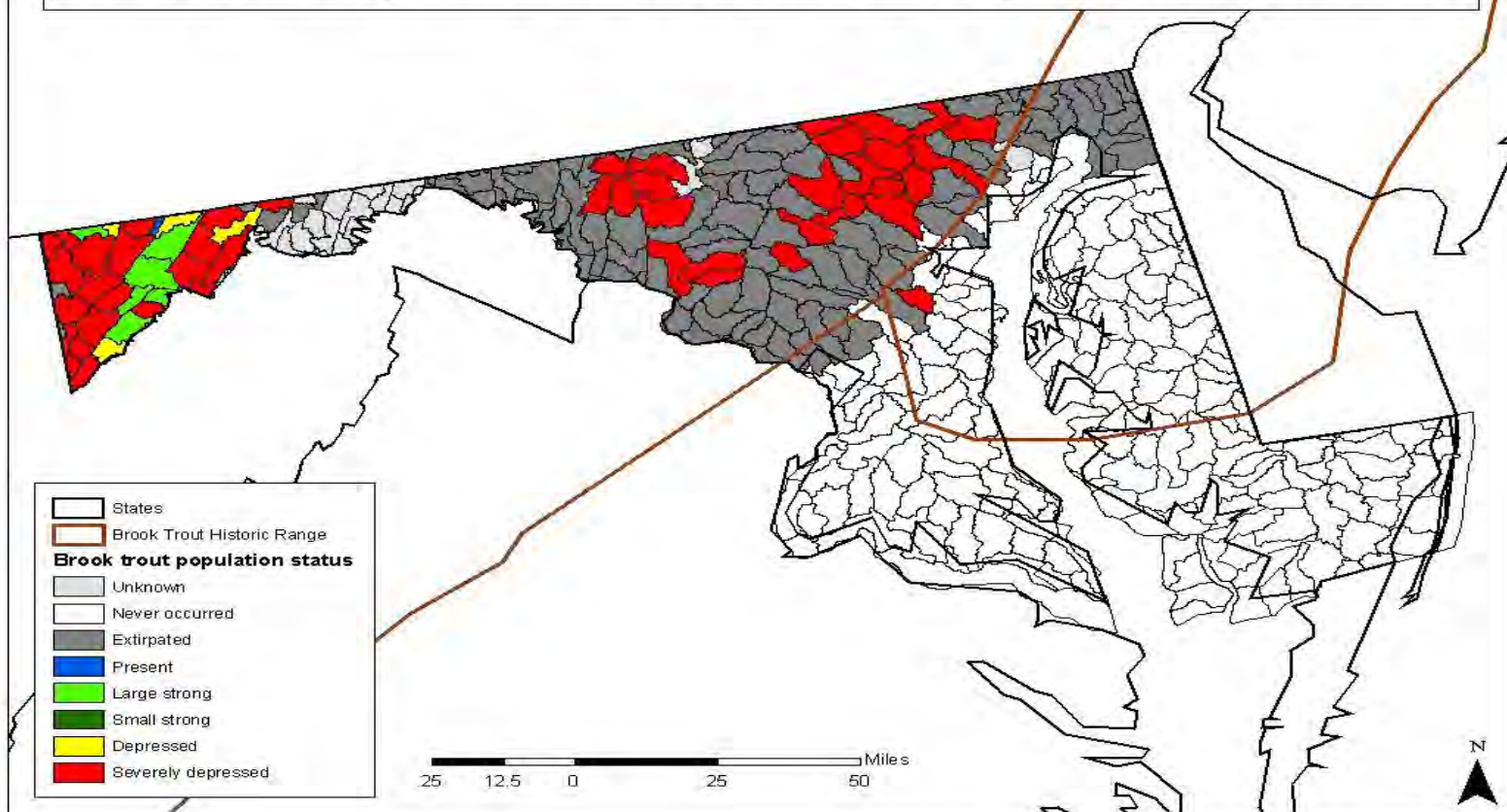


- Cold water - maximum water temperature below 18°C (70°F)
- In Maryland, flowing water (limited to streams now, historically found in larger rivers)
- Streams with pool/riffle habitat, clean rock and gravel substrate (sediment is death to brook trout)
- Pristine water quality - pH 5.5 - 8.0, low turbidity, low sedimentation, cold water, high dissolved oxygen
- Low impervious surface in watershed

Historic range of Brook Trout in MD pre-Settlement



Brook Trout Population Status for Maryland by 6th Level Watershed



-Range reduced to 43% of historic sub-watersheds populated

-Of these only 16% classified as Intact (>50% occupied)

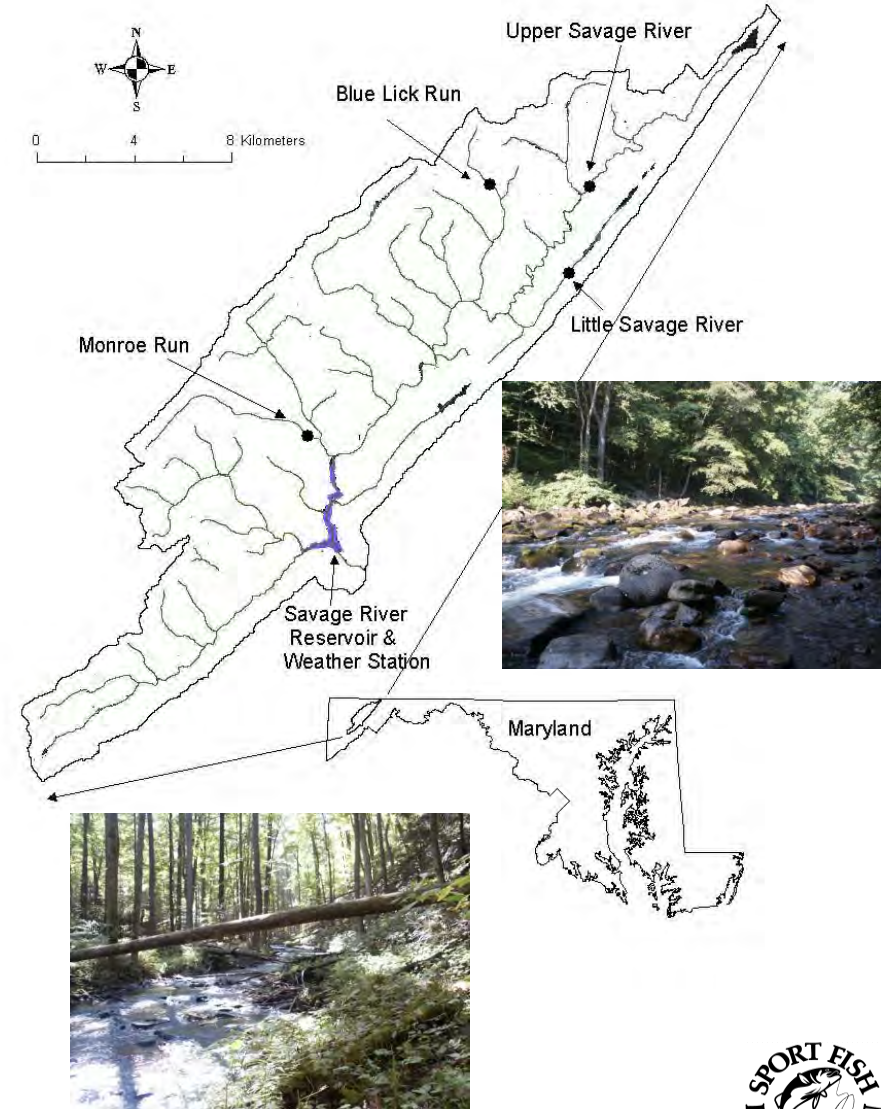
-151 streams, 377.5 miles



The Upper Savage watershed is unique and critical because...

Specifics:

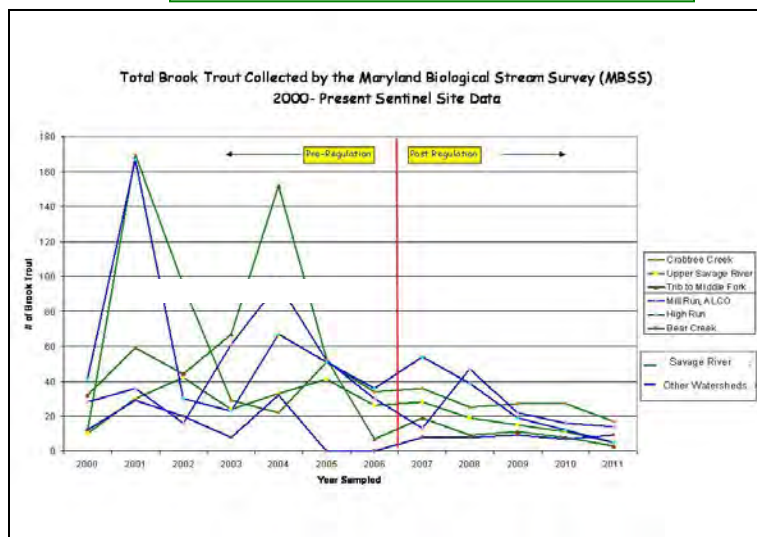
- Only unfragmented system in state
- 16 named streams + tributaries
- 100+ miles of interconnected streams
- 25% of all brook trout stream miles statewide
- Area predicted to be least affected by global warming
- Vast majority of bordering lands owned by the state



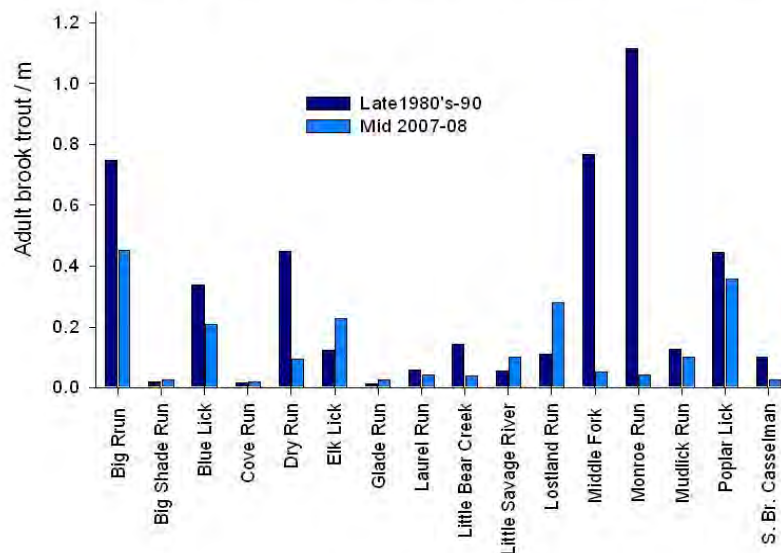
Background of Upper Savage River Catch and Release Regulation - Brook Trout In Decline

As the Agency charged with managing and conserving Maryland's brook trout resource, DNR evaluated population survey data, consulted with other fishery management agencies and reviewed the scientific literature. We found an alarming decline in Upper Savage River populations, associated with ease of angler access, and concluded that action was needed to halt and reverse this decline to protect Maryland's last remaining population stronghold and the public angling opportunities it provides.

The Upper Savage River is the only intact system remaining in Maryland, yet it has experienced substantial declines over the last two decades.



Local brook trout appear to be decreasing, UMCES Appalachian Laboratory Results,



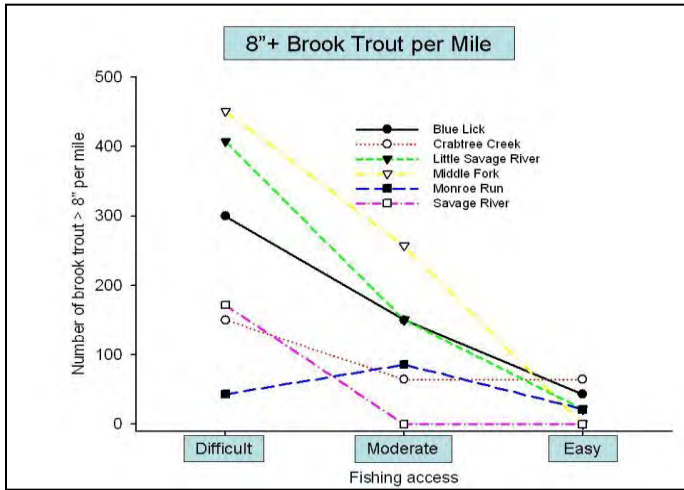
Public misperceptions...

- Populations are as good as ever
- Brook trout only live 2 - 3 years, can't grow larger
- Upper Savage is remote, no angling pressure
- Larger fish are not important to the population
- What works for brook trout management in Smoky Mt. Nat. Park is same as in Maryland

The Reality...

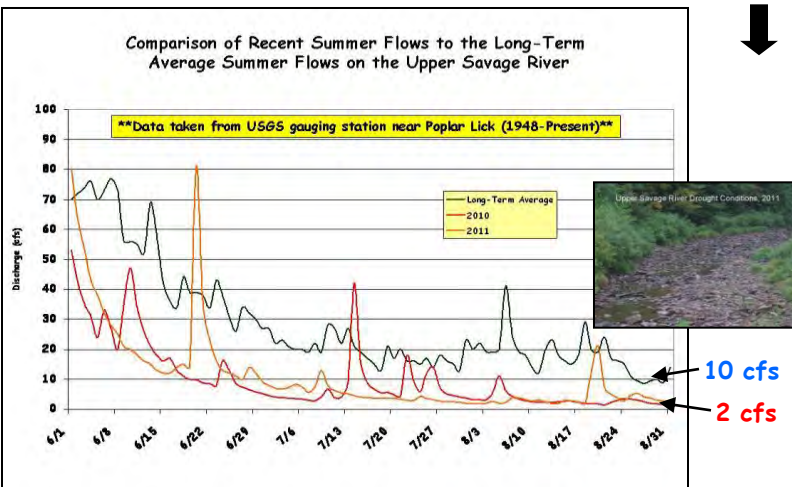
- Data shows that this is not true
- Brook trout can live up to 5+ years in Maryland streams, and can reach larger sizes. Since the C&R release regulation was implemented we have measured a 14" brook trout, and observed larger (up to 16")
- 2006 sampling: hooking injuries at all 24 sites surveyed, camp sites by stream, illegal ATV evidence,...
- Larger fish are vital to the biological viability of a population, and anglers desire and value the opportunity to catch larger fish
- Smoky Mt. Nat. Park system is different than Savage, not directly comparable (also no bait allowed)

Why Are These Populations Declining?

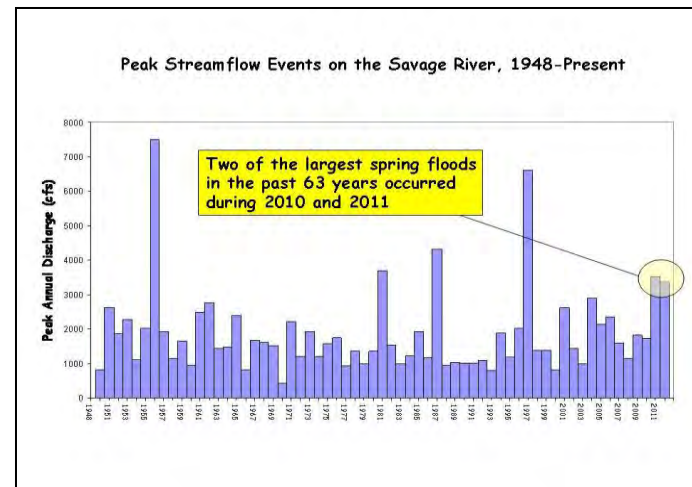


The greatest threats to brook trout populations are from habitat and water quality losses. **However** data shows that overall abundance and numbers of larger fish are lowest at access areas close to roads and camping areas, indicating that fishing is also impacting brook trout populations.

Recent fluctuations in environmental conditions have also negatively impacted both adult and juvenile brook trout populations in the form of extreme spring flooding and summer drought.



Low summer flows impact brook trout populations through overcrowding, increased predation, and elevated water temperatures. The last two years of summer flow in the Upper Savage have been as much as 500% less than the long term average.



Spring flooding dislodges developing eggs and greatly increases mortality in brook trout fry and young fish.

DNR Action In Response to Upper Savage River Brook Trout Decline

Action: On January 1, 2007 a regulation eliminating the harvest of brook trout while still allowing the harvest of brown and rainbow trout and other competing species was adopted. This regulation included a prohibition on using bait because many released fish die after being caught with bait; however **all types** of artificial lures are allowed for fishing, this is **not** a fly fishing only regulation.

The Objectives of this regulation are:

1. Restore the number of larger fish (>8 inches) in the system for biological and angling value.
2. Restore overall trout population densities, maximize survival, of larger, older trout.
3. Reduce angler related mortality, particularly of larger fish
4. Protect the only intact brook trout system in Maryland while still optimizing angling use

Comparison of Mortality Rates between Bait-Caught and Artificial Lure-Caught Trout



Results

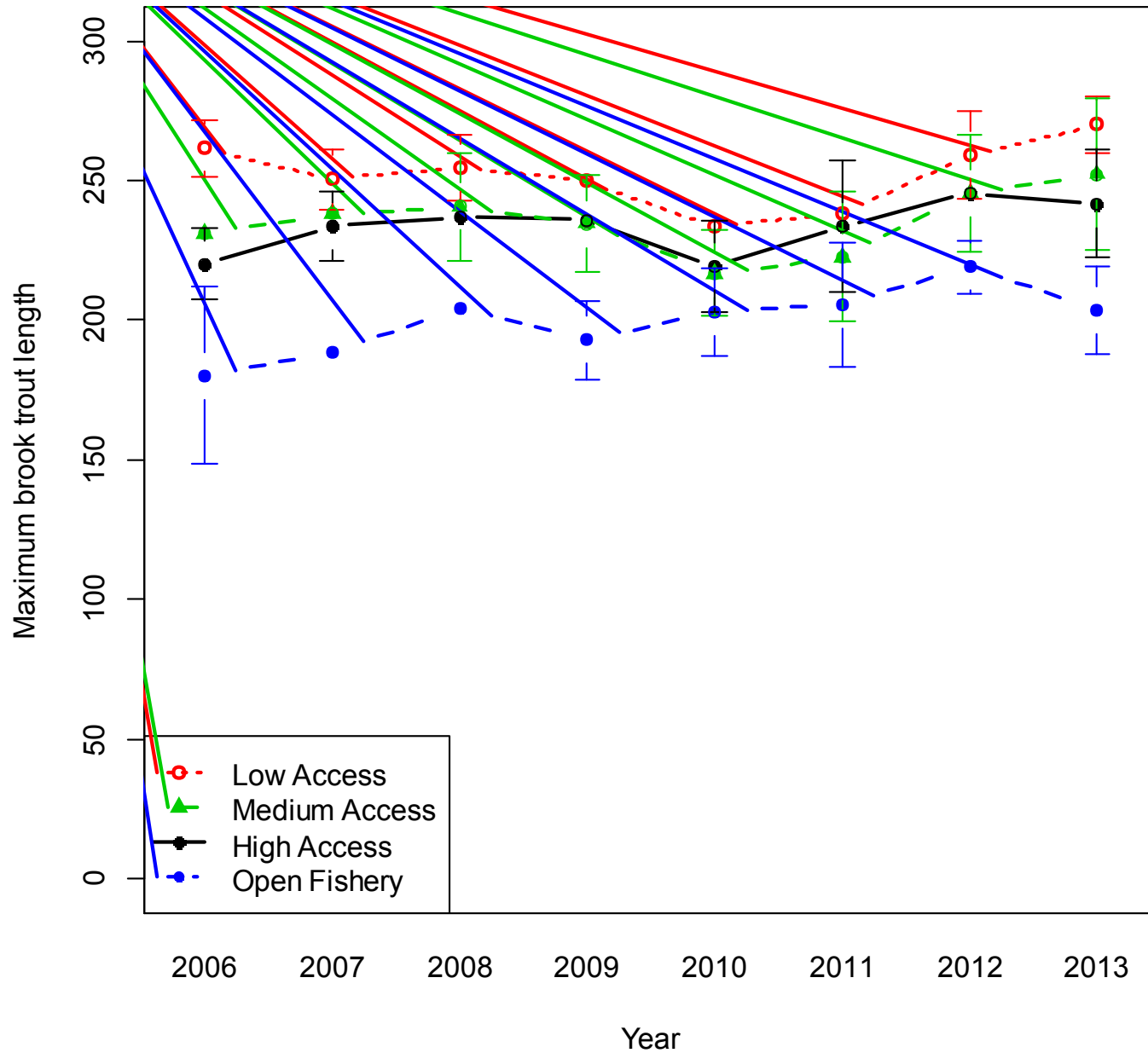
Objective 1. Restore the number of larger fish (>8 inches) in the system for biological and angling value.

- Adult (>8") populations are highest recorded since the 2009 monitoring year and trending upwards, but still remain below historic values
- All levels of angler access had brook trout maximum lengths greater than found at MBSS Sentinel Sites (open to harvest and bait use)
- There are nearly twice as many larger brook trout, on average, in sections with more difficult angler access than sections with easy access
- Pre-Regulation there were on average 4.9 adult trout per 75m section, post-Regulation there are 6.0 adult trout per 75m section, which extrapolates to over 4,000 more adult trout in the entire upper Savage system than prior to the regulation!
- Maximum size brook trout collected prior to regulation, <12" (extremely rare)
Maximum size brook trout collected after the regulation 14" (and trout estimated to be 16" have been observed by staff biologists!)



Upper Savage River Brook Trout 2013, 14"!

Maximum brook trout length



Results

Objective 2. Restore overall trout population densities.

- The overall population seems to have stabilized and is increasing for many, but not all, streams
- Most sections remain below historic highs but are trending upward
- All sections remain above the numbers found in the MBSS Sentinel Site streams (open to harvest and bait use)
- Given the current status of the populations and the above average YOY abundances in 2013, the collective brook trout population in the Upper Savage River system is on an upward trajectory
- High access sections are not recovering as well as medium and low access sites, yet they are typically the largest sections and should be the highest. This is a major concern and further research is planned



Results

Objective 3. Reduce angler related mortality, particularly of larger fish.

- An indicator of reduced angling loss is seeing similar population characteristics between heavily fished easy access sites and less accessible remote areas
- Results so far show that population attributes appear to be converging across sections through time, which is an indication that the regulations are having the intended effect
- Research on the Shavers Fork system in WV, similar to the upper Savage system, has shown a "push me pull me" relationship between presence of large fish in a system and overall population density. Those researchers are advocating WV Fisheries to adopt a C & R regulation
- Maximum size of large fish has increased

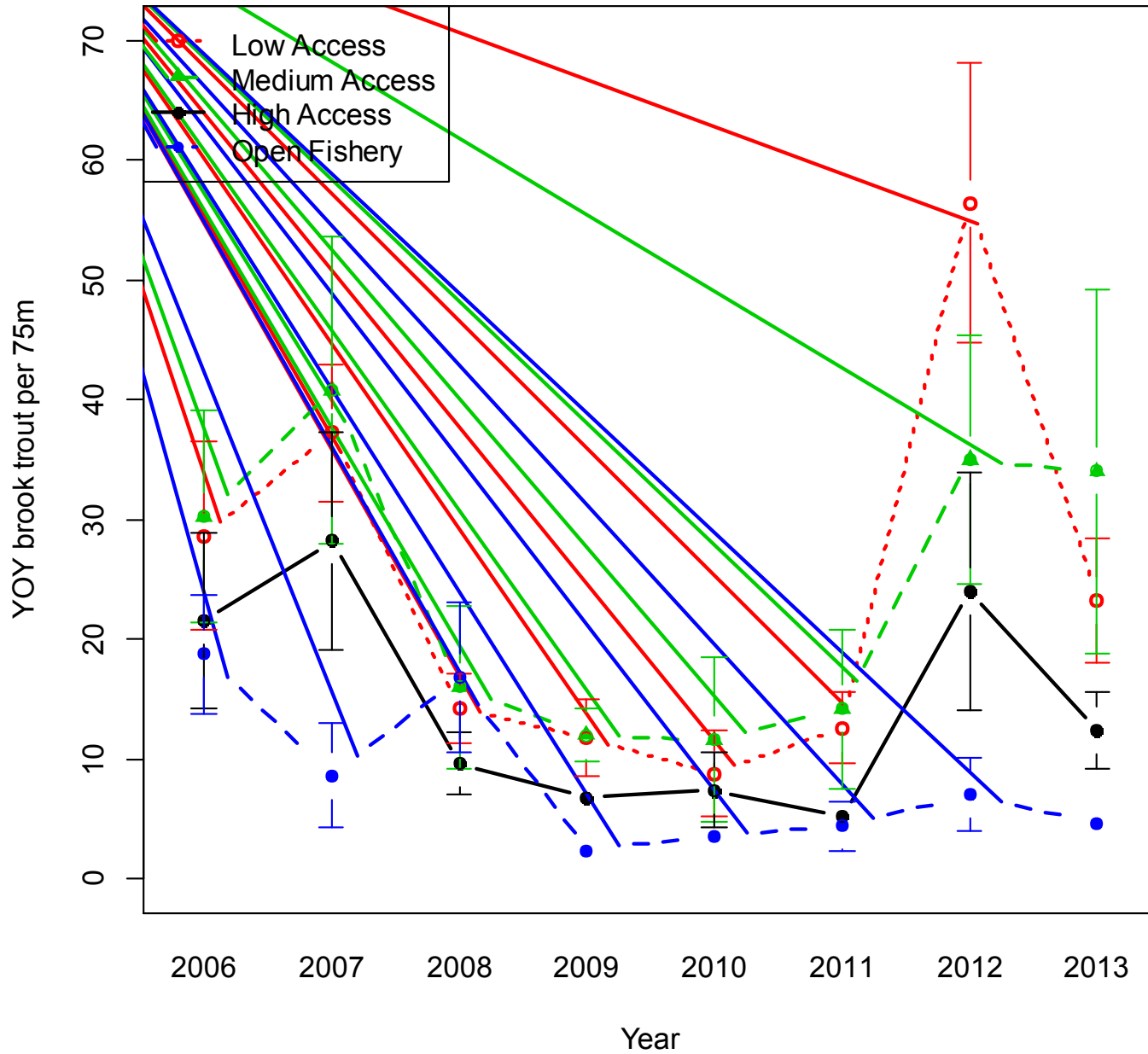
Little Savage River Monitoring, 2013



Upper Savage River 13.5" Brook Trout, 2011



YOY brook trout



Results

Objective 4. Protect the only intact brook trout system in Maryland while still optimizing angling use.

- There is no doubt that the current regulation provides better protection of brook trout populations than previous management.
- Study results suggest that the regulation has reduced brook trout angling mortality and moderated density declines caused by environmental conditions.
- This allows adult brook trout to live longer and potentially be caught more than once.
- As a result, high quality fishing has and can be maintained through extended periods of adverse environmental conditions.
- Numerous anglers have reported improved fishing success for larger brook trout since adoption of the new regulation.



First 9" Brook Trout, Little Savage River, caught on a gold spinner, 2009!

Anglers' Comments to DNR Reporting Improved Fishing Success in Upper Savage River Brook Trout Management Area

“I have enjoyed fly fishing in Maryland in the last five years, my future wife and I fished probably over sixty days last year in Maryland alone. I just wanted to let you know that I would love to see a zero creel limit on brookies in every piece of water in Maryland especially the Savage. Keep up the great work!!!!” S.S. 2/20/07

” DNR is doing an outstanding job with the cold water fisheries in the state & protecting the brook trout streams in the Savage Mountains is brilliant work!!! Thanks”, C.F. 5/5/08

“I am writing to say what a wonderful fishery the Savage River Basin has become since the placement of no kill regulations on brook trout. I have fished several of the area tributaries and much improvement has been noticed in the size of fish as well as the numbers of fish. Thank you for these regulations”. G.A. 5/5/08

“Just got back from fishing the upper stretch of one of the Savage tribs. Amazing. I fished it last year and there is a notable difference in the size of the average fish. Tons of 10-12" fish. I believe that the Brook Trout regulations are having a positive impact even on the put and take area.” J. L. 5/28/08

“We recently finished our first full week western Maryland fishing trip. Eighteen happy participants came from as far as Oklahoma to participate. The high point of the week for many fishers was fishing a stretch of the upper Savage River and brook trout streams that flow into the Savage or the Savage River Reservoir. We caught a lot of fish, including 10" and 12 3/4" brookies from the Savage and a 9" brookie from a tributary.” B.B. 5/5/09

Anglers' Comments to DNR Reporting Improved Fishing Success in Upper Savage River Brook Trout Management Area

“I have fished the Savage River area since the year 2000, but never has it offered the quality in size and numbers of brook trout that it does today. This is outstanding fishing! It's appreciated by many, as I've talked to at least 20 different people fishing these streams that all have noted similar results since the zero creel limit regulations have taken effect.” J.A. 4/8/10

“On behalf of myself and my husband, I am emailing you to thank you for the no creel limits on brook trout in the Savage River Basin. Your brave program proves the great resilience of this feisty species. Other states should follow your example. We appreciate a short 2 hr drive from Ohio to enjoy brook trout fishing on the fly. Please keep this program going and we'll keep coming”. J.H. 4/10/10.

“I am an Ohioan and TU member who has recently fished the Savage tribs this spring. You have established a quality fishery. I am planning on returning soon. The MD DNR deserves praise for the hard work in establishing a class fishery.” R.I 4/13/10

“In the last year and a half, we have spent more and more time fishing the upper Savage River and the brook trout streams running into it. Fishing on these streams has improved with each successive trip and just keeps getting better and better. We caught a number of 10-12 inch brook trout in early October on the small streams. It is obvious that the reason fishing has improved so much on the upper Savage and its tributaries is the no kill brook trout regulation that the DNR implemented two or three years ago. We strongly support it and hope the DNR will continue it. It has not only improved our fishing experience tremendously, but it also preserves native brook trout, which are an invaluable natural resource that we must protect.” B.B. 10/28/11

Upper Savage River brook Trout Fall 2013



Photo by Jay Fleming