Angler Motivations, Preferences, and Attitudes towards Stocking and Protection of Wild Brook Trout Fisheries

Data collected and compiled by Michael Brunson, in partial fulfillment of Master's Thesis at Prescott College, AZ.

Overview

Surveys were distributed to Trout Unlimited (TU) members in seven randomly selected states in an effort to understand angler motivations, awareness of, and attitudes about their state's stocking practices and protection of wild brook trout fisheries. The states selected were within the eastern brook trout's native range, involved with the Eastern Brook Trout Joint Venture (EBTJV), and included West Virginia, Tennessee, Pennsylvania, Maine, Vermont, Maryland, and North Carolina. Survey results indicated that, while the majority of TU members expressed a strong understanding of their states stocking practices, they were still strongly interested in gaining additional information, indicating a need for more transparency regarding stocking habits and practices. Furthermore, survey results indicated that a large percentage of TU members still enjoy fishing for popular, nonnative, sport fish such as bass and brown trout. Additionally, support for policies protecting wild brook trout diminished as opportunities for catching larger fish diminished along with the removal of popular, nonnative sport fish. This trend in diminishing support for policies protecting wild brook trout was supported by the fact that the majority of respondents stated that the primary reason they fish is to be out in and enjoy nature, rather than for the fish they seek. Along with other conclusions made in the following report, I found it noteworthy that, based on survey results, fishing was based not on the actual fish, but the experience of simply being out in nature and enjoying, well…the experience.

Survey Results

1. Sample Size & Demographics

Of the roughly 25,325 Trout Unlimited members from the states surveyed, a total of 613 (n=613) completed the electronic survey (2%). One hundred forty from Maine (23% of total respondents), 113 from North Carolina (19% of total respondents), 28 from Tennessee (5% of total respondents), 30 from West Virginia (4% of total respondents), 236 from Vermont (38% of total respondents), 57 from Pennsylvania (9% of total respondents), and 9 from Maryland (1% of total respondents). Of those that responded, 93% were male and 67% were age 50 or older (Figures 1 & 2).

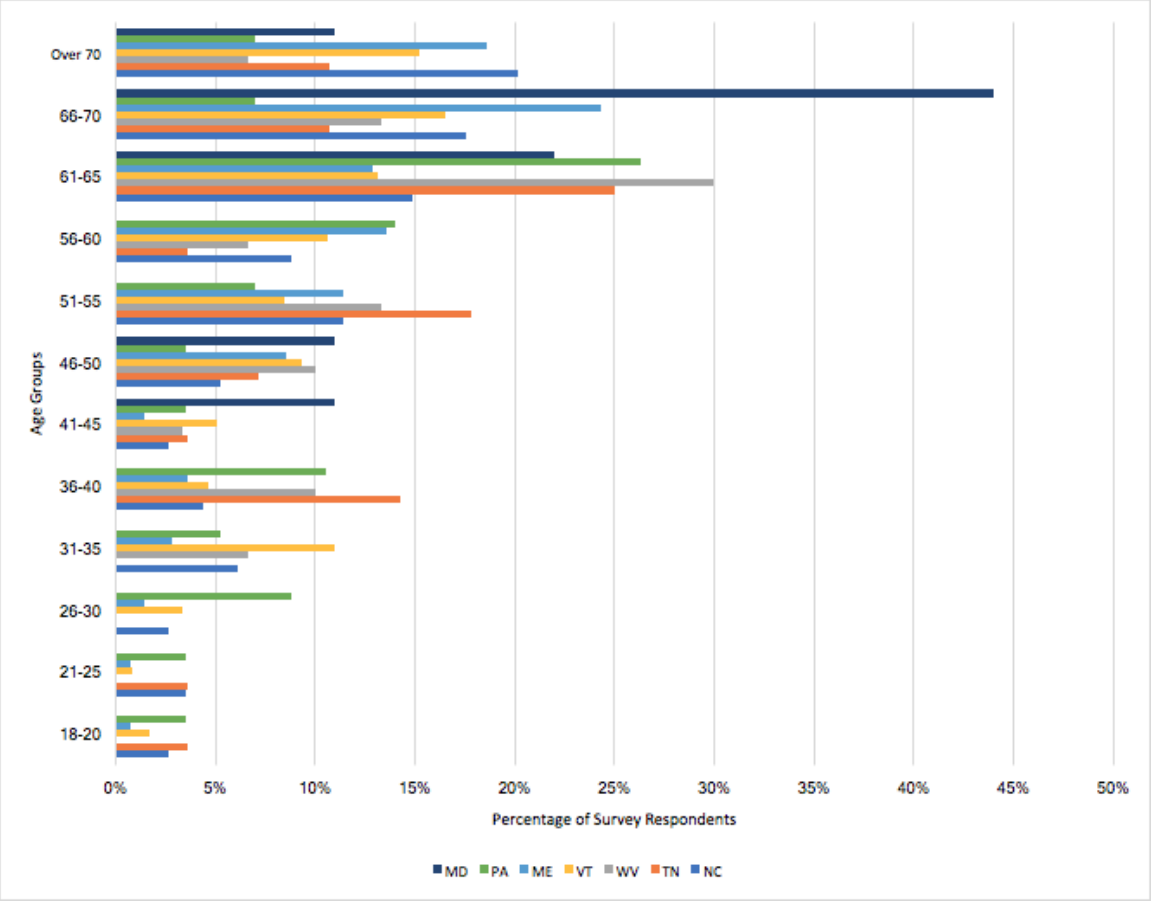

Figure 1: Breakdown of ages among survey respondents.

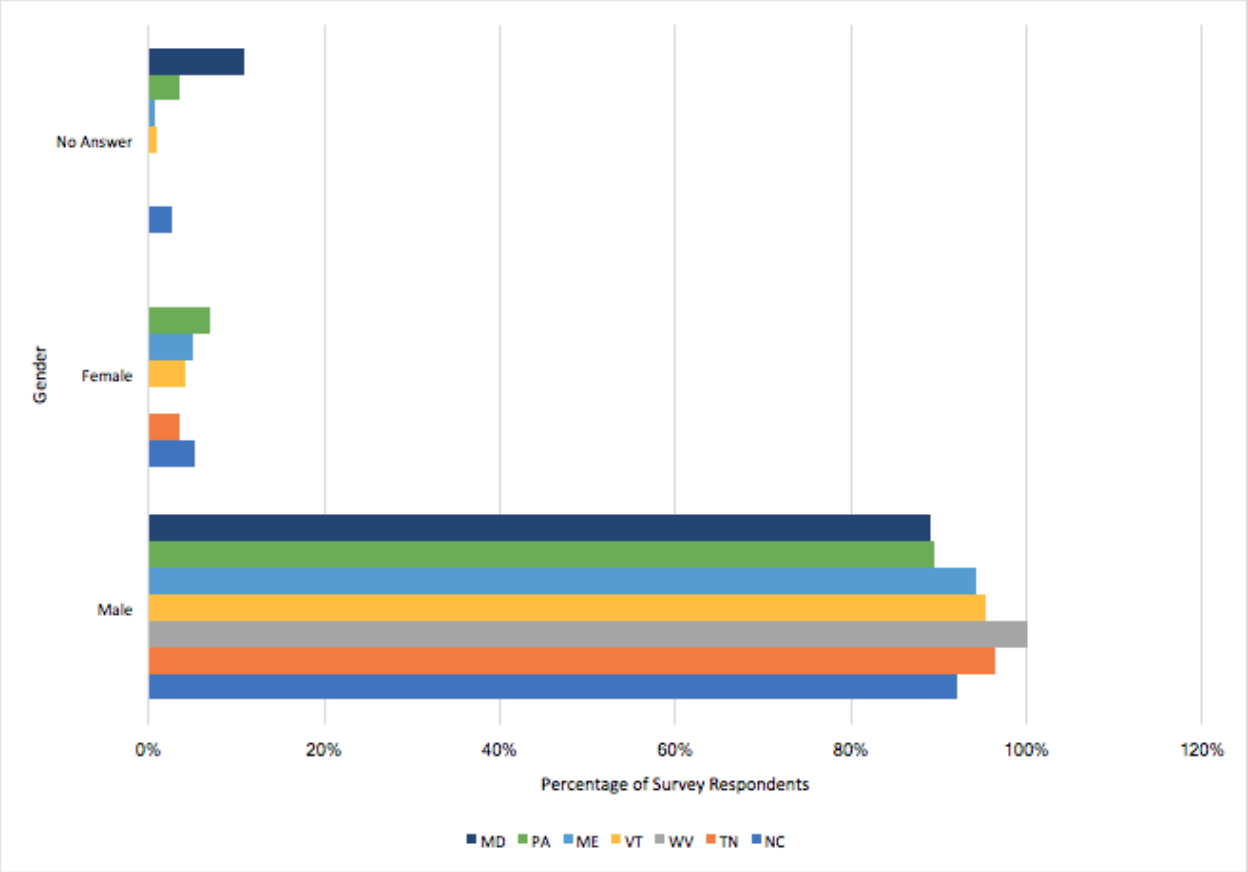

Figure 2: Breakdown of gender among survey respondents.

2. Survey Results: Angler motivations and preferences

Despite survey respondents being active anglers, the reason most given for fishing did not pertain to the fish at all. The majority of the 613 respondents (58%) stated that being out in, and enjoying, nature was the biggest reason they partake in the activity of fishing (Figure 3). This reason was followed by the motivation of fishing for sport (33%) and fishing as an act of relaxation (23%). In fact, 81% of survey respondents stated that they fish to be out in nature and for relaxation, indicating a focus not so much on the fish, but the experience. Fishing for the purpose of catching fish for consumption was the least recorded reason, accounting for only 2% of respondents. These results were further broken up into age groups of 18-40, 41-60, and >60. Reasons for fishing remained fairly consistent across the age groups with the exception of catching large fish (Table 1). As 10% of respondents age 18-40 stated it as a primary reason to fish as compared to 3% of 41 to 60-year-olds and those over 60 suggests that younger TU members place more importance on catching larger trophy fish. As this age group represents the

future of the TU community, this has important implications for how TU, as an organization, influences fisheries managers to stock larger fish. Regarding method of angling, fly-fishing was the primary method among survey respondents. Over three-quarters of respondents (77%) stated they solely fly-fished, with only 4% stating they used the method of spin/bait casting, and 19% stating they often use both methods.

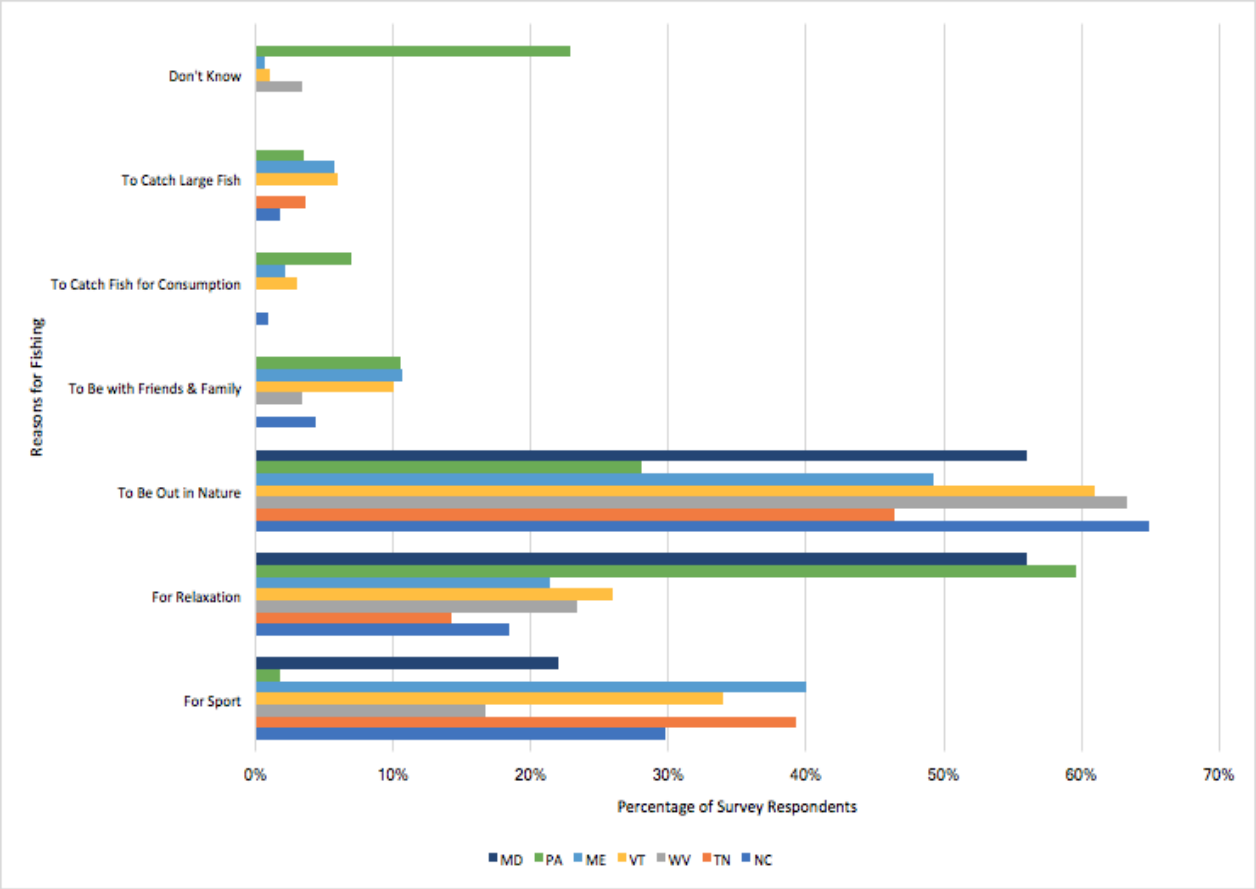

Figure 3: Reasons Trout Unlimited members from states surveyed fish, and percentages of respondents for each reason.

Table 1: Motivations for fishing broken up into age groups. The top three reasons of being out in nature, catching fish for sport, and fishing as a method of relaxation remained fairly consistent across all age groups. The 18-40 age group put more importance on catching larger fish than the older age groups, suggesting that younger anglers prefer fisheries providing larger fish to catch which are often provided through stocking.

Reason to Fish	18-40 (n=115)	41-60 (n=197)	60+ (n=301)
For Relaxation	25%	26%	19%
To be out in Nature	59%	59%	54%
For Sport	33%	30%	35%
To Catch Large Fish	10%	3%	3%
To Catch Fish for Consumption	3%	3%	2%
To be with Friends/Family	12%	6%	10%
Don't Know	3%	<1%	0%

In response to being asked if they target certain species of fish, 98% responded. Of those who responded, 76% of respondents stated they do target specific species when fishing. The remaining 18% stated they sometimes target specific species while 4% claimed they do not target specific species at all. Those respondents who claimed to target certain species tended to target the species of trout more than others but brook trout were not consistently favored among the various trout (Figure 4).

Of the 611 TU members who answered this question, 84% stated they specifically target brook trout, even if brook trout are not their favorite species to fish for. However, all three trout (brook, rainbow, and brown) represented the overwhelming majority of species targeted indicating that trout of any kind is often targeted. Revealingly, 39% of respondents indicating they often target bass, which included the saltwater species of striped bass, but also the warmwater species of bass. While trout and bass are not always sympatric, this finding is revealing because the two warmwater species of bass do represent a natural threat to brook trout suggesting that these respondents still pursue bass for the purpose of catching popular sport fish despite the ecological ramifications for trout.

In comparison, only 36% of respondents stated that brook trout are their preferred species and 24% stated that trout of *any kind* was preferred (Figure 5). After brook trout, individual

species preferred by respondents were brown trout (12%) and rainbow trout (7%). Similarly revealing to those anglers showing a preference for bass, 23% of respondents from North Carolina preferred brown and 32% preferred any species of trout (Figure 6). Only 18% of respondents from North Carolina preferred brook trout. Likewise, respondents from Tennessee preferred brown trout as much as brook trout (29%). Because brown trout represent a similar threat to brook trout as warmwater species of bass, this finding similarly suggests that these anglers will still pursue popular, nonnative, sport fish despite their impact on brook trout.

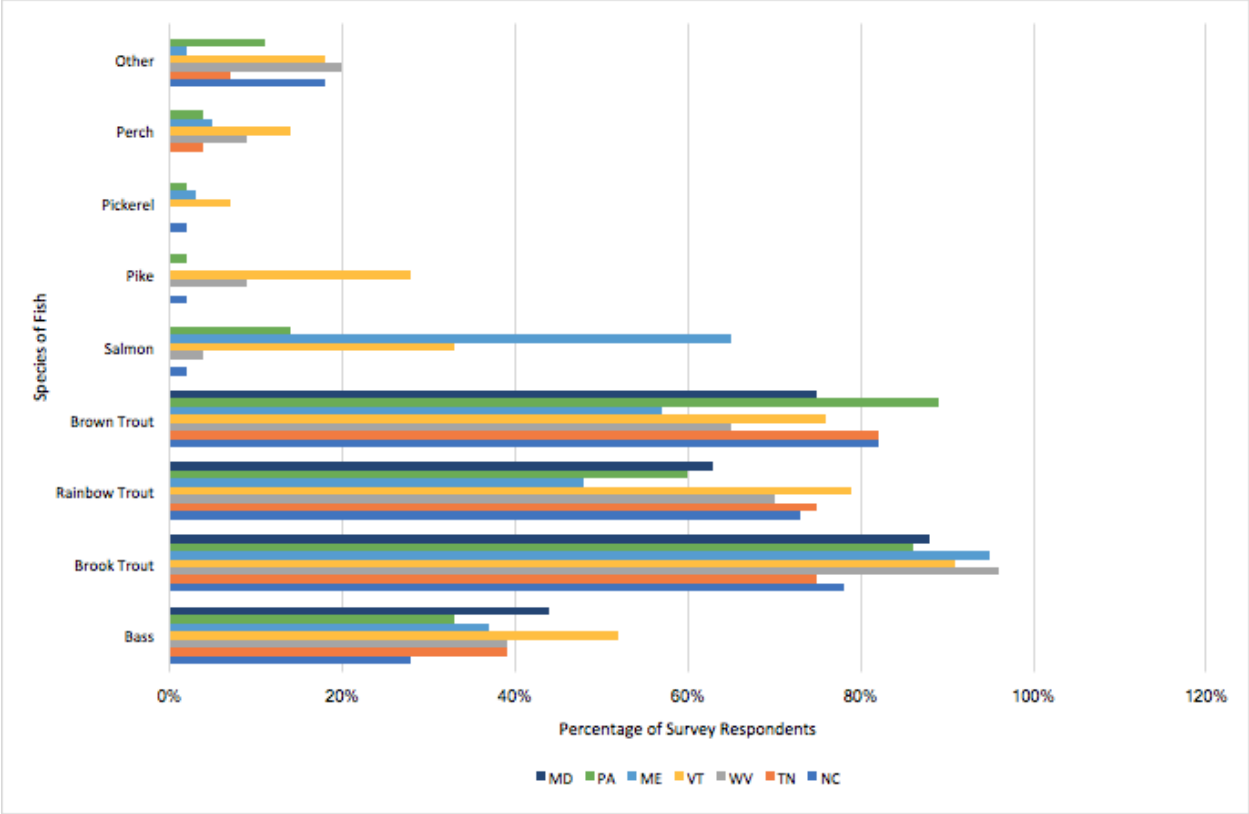

Figure 4: Fish species targeted by survey respondents. "Other" fish species targeted by respondents included, but was not limited to, barricuda, bluegill, species of tuna, redfish, drum, carp, catfish, bonefish, tarpon, gar, and walleye.

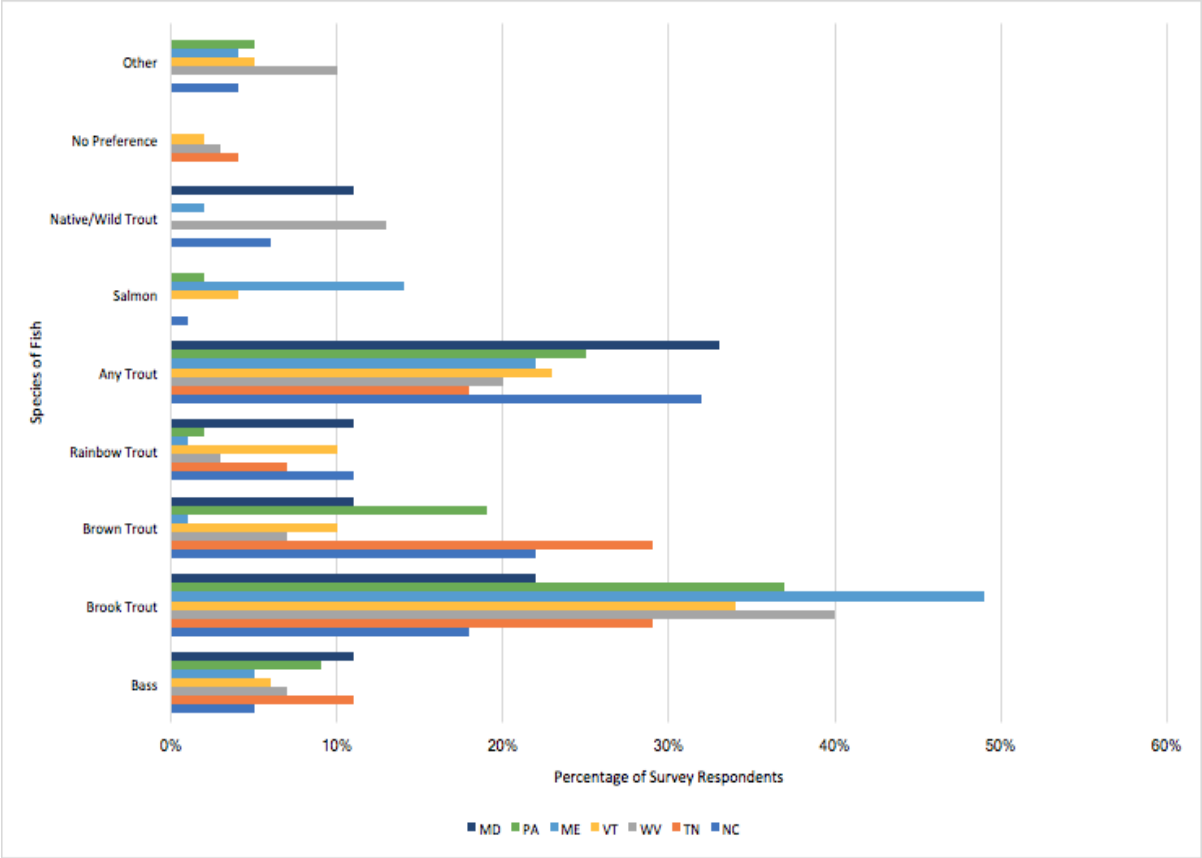

Figure 5: Preferred species to fish for by survey respondents. "Other" fish species included a variety of species including, but not limited to, crappie, bluegill, muskie, permit, snook, and tarpon.

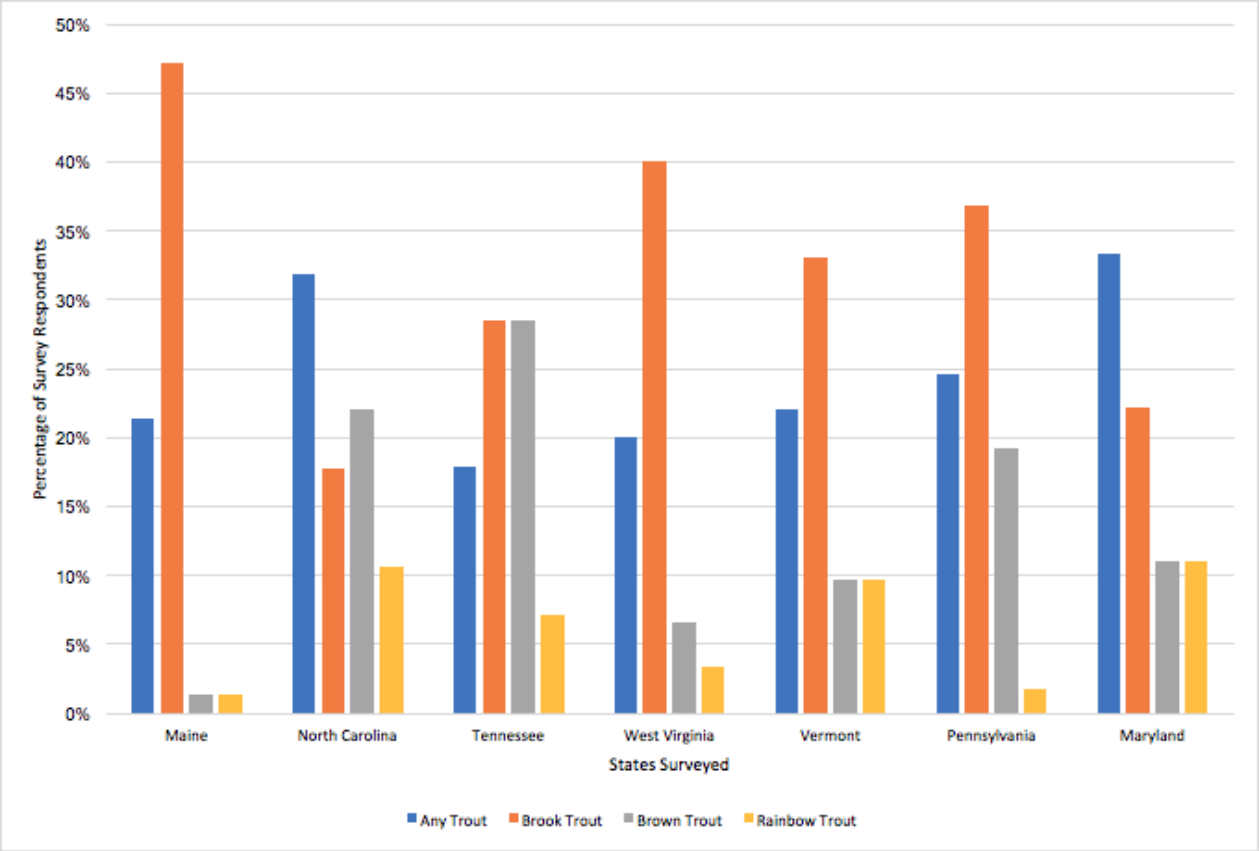

Figure 6. Preferred species of trout to catch by TU member survey respondents. Of particular note is, of those surveyed, North Carolina TU members prefer brown trout over brook trout, and Tennessee members prefer brown trout equally to brook trout.

3. Survey Results: Angler Understanding and Support of Stocking Programs

Overall, results were mixed when it came to respondents' positions on the topic of stocking hatchery-raised fish. Regarding stocking, 98% (n= 599) of respondents stated they were aware of their state's stocking practices. Of that percentage, 33% (n= 202) said they had some understanding of those stocking practices. This level of understanding was followed by a strong understanding (31%), a small understanding (24%), a limited understanding (10%), and lastly no understanding (2%). Overall, over half (64%) of survey respondents stated they had some or strong understanding of their state's fish stocking practices (Figure 7).

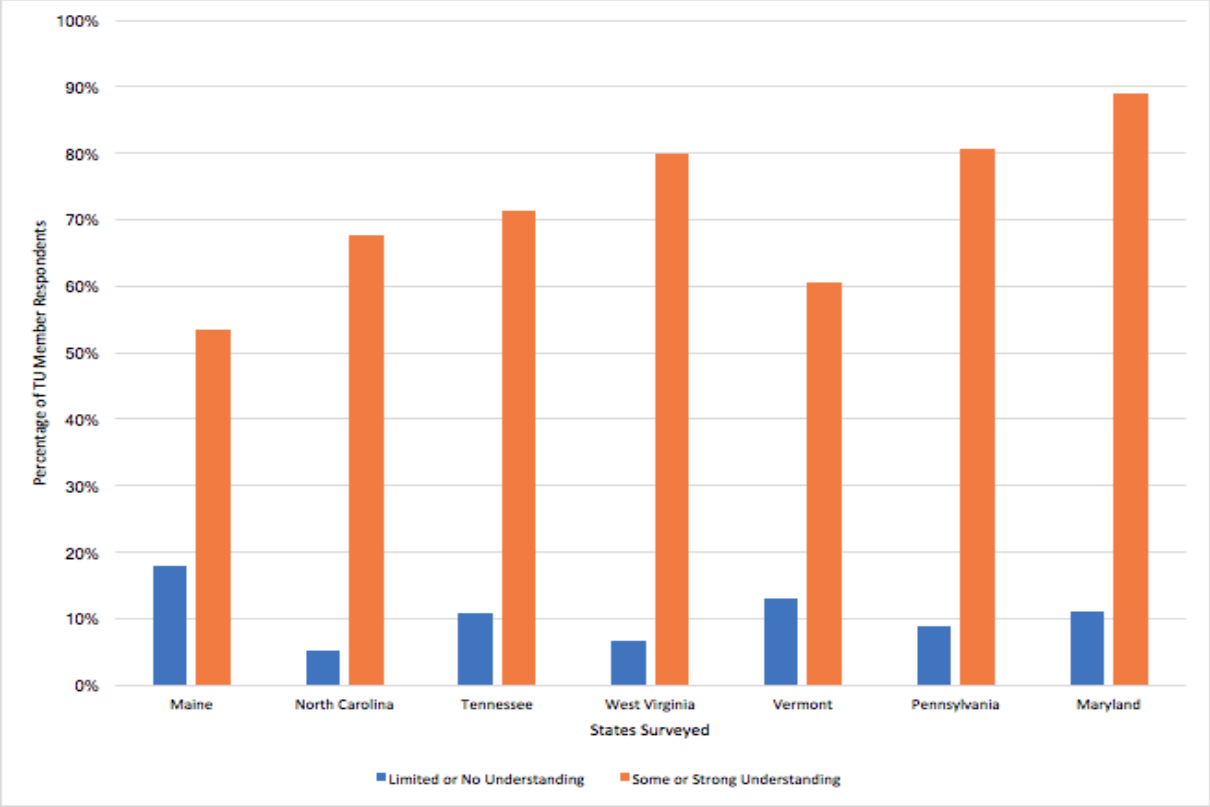

Figure 7: Individual states Trout Unlimited member survey respondents level of understanding of their states fish stocking practices.

In regard to level of support for stocking hatchery-raised fish, 33% of respondents reported feeling neutral about their states stocking practices. Feelings of strong support (28%) followed by some support (24%), somewhat opposed to (11%), and strongly opposed to (4%), rounded out the responses concerning support of state stocking practices (Figure 8). Such a small minority (15%) of survey respondents opposing their states stocking practices reflects the popularity of anglers fishing purely for sport, as previously noted.

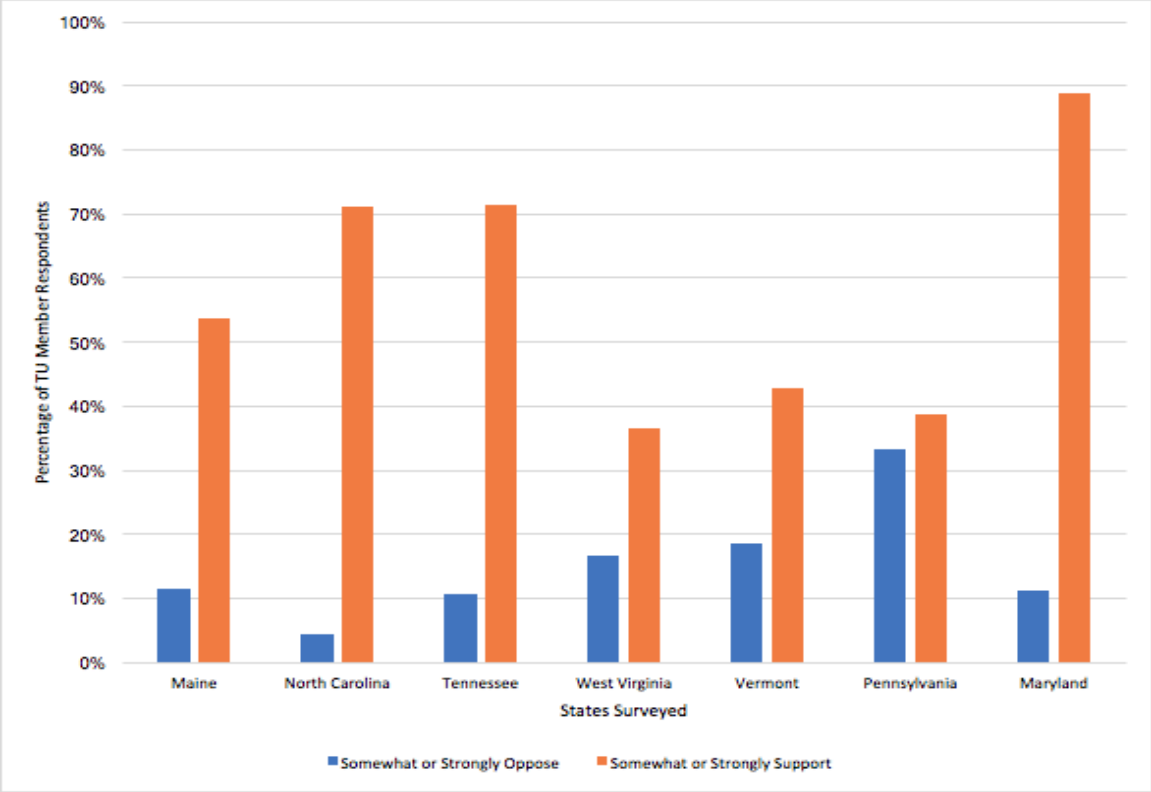

Figure 8: Trout Unlimited member support of stocking practices within their respective state.

Within each state, North Carolina TU members showed the most support for stocking practices with 45% of respondents stating they strongly support their states stocking practices. North Carolina was followed by Tennessee (41%), Maine (31%), West Virginia (27%), Maryland, (22%), Vermont (21%), and Pennsylvania (11%). Pennsylvania TU members reported having the least amount of support for their states stocking practices, with 33% of respondents stating they somewhat oppose or strongly oppose the stocking practices in Pennsylvania. Vermont was next with 19% of respondents somewhat opposing or strongly opposing their states stocking practices, with West Virginia (17%), Maine (12%), Tennessee (11%), Maryland (11%), and North Carolina (4%) following.

When comparing level of understanding of stocking with level of support of stocking in each state, those with some or strong understanding equaled those with some or strong support in Maine, Tennessee, and Maryland. North Carolina's TU members who responded only had slightly higher levels of support in relation to level of understanding. In the remaining states of

West Virginia, Vermont, and Pennsylvania, the percentage of respondents with higher levels of understanding of stocking practices was higher than the levels of support (Figure 9).

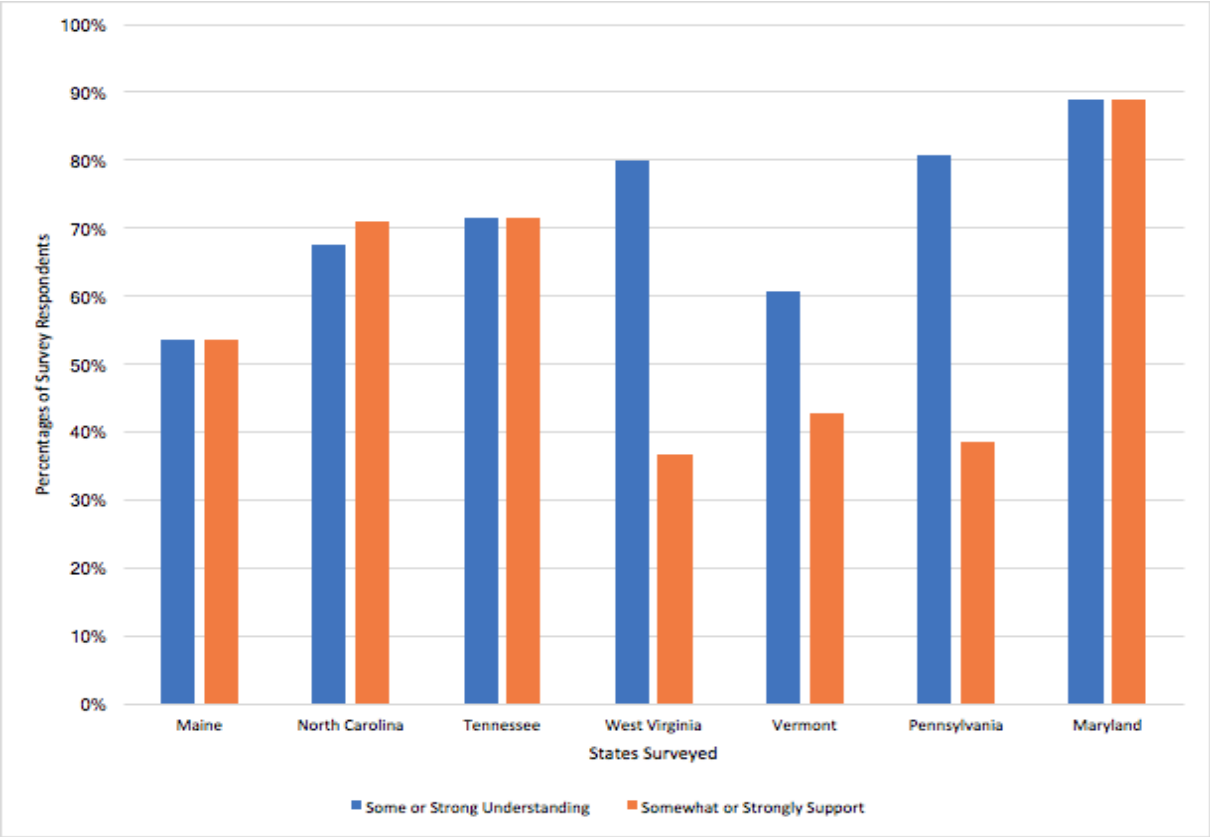

Figure 9: Comparison between respondents' level of understanding of stocking practices with respondents' level of support for those stocking practices.

While not statistically significant, this does suggest a trend. A possibility for this trend could be that, due to their greater level of understanding, respondents in these states have a greater understanding of the potentially negative impacts of stocking. Conversely, respondents could be misjudging their level of understanding. Further inquiry would have to be made to fully comprehend this trend. It should also be noted that 58% of respondents stated they would like to learn more about their state's stocking practices, indicating a need for more educational materials and/or outreach programs pertaining to fish stocking habits and practices (Figure 10).

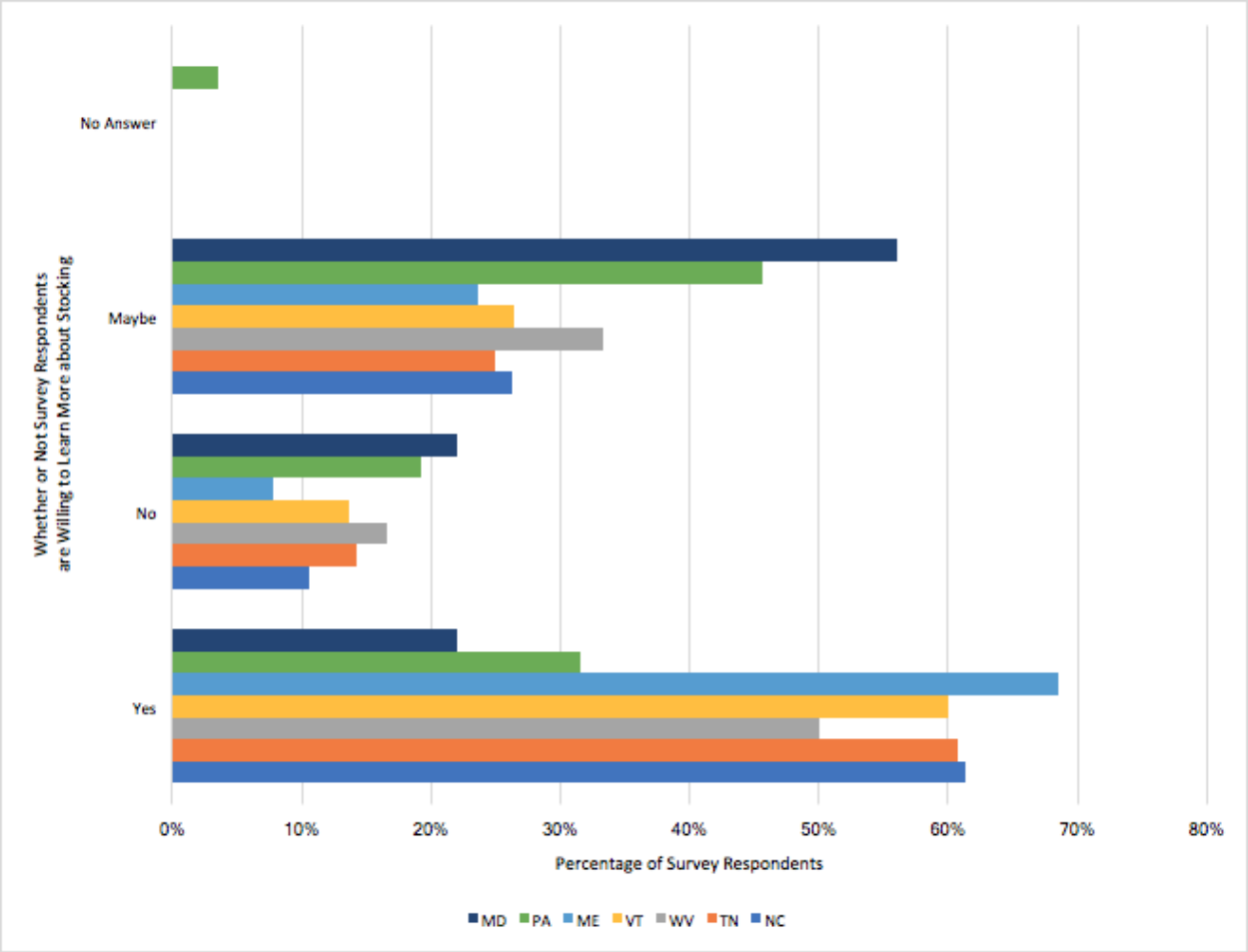

Figure 10: Percentage of survey respondents expressing a desire to learn more about their states stocking practices.

4. Survey Results: Angler Attitudes Towards Wild Brook Trout Fisheries

While overall there was angler support in protecting wild brook trout, survey results illustrated an interesting trend. When asked if anglers fish specifically for brook trout, 68% of respondents say they do, while 52% of total respondents stated it is very important for them to catch wild brook trout instead of hatchery-raised brook trout. These feelings were followed by 23% of respondents stating it was somewhat important to catch wild brook trout, 18% feeling neutral about it, 5% stating it is not very important, and 2% stating it is not important at all (Figures 11 & 12). While barely a majority said it was very important to catch wild brook trout, 86% of respondents said it was very important to have policies in place restoring and protecting wild brook trout. This answer was followed by policies being somewhat important (12%),

feeling neutral about policies (2%), not very important (0%), and not important at all (0%). It is interesting to note that while only 52% of anglers stated it is very important for them to catch wild brook trout, 86% percent of the group responded favorably to having policies in place to protect wild brook trout (Figure 13). This might suggest that these anglers still support conservation efforts that protect the species and their surrounding watersheds despite not having a strong inclination to fish for, or catch, wild brook trout.

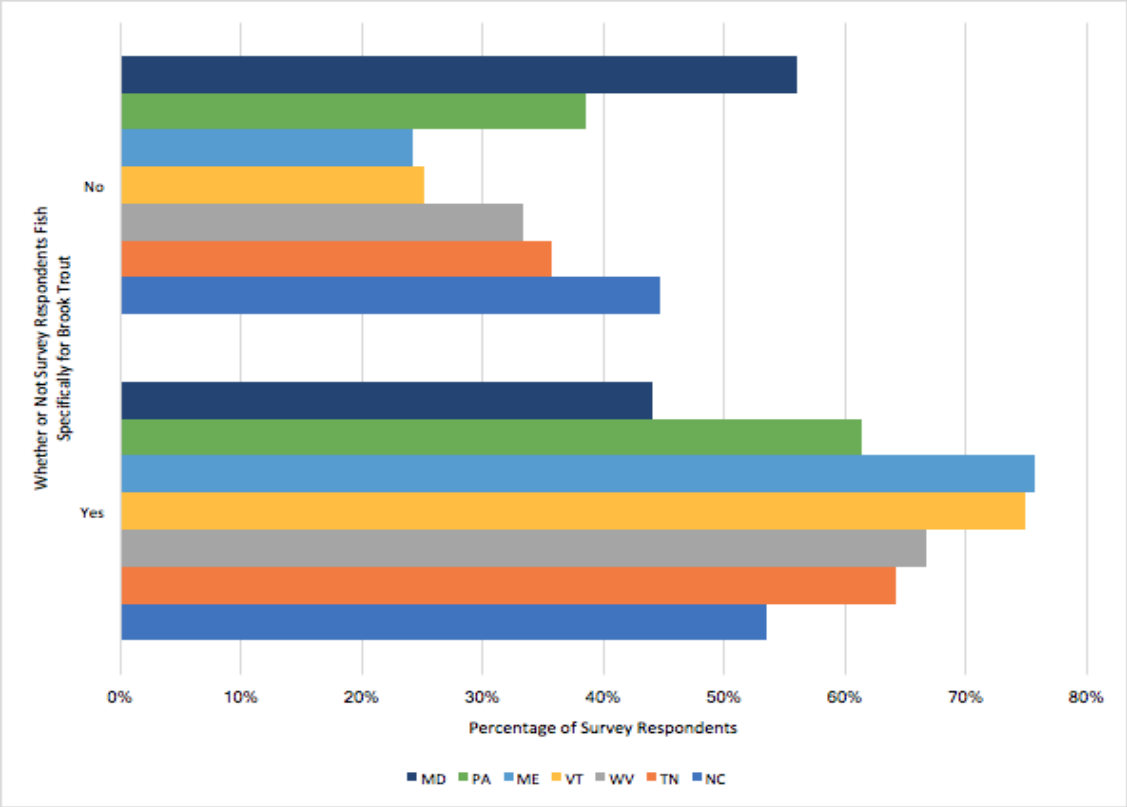

Figure 11: Trout Unlimited member survey respondents who fish specifically for brook trout.

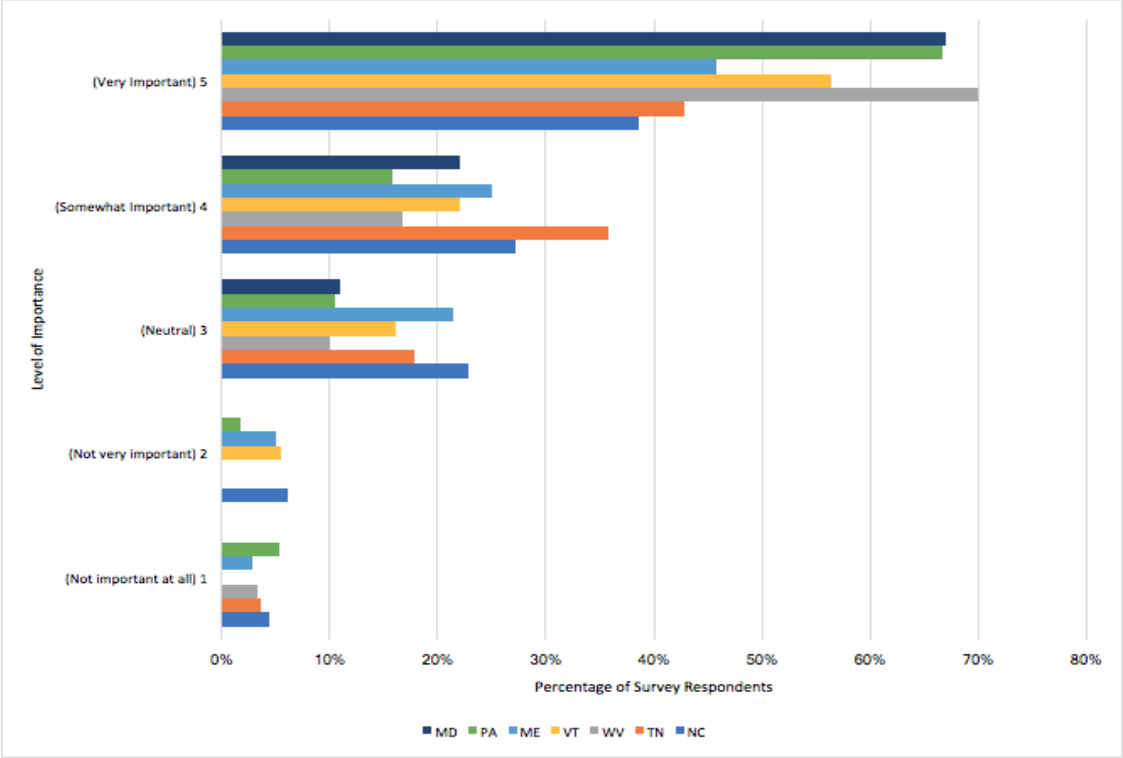

Figure 12: Level of importance in catching wild brook trout, as opposed to hatchery raised brook trout, among TU member survey respondents.

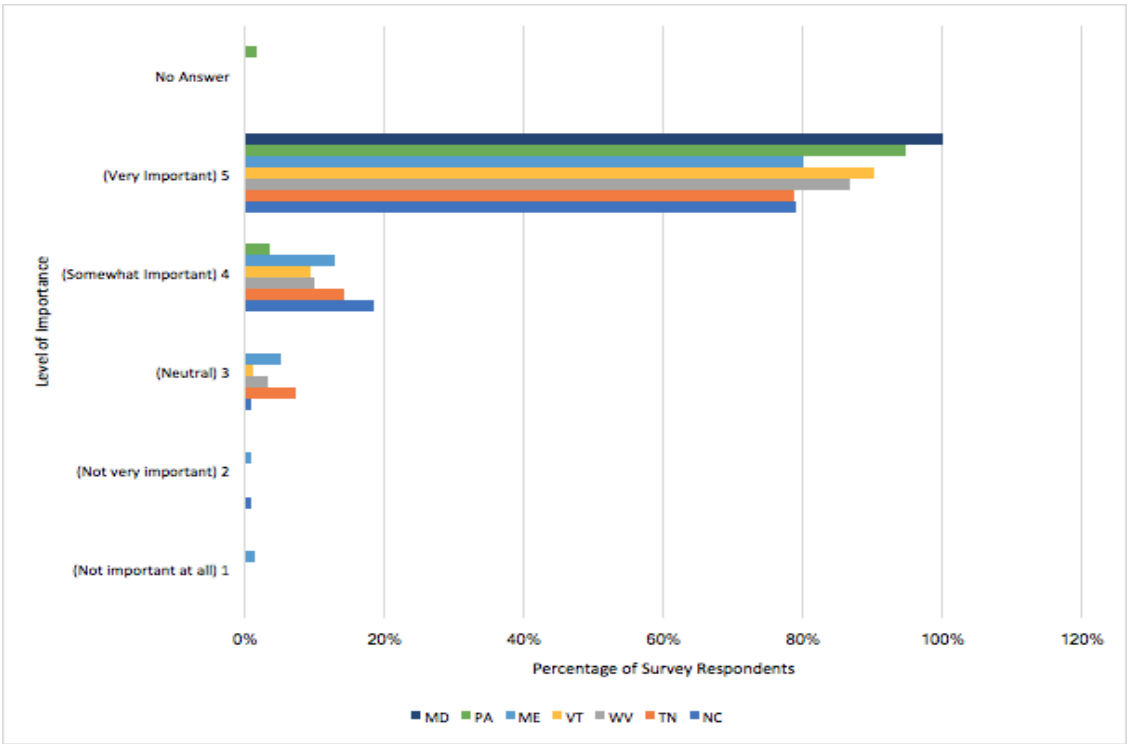

Figure 13: How important policies restoring wild brook trout populations are to TU member survey respondents.

When asked about their level of support regarding policies protecting wild brook trout despite those policies having other impacts on the fishing experience. When asked if they agree on policies protecting wild brook trout even if it meant stocking was limited in certain waters, 78% responded they would strongly agree with those policies. Remaining participants agreed (13%), were neutral about it (6%), disagreed (1%), and strongly disagreed (1%). When asked on level of agreement of policies that would protect wild brook trout even if that meant catching fish of smaller size, 74% strongly agreed, 16% agreed, 6% were neutral, 2% disagreed, and 2% strongly disagreed. Lastly, when asked about level of agreement regarding policies that protected wild brook trout even if that meant removal of nonnative sport fish, 52% of anglers strongly agreed, 22% agreed, 14% were neutral, 4% disagreed, and 3% strongly disagreed. The noticeable drop in level of agreement regarding removal of nonnative sport fish to protect wild brook trout suggests that many anglers, even those within the TU community, are still unwilling to give up the opportunity to fish for certain species despite their potentially negative impacts on wild brook trout (Figures 14, 15, & 16).

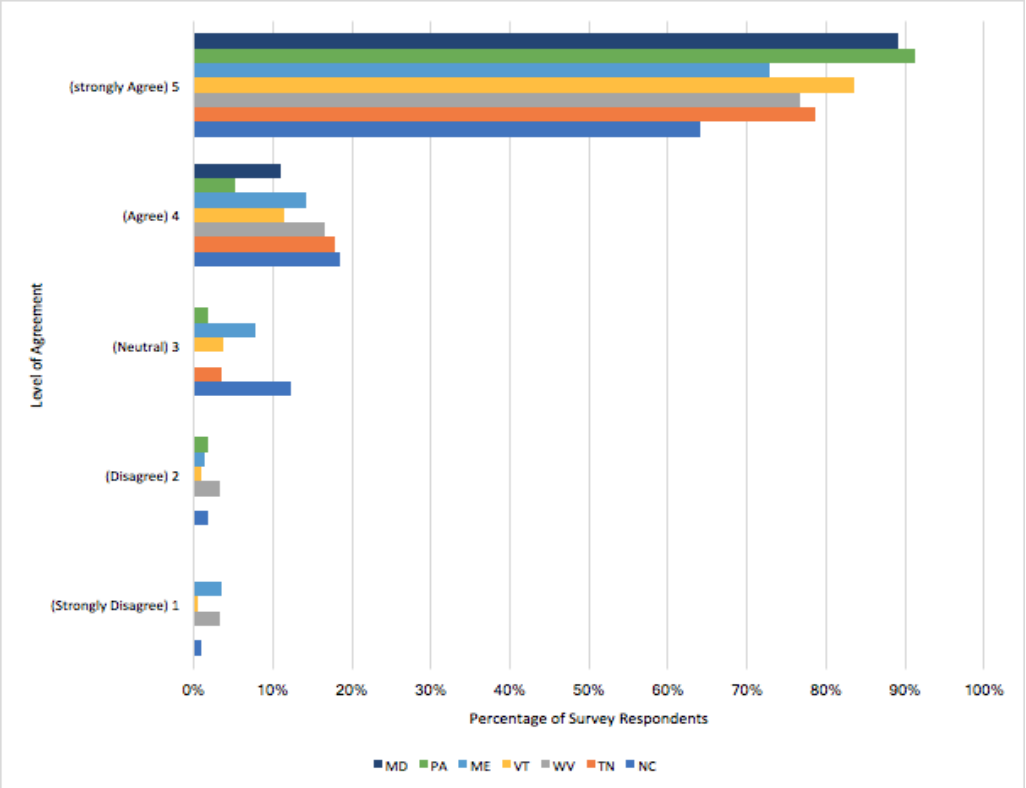

Figure 14: How much TU member survey respondents agreed in supporting policies protecting wild brook trout even if stocking was limited in certain areas.

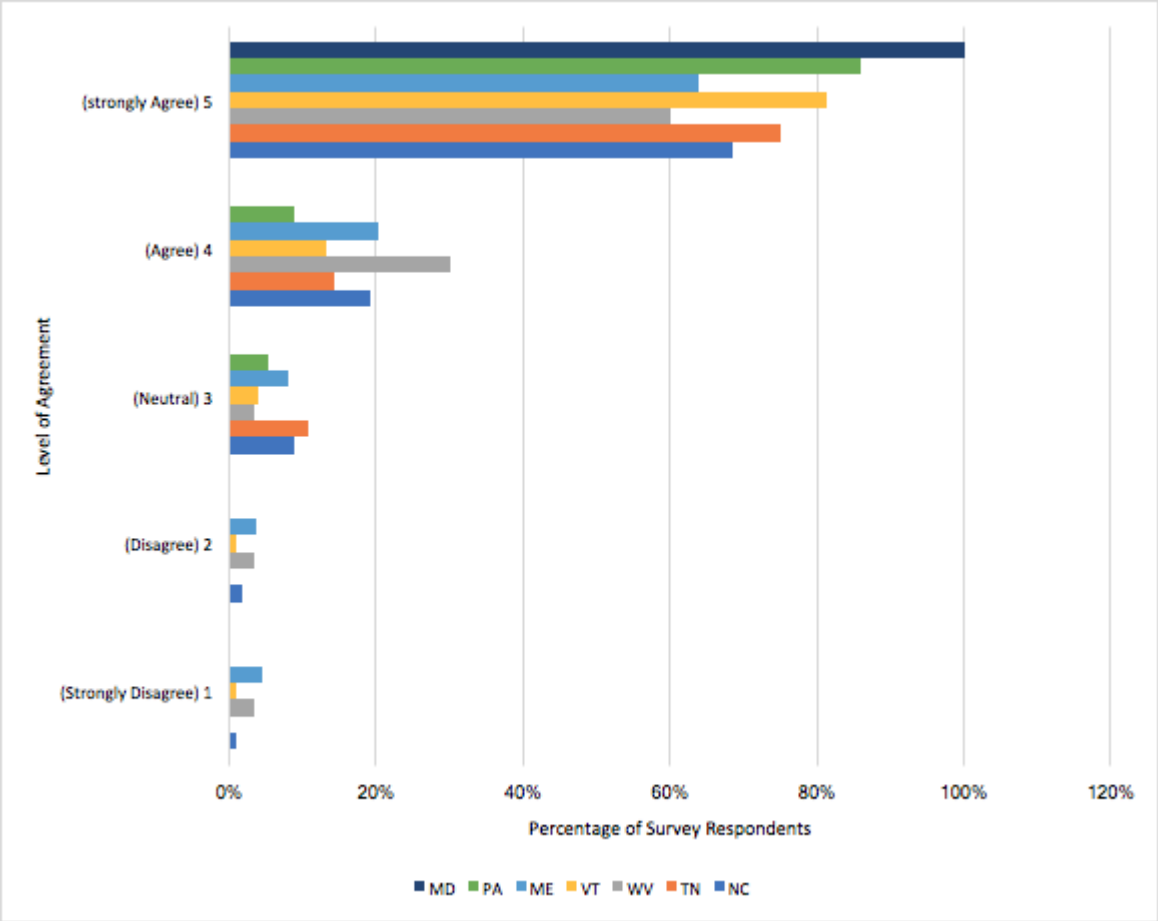

Figure 15: How much TU member survey respondents agreed in supporting policies protecting wild brook trout even if it meant catching fish of smaller size.

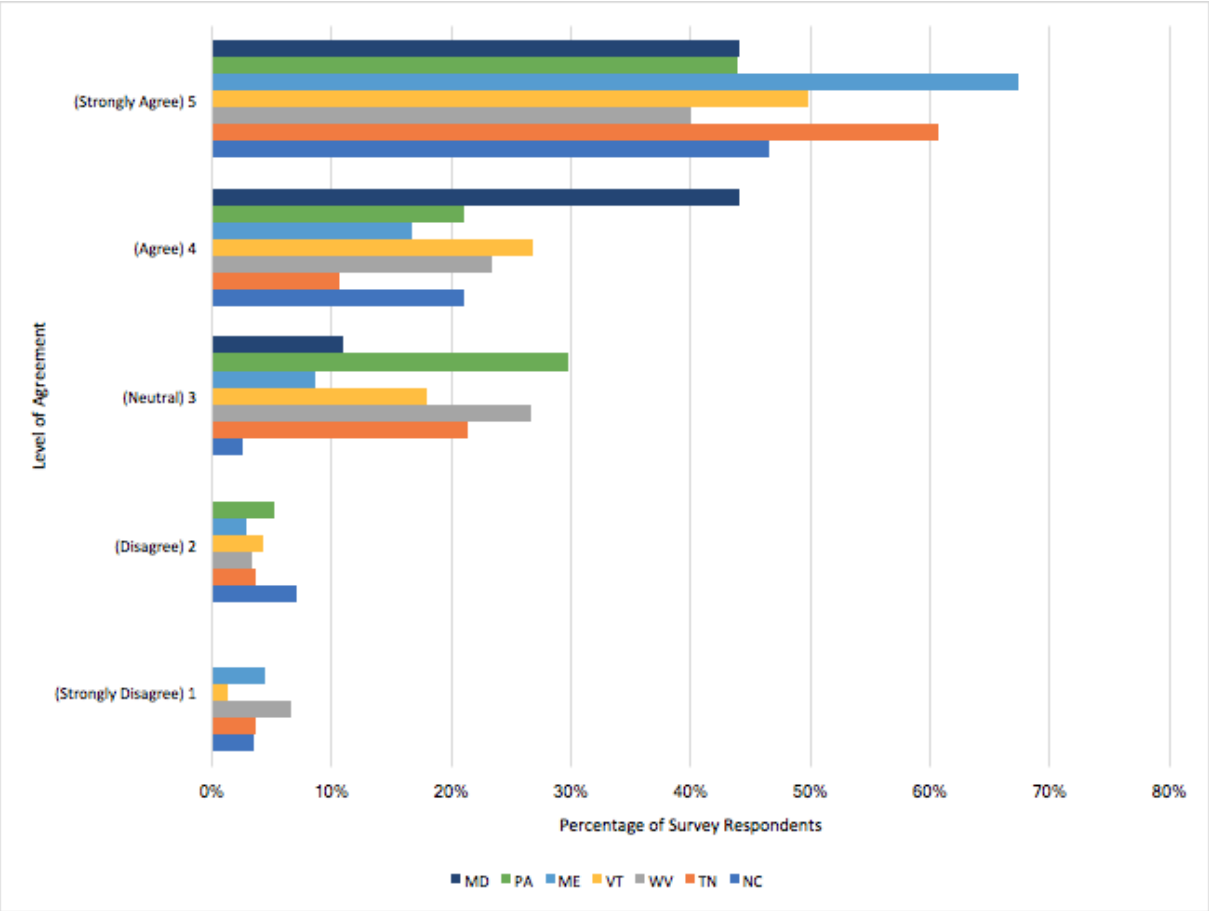

Figure 16: How much TU member survey respondents agreed in supporting policies protecting wild brook trout even if it meant the removal of nonnative, popular sport fish.

Further investigation of survey results was performed to look for any correlation between results. To address the research question, this analysis focused on the levels of support of stocking practices. The only correlation found was between age and level of understanding of stocking practices (Table 3). As respondents' age went up, so too did their level of understanding of fish stocking practices within their state. While this does not imply causation, it does continue to address the issue of education regarding stocking. A lack of knowledge and understanding in younger Trout Unlimited members regarding stocking equates to an uneducated population of conservationists who are often heavily involved in such issues. Without a comprehensive understanding of this important issue, the next generation of TU members will be inadequately prepared to collaborate with state and local agencies.

Table 3: Correlation values of survey questions when df=612(n=613), and when p=0.05, r=0.08 and when p=0.01, r=0.10. It should be noted that the only significant correlation was between age and

Correlation Variables	r-value
Age and Level of Understanding of Stocking Practices	r=0.12
Level of Understanding and Level of Support of Stocking Practices	r=0.04
Age and Importance of Catching Wild Brook Trout	r=-0.03
Level of Support of Stocking Practices and Importance of Catching Wild Brook Trout	r=0.03
Support of Stocking Practices and Support of Policies Protecting Wild Brook Trout Populations	r=0.03
Support of Stocking Practices and Support of Policies Protecting Wild Brook Trout Populations despite Limiting Stocking in Certain Areas	r=-0.01
Support of Stocking Practices and Support of Policies Protecting Wild Brook Trout Populations despite Catching Fish of Smaller Size	r=0.04
Support of Stocking Practices and Support of Policies Protecting Wild Brook Trout Populations despite Removal of Nonnative, Popular Sport Fish	r=-0.04

Overall, results from the survey illustrated that Trout Unlimited members within the study area had only moderate support of the stocking practices within their respective states. However, despite the level of understanding anglers had of their states stocking practices, the majority (58%) of anglers state that they would like to learn more about the stocking practices and programs in their state along with more than a quarter of anglers surveyed responding they "maybe" would like to learn more. As no specific follow-up question was provided asking what the term "maybe" meant to the angler, the following can be posited; anglers who responded could be referring to how that information is solicited. Within the study area, every state's fisheries department website contains information on stocking procedures as well as locations of where stocking is taking place. However, I would submit the idea that there are many anglers who would prefer a variety of resources through which to gather information on stocking habits, such as digital form, the use of pamphlets, other education material, and/or through public seminars. Follow up questionnaires could provide more information on how stocking practices

could be made more available as well as gaining a greater understanding of what it actually is that anglers are looking to learn about when it comes to their state's stocking practices. Overall, survey results reveal an opportunity for states to create more opportunities for anglers to find information on stocking practices.

The survey also highlighted an interesting trend regarding support of policies protecting wild brook trout. When questioned about how much they agreed with policies protecting wild brook trout despite limited stocking, catching smaller fish, or removal of nonnative sport fish, the percentage of anglers showing strong agreement in those policies declined with each successive question. Where 78% of all anglers surveyed stated they strongly agree with policies protecting brook trout despite limited stocking, 74% of anglers strongly agreed with policies supporting brook trout if it meant catching smaller fish, and 52% of anglers strongly agreed with policies to protect brook trout if it meant the removal nonnative sport fish. This decrease of strong support in certain policies emphasizes a proclivity, even among Trout Unlimited members, to seek out popular sport fish even if those sport fish are nonnative and could have a possibly negative impact on wild brook trout. This proclivity is further demonstrated in the fact that nonnative brown trout are sought after by 70% of respondents, second only to those targeting brook trout (86%). Additionally, a greater percentage of TU members in North Carolina stated that brown trout are favored over brook trout. Furthermore, an equal percentage of respondents from Tennessee favored brook trout as well as brown trout. As populations of brown trout are often sympatric with brook trout, and in many cases exceed brook trout in biomass in many eastern states (Fausch & White, 1981: Davis *et al*, 2015), angler preferences and attitudes both in and out of the TU community should be taken into account when managing waters where brook trout and brown trout coexist.

Regarding the Trout Unlimited community specifically, survey demographics illustrate the continued trend in the coldwater fisheries conservation group: an aging population and gender inequality. While 2% of respondents chose not to reveal their gender, only 5% of survey respondents were women. These results mirror Trout Unlimited's demographics with only 4% of TU national members being women (TU, 2011). Regarding age, 67% of survey respondents are 50 years of age or older. This data indicates a need for Trout Unlimited to generate more appeal to women and younger members. This should not be viewed as simply a need to get more individuals fly-fishing. It should be viewed as a need to get more individuals from a more

diverse demographic into conservation efforts. The potential impact that Trout Unlimited members can have on the protection of healthy watersheds benefits not only brook trout but society as well in the form of clean water, erosion control, and overall ecological health.