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Trout Fishing in the Smokies and the Blue Ridge, 1880-Present: How-To, History, and Habitat

A thesis
presented to
the faculty of the Department of Appalachian Studies
East Tennessee State University

In partial fulfillment
of the requirements for the degree
Masters in Appalachian Studies

by

Nathaniel Skaggs

May 2017

Dr. Kevin O'Donnell, Chair

Dr. Ted Olson

Dr. Ron Roach

Keywords: Fishing, Fly-Fishing, Appalachia, Environmental Science, Trout

ABSTRACT

Trout Fishing in the Smokies and the Blue Ridge, 1880-Present: How-To, History, and Habitat

by

Nathaniel Skaggs

This study focuses on trout fishing in the Great Smoky Mountains and the Blue Ridge Mountains from 1880 to 2017. I begin with a collection of personal narratives of fly-fishing in Tennessee to portray the allure of southern Appalachia trout fishing. I then describe the transition from native Cherokee fishing practices to sport fishing in the Smokies and the Blue Ridge by 1880. I explore a brief history of the National Parks and the United States Forest Service during the early 1900s, and address European fly-fishing influences in the United States during the twentieth century. I examine the habitats of the rainbow trout (*oncorhynchus mykiss*) and the native brook trout (*salvelinus fontinalis*) to provide an analysis on inter-species relationship between rainbow and brook trout in mountain streams. I then give an overview of important trout literature in the Smokies and the Blue Ridge through the twentieth and twenty-first centuries.

DEDICATION

I wish to dedicate this thesis to my beautiful fiancé, Mckayla Hawkins. She has been there from the beginning of this project and pushed me towards the final product. Without her constant support, I would have never made it to the end or be the person I am today. Through all the late nights writing, the continuous purchase of fly-fishing books, and random coffee runs, this thesis is for you, my love.

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I did not start my trout fishing journey until I decided to attend East Tennessee State University's graduate program in Appalachian Studies. From the beginning the region helped me experience the growing sport of fly-fishing and its benefit to both the environment and local business. I am thankful for all of the local fishing guides, anglers, and members of the Overmountain Chapter of Trout Unlimited for teaching me a life's worth of valuable knowledge. Without their help, I would not understand the importance of trout fishing in southern Appalachia.

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CHAPTER 1

INTRODUCTION

To look at the mountains of southern Appalachia from a map, you might find it hard to believe that an entire angling culture is hidden away beneath the trees and close to the rivers and the streams. The waterways of the Appalachian Mountains hold thousands of miles of trout with 845 miles of streams located in east Tennessee and 3,000 miles in western North Carolina (“Wild Trout Streams”). Within the Great Smoky Mountains and the Blue Ridge Mountains, trout are a center of angling attention. Although the fishing practices varied between the native people and the Euro-Americans, “the people relied on what they could harvest again and again,” and fish was a resource along the waterways of the Smokies and the Blue Ridge (Brown 15). However, as Smokies historian Margaret Lynn Brown and others observe, by the early twentieth century, trout fishing practices throughout the southern Appalachian Mountains began to shift focus more to recreation and tourism (Brown 116-117). Advanced rods, reels, and artificial lures replaced rudimentary structures, tools, and methods by the early 1900s.

The early fishing practices of the native people are important to the understanding of how trout fishing in Appalachia evolved throughout the twentieth century and into the early decades of the twenty-first century. Although contemporary anglers rarely use fishing methods from the Eastern Band of Cherokee Indians, the Cherokee knowledge aided in the understanding of local streams and rivers within the Smokies and the Blue Ridge Mountains (Altman 19-20). The connection between the angler and the allure of trout becomes more clear after I examine the Cherokee’s methods and the transition to angling.

While the late nineteenth century and early twentieth century brought major changes to trout practices and materials, the early 1900s also brought major environmental changes to the region. As enthusiastic industrialists entered the Smokies and the Blue Ridge from the northern states during the late nineteenth century, the need for commercial land and resources for development grew exponentially (Davis 163). The lumber industry began logging and clear-cutting during the 1880s, and by the 1920s, everyone realized the impact that the lumber industry was causing the Smokies and the Blue Ridge. Except for a few small remnants, the great forest was entirely logged.

While the extraction of lumber throughout southern Appalachia destroyed trout habitats, beginning in the late 1880s, environmental awareness and new resource management policies began, which eventually helped promote the creation of public lands that help to protect the land from large scale extractive industries (Karas 326). Environmental awareness increased throughout the twentieth century and scientific research on rainbow and brook trout helped promote the preservation and conservation of Appalachian trout streams. The creation of the Great Smoky Mountains National Park helped to regulate and to control trout populations as well as to provide restored habitat and fishable trout waters in the 1950s (Brown 186-187).

Contemporary trout fishing practices include methods of promoting the safety of the fish as well as preserving the environment for future anglers and promoting the protection of wild trout habitats and stocking programs. Instead of consuming the trout as a resource, the contemporary trout angler is more conscious of protecting the fish while enjoying the recreational sport. Recreational tourism that includes trout fishing began to emerge during the latter half of the twentieth century in the Smokies and continues to grow during the twenty first century (Brown 117). Southern Appalachia's image as a trout fishing hotspot in America

increased interest in fishing tourism during the mid-twentieth century. The collective experience expressed in trout fishing memoirs in the Smokies and the Blue Ridge provides the evidence that trout fishing in southern Appalachia is a method of promoting future trout fishing.

Conservationists use scientific data to help promote the preservation of Appalachia's wild trout population as well as to determine the need for stocking programs on the larger streams and rivers. By evaluating the importance of habitat management, one can understand the need for cooperation between trout anglers and state and federal employees in charge of natural resources, such as Tennessee Wildlife Resources Agency (TWRA) Officers in addition to State and National Park Rangers. These agencies are crucial to the continued growth in trout fishing in southern Appalachia through preservation and conservation programs.

In this thesis, I will examine trout fishing memoirs by authors Christopher Camuto, Harry Middleton, and Bob Shanks to help readers to understand the allure of trout fishing methods and lifestyles, and anglers' continued pursuit of new streams and rivers in southern Appalachia. The personal memoirs, authors express their own connection between fishing and place, while also discussing their own styles of trout fishing. One concern to the study regarding trout fishing practices in southern Appalachia is a result from multiple perspectives from each individual author leading up to the twenty-first century. The personal desire to keep trout fishing pure rather than promote the practice for recreational tourism helps limit of overharvesting of trout populations.

In order to place the historical, ecological, and scientific issues in perspective of trout fishing practices, I begin this study with a personal memoir about my own trout fishing experiences in northeast Tennessee to examine the current practices in the Smokies and the Blue Ridge. Through years of angling experience and habitat research, my personal memoir will help

show how recreational tourism, conservation agencies, and memoirs help promote interest in trout while historic practices and environmental history allow for an appreciation of current trout fishing values. You will be able to use all of the material to experience trout fishing in the Smokies and the Blue Ridge while gaining a better understanding and appreciation of the evolution of the practice.

CHAPTER 2

TIGHT LINES IN SOUTHERN APPALACHIA: MY YEAR WITH TROUT

The Middle Tennessee Pond

Why would you start fly-fishing in middle Tennessee when there aren't any trout here? I remember receiving a lot of these questions from family and friends when I first started thinking about fly-fishing, and the answer was always the same: I am preparing for trout fishing when I move to east Tennessee for graduate school. The local pond at the Kingston Springs city park stocks trout during the months of February and March when the temperatures help keeps the water cold enough to support a sustainable habitat for trout. The town of Kingston Springs hosts a fishing rodeo for the children of the community, to help children catch these trout before the summer months kill the fish, and to promote community activities. This pond is the perfect place for a novice fly angler to learn about casting and presentation with the hope of catching a trout. Looking back, I started my life as a trout angler as easily as possible, and while the purpose was to practice before relocating to more famous trout waters in Tennessee, I had no clue what I was getting myself into.

Instead of buying respectable fly-fishing gear, I purchased a cheap fly rod outfit that included the fly rod, reel, line, and a small selection of generic flies. Although the purchase was affordable, the ability to cast correctly and present the artificial fly was more than difficult, and the flies were not similar to any of the local insects. You get what you pay for with fly-fishing gear. Authors such as Don Kirk, Izaak Walton, or John Gierach did not mean anything to me as I struggled to cast the tiny fly a few feet in front of me. A local fly shop in Nashville, Tennessee helped me to pick out a few flies that were specific for bass rather than trout, after I swallowed

my pride and began asking for assistance. The shop workers pointed out that stocked trout for ponds would eat almost anything, but the bass flies would be useful for largemouth bass (*micropterus salmoides*) in the pond as well as smallmouth bass (*micropterus dolomieu*) in local sections of the Harpeth River. Fly-fishing initially seemed as if it would be easy to me, after I heard advice from people with experience, but the difficult art and skill of a trout fisherman became more obvious as I continued to struggle with the basics of casting.

On a cloudy day in March of 2015, I took off from work at the Nashville Gun Club, gathered my cheap gear and the few flies from the fly shop, and walked down to the murky pond to fly-fish for the first time. The casting of a fly rod has an art as well as a rhythm, and the ten-to-two cadence made sense to me in theory after I read Norman Maclean's *A River Runs Through It* (2001). According to Kirk Deeter and Charlie Meyers in *The Little Red Book of Fly Fishing* (2010), "there is no such thing as the perfect cast," which assumes that an angler just needs to get the bait out to the fish (5). The cast during traditional bass fishing is just a means to get bait to hungry fish and presentation is pointless, but for trout fishing, the cast does have to be close to perfect for perfect presentation of the fly. Presentation is the ability to lightly place the fly on the water's surface as naturally as possible for adult insects, or within the water column to simulate the underwater insect stages of life. I should have read Deeter and Meyers's little handbook before I even began fly-fishing, to learn about the difficulty of casting and how to present flies to hungry fish.

A cast in beginning was a grand total of five feet, and the fly hit the water like a small boulder without any form of presentation or precision. I cast again, hoping that the small fly pattern would reach far enough to attract a trout, and I succeeded with surprise. The fly line became quickly tight after stripping in the sinking fly and then returned to being slack in the still

water, and although the pond was free of underwater obstructions, I figured the hook had caught the bottom of the pond or on some weeds. The line went taut after another short cast and large splash, and the bent rod tip signaled a fish on the line. The fight lasted less than a minute before the fish presented itself at the water's surface, a ten-inch rainbow trout (*oncorhynchus mykiss*) (see figure 1).



Figure 1 - Rainbow Trout from Burns Park in Kingston Springs, Tennessee.

The feeling of the fight and catch of my first trout on a fly rod was addicting, and I quickly caught two more rainbows to take home and cook as a personal reward. The addiction increased during the next few days, and I ordered new gear along with fly tying kits and guide books for east Tennessee. While not a notable trout river or stream, the little pond in middle Tennessee inspired me to learn more about trout fishing in the Smokies and the Blue Ridge.

Match the What?

The rivers and streams of northeastern Tennessee contain an extraordinary amount of vegetation along the stream banks, and higher elevation mountain streams have vegetation that hangs over the stream. While the vegetation helps provide trout with terrestrial insects as well as

cover from predators, the tight space along the stream provides difficulty for casting to these hungry, wild trout. Four months after fly-fishing the little stocked pond, I replaced the cheap gear with equipment necessary to trout fish properly. This gear included new waders, two new rod outfits, a new pack and net, and fly tying materials to tie flies that imitate the local aquatic insects. The new rods varied in size: one for large tailwaters with 6-weight line and the other for small, mountain streams with 3-weight line. To the untrained eye, I probably resembled a typical trout fisherman in southern Appalachia, but to the local fly-fishermen of Elizabethton, Tennessee, I was a tourist with no trout fishing knowledge and did not understand their culture of fly-fishing. The practical knowledge of casting and reading the river, and the importance of hatches and the fly patterns, were unknown to me. I would only learn later that local anglers' biggest concern on the river focuses on matching the hatches throughout the year.

Trout fishing literature can help an aspiring angler to learn the steps of the angling, but many of the novels, such as those by Norman Maclean and Don Johnson, do not explicitly explain the difficulty of trout fishing. Guide books help with the understanding of the methods and techniques, and the most important guides contain information on fly patterns. In order to catch trout, you must use a fly that represents what a trout consumes. In addition, this fly must also match the life stage of the aquatic insect at the time you are fishing. The use of entomology, or the scientific study of insects, is crucial for trout fishing, and as I learned this, I had a personal revelation: all trout fishermen are biologists in some form and fashion. Proficient anglers understand the aquatic ecosystem as well as the effects of human interference on the rivers and streams. By understanding the aquatic insects of local rivers, such as the Doe, Watauga, and South Holston, a trout angler can mimic every stage of a macro-invertebrate's life-cycle to catch trout.

Am I using the right fly? This question continues to haunt trout fisherman in southern Appalachia and myself, and although guide books by authors such as Don Kirk focus on both fly patterns and hatches in the Smokies, using the right fly at the right time is critical. While the pattern is important, size is another factor that takes understanding and can make all the difference on the water. A size #12 nymph pattern may catch one rainbow hiding behind a rock, but a smaller size #20 midge with a bead at the front of the hook can catch four in the middle of the river. One pattern on the Watauga River can yield fifteen fish while the same pattern on the South Holston River might not attract any trout.

One weekend during July of 2015, before my first semester of graduate school began, I fished the Watauga River in Elizabethton after reading where the accessible locations were in *Trout Streams of Southern Appalachia* (1994), by Jimmy Jacobs. The stretch of river I chose was very open and had plenty of locations for large trout, both socked rainbow and brown trout (*salmo trutta*). The warm, sunny day had very little trout activity, and I only caught a few small rainbow trout from small midge patterns. I kept hearing rumors from workers at local fly shops of late afternoon caddis fly hatches that can include thousands of hatching bugs and hungry trout. As the day grew darker and cooler, trout began rising to the surface steadily and refused midges and nymph patterns in favor of some unknown insects. Some trout anglers carry small nets to collect subsurface insects to help choose the perfect fly; others seem to have a sixth sense when a hatch is about to happen. Rising trout can indicate that a hatch will occur soon and that the subsurface insects are beginning to mature into adults as they rise to the surface to fly away.

Sudden inspiration flooded into me as I remember reading that “the disturbance a trout makes when it takes a fly on the surface reveals much about what, and how, it is eating,” and I quickly switched to an unweighted emerging caddis pattern (Deeter and Meyers 141). A rising

trout disturbs the water as the fish rises to the water's surface while a hatching insect begins to float to the surface film of the water and leaves a small ripple. The closer the trout is to the surface, the larger the water disturbance. A small rainbow trout swallowed the fly with a quick swipe seconds after the fly hit the water's surface. A second, larger trout took the same fly with ease after I delicately released the smaller fish and recast a few feet in front a rising trout (see figure 2).



Figure 2 - Rainbow Trout from the Watauga River in Elizabethton, Tennessee.

Every cast resulted in eager fish. The sky began to fill up with hundreds of tiny, fluttering insects covering every surface after a few minutes of adjusting my fly choice to the hatch. As the sun set and the remaining light faded away with the flies, the trout slowed and stopped feeding, and while the hatch only lasted half an hour, I netted over thirty trout on one small section of a large river. Moral of the story: through knowledge of the river's aquatic insects and understanding of the water, even a beginner can catch trout while matching flies to the hatch.

Pure Dumb Luck on the South Holston River

I continued to fish primarily on the Watauga River for small rainbow and brown trout during the end of 2015 and early 2016, but my trout rarely exceeded twelve inches in length. The rumors of larger trout on the South Holston were tempting, and shortly after my second semester of graduate school ended, I headed towards the Tennessee-Virginia border to Bristol, Tennessee during April of 2016. Through historian Heidi Altman's *Eastern Cherokee Fishing* (2006), I understood the concept of weir dams as a native fishing practice, and Bob Shanks discusses how these structures helped boost the aquatic insect life, in *Around the Bend* (2012). The weir dams of the South Holston do not reflect the native structures, but they do help promote the aquatic habitat through oxygenation, and as a result, in the river below the weir dams, large trout thrive on very technical water. The definition of technical water for a trout angler is a stretch of river or stream that is heavily fished as well as one that requires precise presentation to easily spooked trout.

In David O'Hara and Matthew Dickerson's book *Downstream* (2014), the South Holston is identified as one of the better managed trout rivers in southern Appalachia, and O'Hara and Dickerson say that it contains brown trout up to forty inches (57). Much like the authors, I was interested in the pursuit of these larger trout, but I did not pay much attention to O'Hara and Dickerson's note on tippet and fly size on technical waters. Through my arrogance after fishing on the Watauga River for a year, I tied on a size #12 bead-head pheasant tail nymph with a smaller, size #20 black zebra midge tied eighteen inches below the top fly on a 5X tippet (see figure 3). The smaller tippet is thinner in diameter and harder to see by the trout, and according to O'Hara and Dickerson, "it is generally the case that smaller flies, clearer water, and warier

trout all require smaller tippetts of size 5X, 6X, or even 7X” (56). On the other hand, smaller tippetts break more easily than a standard 5X, and, after all, I was hunting for big trout.



Figure 3 - Beadhead Pheasant Tail Nymph (Top) and Zebra Midge (Bottom).

On the Holston, I waded out to a secluded section just below the weirs, immediately following the scheduled generation and heavy discharge of water, which kept me from entering the fast-moving water. The water was as smooth as glass and crystal clear. The trout would be very selective on the fly, and the presentation needed to be perfect. After a poor cast, I readjusted upstream and cast about ten yards in front of me, allowing the flies to drift towards me slowly without any drag. When the small, yellow indicator fell below the surface, lifting the rod would help set the small hook in the fish’s jaw; however, the water was not deep enough to support the total length of the two weighted flies and the bottom fly kept hanging up on the riverbed. Although trout anglers agree that the flies need to be near the bottom of the river to catch more trout, the hanging fly caused the indicator to submerge and incorrectly indicate a hooked trout,

and the movement needed for me to unhook the fly disturbed the smooth water spooking nearby fish.

Reconsidering my choice of flies, I cast upstream towards the middle of the river and waited as the drift carried the flies downstream, but again, the indicator slipped below the surface and signaled that the bottom fly was catching the riverbed. However, as I lifted the rod tip to remove the flies from the bottom, the line moved upstream away from me signaling a set hook. Panic filled every bone as I remembered that the second fly was barbless and the trout could shake the fly off with one quick movement. Barbless hooks help ensure a quick and easy release and prevent prolonged exposure to air and stressors to the fish, but without the barb, the trout can more easily escape. Putting added pressure to the line, I moved towards the bank for better footing while the trout began to fight for freedom from the metal hook. As the trout moved closer, I glimpsed the size of a hooked brown trout and saw the barbed size #12 pheasant tail in the side of its mouth, and feeling relieved began easing the trout closer to the net.

Once netted, the brown trout shook its head once and the fly popped out with ease as if it had barely been hooked in at all. Keeping the fish submerged in the net, I moved to the bank of the river to place my rod on dry land to measure the fish and take a picture before releasing it back into the river safely (see figure 4). The fight had lasted only minutes but felt like hours, and the brown measured twenty-two inches, by far the largest trout I have ever caught during my fly-fishing career so far. I released the large brown trout back into the river and breathed to calm

myself from the adrenaline and moved slowly back into the water to continue fishing for another monster trout.



Figure 4 - Brown Trout from the South Holston River near Bristol, Tennessee.

The river became mysteriously quiet and yielded no other monster trout. When I retold the story to other trout anglers, they could not believe that I had caught a twenty-two-inch brown trout on such a large fly and tippet with such poor presentation, and although the picture is proof of the catch, they concluded that the catch was just pure dumb luck. The South Holston River continues to haunt me with its trophy sized trout, and I have yet to catch another exceeding fourteen inches. Maybe the catch *was* just dumb luck.

In Search of the Southern Appalachian Brook Trout (*salvelinus fontinalis*)

To catch wild, mountain brook trout (*salvelinus fontinalis*), you must first go to wild, mountain streams. These streams rarely exceed ten feet from bank to bank and are only about three feet deep with pools with varying depth. Unlike the larger rivers, the smaller, higher elevation streams of the Smokies and the Blue Ridge have an excess of vegetation that hangs low

over the water and the trout spook at the slightest sign of danger. Not only are presentation, fly selection, and casting important to trout fishing for brook trout, but stealth also becomes a critical element. John Gierach explains in *Fly Fishing Small Streams* (1989) that “step one is to keep the trout from seeing you,” and although this statement seems simple, sneaking up on wild trout is difficult when you are trying to cast without catching a stray limb or bush (34). Gierach is an authority where trout fishing is concerned, and mountain stream trout fishing appeared easy through his guidance throughout his literature. Apparently, I was gravely mistaken.

My first brook trout on the fly was as surprising to me as it must have been to the trout with a small hook in its mouth. Taking an impromptu trip to the Great Smoky Mountains National Park during April of 2016, I fished a small section of Rainbow Falls. The small stream is right on a heavily travelled tourist hiking trail, but it rarely sees trout anglers. Through research on the brook trout and National Park restoration projects, I knew both wild brook trout and stocked rainbows could be found in the small stream, but I did not know how to fish for trout on such a small stream. Instead of setting up for the shallow water by using a small dry fly, I tied on two small midges that caught every tree in the forest. After hiking several miles, and as the light was fading, I worked my way down the trail and back to the parking area, but as I passed a deeper section, I decided to make one last cast for anything that would bite. A small, three-inch brook trout quickly took the fly, and the hook-set launched the tiny trout out of the stream and into the net (see figure 5).



Figure 5 - Brook Trout from the Great Smoky Mountains National Park.

Japanese Fly-Fishing in Southern Appalachia

During field research on Briar Creek near Johnson City, Tennessee in June of 2017, I began to understand how rare a wild brook trout is within a small mountain stream. Chapter 5 explains the process and purpose of trout research. In the meantime, trying to catch brook trout while fly-fishing is much more difficult than electroshocking for research purposes. The population of rainbow and brown trout (*salmo trutta*) overrun the brook trout and compete for resources, and although a delicately placed dry fly is easy bait for all three species of trout, the brook trout competes with other hungry fish. During the research, Briar Creek's ratio of rainbow trout to brookies was 2:1, and some days contained zero brook trout present. The strong presence of dominant rainbow trout show how hard brook trout must work to survive in small streams and why the brookies are difficult to catch. Rainbows and brown trout continue to compete with and aid in the decrease of brook trout populations, although the Smokies and the Blue Ridge continue attempts to rehabilitate the southern brook trout during the twenty-first century. The competition

between all three species of trout is one reason that brook trout thrive at higher elevation streams above 3,000 feet.

Trout fishermen that pursue brook trout specifically must adapt to the environment of higher elevations. While a typical fly rod outfit includes a 9 foot 5-weight rod with a 5-weight reel with the corresponding fly line, the thick laurels and tight casting spaces usually require other gear, if you want to present the fly to tough areas. As I myself wrote in an article published in *Tenkara Angler Magazine* in the summer of 2016, “this is when a tenkara rod is the best choice for these rugged mountain streams,” and the use of the tenkara allows for the “ability to high-stick the faster runs” to present a drag-free drift (Skaggs “Mystical Mountainscapes” 90-91). My tenkara rod is a nine-foot telescopic fly rod without a reel, and the fly line attaches to the tip of the rod for better control of the line. Although a conventional fly rod is better for more open water that requires a farther reach, small mountain streams only need a few feet of line but a more accurate placement of a single fly and makes the traditional Japanese method perfect for the Appalachian environment.

My first attempt at trout fishing with a tenkara rod was on the Doe River at Roan Mountain State Park in May of 2016 a month after I hooked the brookie at Rainbow Falls in the Smokies, a wonderful location for wild brook trout. While the rod helped with casting around low hanging limbs and casting to specific locations on the small river, netting a fish quickly became a challenge. Instead of being able to strip in line or reel the line in to net the fish, the angler must set the hook and work the fish at an angle while reaching the net towards the fish and pushing the rod tip in the opposite direction.

The first trout I caught on the new rod was a small wild rainbow that took ten minutes to finally net before I quickly released it back into the water (see figure 6). Gaining a little more

confidence and setting out to find the wild brook trout, I tied on a small sulphur pattern that resembled a small insect hovering just above the water's surface (see figure 7).



Figure 6 - Rainbow Trout from the Doe River in Roan Mountain, Tennessee.



Figure 7 - A male sulphur dun (*ephemerella invaria*).

Using Gierach's method of stealthy approach, I moved slowly and quietly towards a small holding pond just underneath some faster moving water. The first cast landed in the rhododendron behind me, and the second cast became tangled in the weeds on the opposite bank. Each cast was becoming sloppier due to frustration and lack of control. Taking a deep breath, I

flicked the small fly just above a small rock and watched it float downstream. Within seconds, a small brook trout lazily emerged from the riverbed and sipped the fly, barely making the water ripple. I set the hook with uncontained excitement and the wild trout took off up the river before I could contain him in slower water. Unlike the rainbow and brown trout, the brook trout fought more aggressively, but after a short fight, the trout tired out after expending energy. I safely eased the tired brookie into the water once netted and the hook removed, and I watched him disappear back into the clear water. A month later, in June 2016, during electroshocking research that I was doing for a biology course, the same area yielded zero brook trout. A ghost in the mountain stream.

Becoming a Trout Instructor

In August of 2016, my last year as a graduate student, I had the opportunity to become a Seasonal Interpretive Ranger (SIR), or intern, at Rocky Fork State Park, one of Tennessee's newest State Parks. Through the internship, I helped put together interpretive programs for visitors and teach them about wildlife conservation. For my final two programs as an SIR, I created new programs that focused on an introduction to fly-fishing small mountain streams and the uses of dry flies on these streams. The program allowed me to use personal fishing experiences to actively provide participants with the knowledge of fly-fishing for wild trout, as well as to promote the park's principles on conservation and preservation. The Park Rangers ordered three beginner fly rods for participants and I hand-tied, or made, five flies unique for Rocky Fork Creek for each individual participant (see figure 8).



Figure 8 - Rocky Fork State Park Flies.

The park's location borders Tennessee and western North Carolina between the edges of the Smokies and the Blue Ridge, and through the help of Don Kirk's guide *Hatches and Fly Patterns of the Great Smoky Mountains*, I could identify the insects and patterns needed for the program. I fished sections of Rocky Fork Creek during the weeks leading up to the program to understand where the trout were and which flies to use during the program and felt confident that my results would allow the participants to catch a few trout each.

I stood in the middle of Rocky Fork Creek on a cool Saturday in October and began the program with the history of the park and the importance of its purchase from the state for the watershed. In my explanation of the trout located in the creek, I explained that the Tennessee Wildlife Resources Agency (TWRA) stocks portions of the creek below the park gate entrance, and that they conduct electroshocking research throughout the park. While explaining TWRA's role in Rocky Fork State Park to my three participants, I explained that most of the brook trout in the watershed are found in the higher elevations above 3,000 feet and that the program that I was leading that day focuses on rainbow trout because our location was at 2,200 feet in elevation. Once I explained the purpose of the program to the participants, I began to demonstrate casting

techniques for small mountain streams and how to navigate the creek without disrupting the habitat. Unfortunately, the water level for Rocky Fork Creek was below average and required the program to focus on the use of dry flies, or flies that float on the surface of the water, until we reached the deeper pools of water. As I mention in an article in the Fall 2016 issue of *Tenkara Angler Magazine*, “Rocky Fork State Park proves to hold both eager rainbows and a wise older trout that require delicate presentations and realistic flies” (Skaggs “Where the Water Forks” 84). The older and more intelligent trout in the creek are able to spot the difference between artificial flies and the real insect by how well the fly lands on the water’s surface and how well the fly is tied.

As we continued to move up the creek and farther into the park, I explained methods of conservation and preservation of trout waters and the roles that Rocky Fork take to keep the creeks clean. In response to questions about small stream fishing techniques, I discussed the importance of learning about the local waterways as well as the local aquatic insects to help with the fly selection. Many of the questions focused on the principles of technique as well as the use of certain flies for certain locations along Rocky Fork Creek. I answered, “mountain trout respond better to a delicate presentation as well as the correct imitation of whatever insect the trout is feeding on,” and I utilized designated stops along the creek to physically demonstrate my answers to their questions. The participants expressed further interest in how to help restore the brook trout populations as well as to protect the habitat after the program concluded at sunset, and everyone enjoyed learning about trout fishing on small mountain streams, even though I was the only one to catch a small brook trout (see figure 9). The program at Rocky Fork State Park allowed me to educate both new and experienced trout anglers and prevent participants from making the same mistakes that I made when I first began fly-fishing in southern Appalachia.



Figure 9 - Brook Trout from Rocky Fork State Park in Flag Pond, Tennessee.

CHAPTER 3

THE RIVER'S PAST: THE HISTORY OF TROUT FISHING IN THE SMOKIES AND THE BLUE RIDGE

Native Trout Fishing Practices of the Eastern Band of the Cherokee

Trout fishing in the Smokies and the Blue Ridge has not always used the technique of rod and reel with the use of artificial flies. The Native Americans had different methods to catch trout and other fish species. Trout was eaten by the Eastern Cherokee Indians that inhabited eastern Tennessee and western North Carolina. Cherokee villages were located close to rivers and streams, and in Heidi Altman's *Eastern Cherokee Fishing* (2006), Altman mentions that travelers such as James Adair and Henry Timberlake during the 1770s noticed the close proximity of Cherokee towns to the rivers and the large quantity of fish inhabiting these waterways (Altman 19-20). Timberlake's travels through the Holston and Tennessee Rivers in 1767 highlights how the Cherokee aided in the navigation of rivers and streams of the region and explained how to read the water currents and warn travelers of dangerous sections of rivers.

The relationship between European-Americans and the Cherokee progressed the evolution of trout fishing practices in the Smokies and the Blue Ridge. Through the eighteenth and most of the nineteenth century, Cherokee fishing practices included the harvesting of a large amount of fish, not just trout, and required methods, such as weirs and large nets, that would help feed most of the town or produce a quantity for trade. The sport of angling would not support such large catches. One important factor to consider with the Cherokee fishing practices and fish diet is that "when people fish for subsistence, they prefer fish that provide the greatest nutritional value" (Altman 58). While trout contain nutritional value for the Cherokee, Altman points out

that both rainbow trout (*oncorhynchus mykiss*) and brown trout (*salmo trutta*) were only recently added to the area, and the brook trout (*salvelinus fontinalis*) was the only native trout species in the Smokies and the Blue Ridge. The fish species consumed by the Eastern Cherokee were more than likely several species of minnow, redhorse, and sucker during periods of spawning when the larger fish become more active. On the other hand, Smokies historian Margaret Brown points out in *The Wild East* (2001), that during the early 1900s “most mountain people supplemented the family diet with ‘speckled trout’ (native brook trout) caught closer to home” instead of travelling to higher elevation streams (Brown 16). Brown’s statement suggests that although the Cherokee consumed a variety of fish, southern Appalachian families living in the mountains consumed brook trout more for food than the Cherokee.

Altman describes several methods and tools used by the Cherokee that later Americans would adopt during trout angling. One of these methods was the Cherokee use of stone weirs to dam up rivers and streams. To use the weirs properly, Cherokee fishermen would start upstream with a large net and push fish towards the funneled mouth of the weir. Then the other members of the Cherokee community would collect the fish downstream as fish came through the mouth of the weirs. The remains of stone weir structures provide evidence of Cherokee influence, but Altman explains that “they [weir dams] are no longer used for fishing” as they obstructed the waterways for boat traffic during the late 1880s (Altman 40-42). In Bob Shanks’s trout angling memoir *Around the Next Bend* (2012), Shanks points out that these stone weirs actually are good news for trout fishing, and says “these weirs provided man-made shoals, which aerated the flowing water and provided a concentration of aquatic insects” (Shanks 21). The increase in aquatic insects helps boost the trout’s diet and promotes healthy fish.

Another method for fishing by the Cherokee was the use of natural plants to poison fish on a large scale. The use of natural plants allowed the Cherokee to harvest most of the fish surrounding the area poisoned, and multiple applications of fish poisoning damages the balance of the ecosystem. Governmental regulations outlawed these dangerous methods of fishing in order to protect the aquatic habitat. As Brown points out that “both Tennessee and North Carolina outlawed the ancient practice of poisoning the water with pounded walnut bark or buckeye to catch fish” and indicates a decrease in the older practices beginning in the late 1880s (Brown 16).

Cherokee knowledge helped early European settlers in the eighteenth-century to gain access to and knowledge of the waterways in southern Appalachia. European-Americans learned from the Cherokee how to understand the signs of fishing and the habitat. Altman points out that these fishing signs refer to “cues from the seasons of the year, the environment, lunar cycles, weather, and even the time of day,” and through these signs, rod and reel anglers learn the best times to fish (Altman 78). Native Cherokee practices used materials primarily at hand, and Altman suggests one form of hook-and-line method used materials such as strung horse hair for line and sharpened bones for hooks (Altman 55-56). Ian Whitlaw mentions in *The History of Fly-Fishing in Fifty Flies* (2015) that “at the start of the 1800s, rods were still being made from hardwoods such as ash, hickory, and hazel,” and then began to transition into the use of split cane for more durable rods (Whitlaw 80). During the first half of the nineteenth century, America imported most of the used fishing gear, but then began to produce and improve the British equipment (Whitlaw 80). By 1880, the split-cane rod and newly manufactured fly reels dominated American angling, and Cherokee practices transitioned more towards hook-and-line angling with the use of rod and reel.

The study of entomology, or scientific study of insects, and the local environment is a crucial aspect to the evolution of trout fishing and its methods. As I discussed in Chapter 2, by understanding the specific insects located in an around the waterways, an angler can imitate the insect, or food source, for the fish. Altman describes how Cherokee anglers in the early twentieth century understood local entomology. However, “it is not clear whether these particular aspects of the local environmental knowledge are traditional or derived from the Euro-American fly-fishing culture,” because “fly fishermen are well aware of the hatching times of various flies and insects” (Altman 79). Because fly-fishing is a more recent addition to the Cherokee population during the twentieth century, the younger generation of Cherokee anglers, according to Altman, have a better understanding of the local entomology due to an increase in fly-fishing in America during the twentieth century (Altman 79). The relationship between the younger generation of Cherokee anglers and the Anglo-American fishing tradition indicates a transition from native practices to a more regulated method of sport fishing through contact with European-American anglers.

While Altman points out the natives did not focus on European trout fishing methods, Brown suggests the mountain people of the Smokies had some influence on the Cherokee through the use of the hook-and-line by stating that “Cherokees found this hook-and-line method useful, but some added the old formulas” (Brown 16). Brown provides an example of the Cherokee’s old formula of adding feather material to suggest early imitations the local entomology, and through a description of a mountaineer that used a stripped sapling, string, and a safety pin for a hook, the method would resemble the modern day tenkara rod, or rod that does not use a reel (Brown 16). Brown’s indication of the Euro-American influence on the Cherokee also correlates with Altman’s analysis of the younger generation of Cherokee fly fisherman and

their environmental knowledge by stating that the “younger generation of Cherokee fly fishermen sometimes knows the science of fly-fishing but not the traditional ideas about fish and the environment” (Altman 79).

The writings of Horace Kephart during his time and travels in the Smokies in the early 1900s, in comparison to Brown’s observations, describe the southern mountaineers as resourceful with fishing practices. Southern mountaineer literature, however, does not suggest a focus on trout fishing methods, and the mention of fishing focuses on catching fish for food rather than sport. Horace Kephart suggests in *Camping and Woodcraft* (2011) that trout fishing was present during his stay at Deep Creek in the Great Smoky Mountains National Park in the 1920s.

According to Don Kirk in *Hatches and Fly Patterns of the Great Smoky Patterns* (2014), Kephart was an avid fly angler and fished for trout while residing in Deep Creek (Kirk 35). Horace Kephart joined two, native North Carolina anglers, Samuel Hunnicutt and Mark Cathey, through the 1920s on trout fishing trips up Deep Creek (Kirk and Ward 31). Heidi Altman and Smokies historian, Margaret Brown both indicate a transition of sport fishing in southern Appalachia during the early 1930s, after the creation of the Great Smoky Mountains National Park (Brown 117). Southern mountaineer literature, on the other hand, does not provide a clear distinction on the dates that mountain families transitioned from fishing local creeks for food to sport fishing for fun.

Appalachian Forests: The National Forest and National Park

The timber industry during the end of the nineteenth century destroyed the forests in the Great Smoky Mountains and the Blue Ridge Mountains. It also destroyed thousands of miles of

Appalachian trout streams. According to environmental historian Don Davis in *Where There Are Mountains* (2005), “land speculation escalated to new heights in the southern Appalachians after the Civil War,” and industrialists began entering into the Smokies and the Blue Ridge by the 1880s (Davis 163). The mid-1880s witnessed an increase in industrial logging due to the railroads entering the southern Appalachian Mountains. Land purchases increased as investors convinced land owners in the Great Smoky Mountains and western North Carolina to sell property at a low price due to the hilly Appalachian Mountains. The timber industry first began along large rivers before railroad companies pushed further into the interior of the mountains and used large log rafts to float logs downstream to sawmills (Davis 166). The large amount of timber in 1870s came from thousands of acres of forest in eastern Kentucky via the Cumberland River in Nashville (Davis 166). By 1890, timber companies began buying large tracts of land in western North Carolina to support booming mill operations.

Davis points out that “the increasing environmental destruction was due not only to the mere cutting of tree but also to the use of new and more technologically efficient logging methods” that did not require logging locations close to larger waterways (Davis 168). The clear-cutting of the forests and moving fallen timber to the railroads created problems with fires, flooding, and soil erosion from the scalped ground. In 1892, Gifford Pinchot managed a 100,000-acre tract near George W. Vanderbilt’s Biltmore Estate in Asheville, North Carolina; through his expertise, Pinchot helped to cultivate new practices to manage the wastefulness of southern Appalachian lumber companies and mentions that the abandoned lands could be properly managed “to yield new harvest of wood for future generations” (Williams 289-290). This new harvest could help prevent flooding and protect headwaters of rivers. By 1900, the timber industry continued to boom financially while southern Appalachians communities affected by

excessive logging began to push for better lumber harvesting practices. At the height of the lumber industry in 1907, an employee of the United States Forest Service under the Department of Agriculture, R.S. Kellogg, wrote about the importance of forestry regulation to ensure a possible future of timber harvesting (Davis 170). As a result of Kellogg's writing and continued complaints from specialists, Congress passed the Weeks Act of 1911 in order to purchase timbered lands close to waterways in an attempt to regulate water flow (Davis 171). Historian, John Alexander Williams, writes in *Appalachia: A History* (2002), "the principles of scientific forestry were established by the Weeks Act, which authorized the federal purchase of both forested and cutover lands in the name of watershed protection," and in 1916, President Woodrow Wilson established Pisgah National Forest in North Carolina, Appalachia's first national forest (Williams 290).

Through the Weeks Act of 1911, the National Forest Service regulated timber harvesting for future uses instead of abolishing the practice completely. The National Park Service (NPS) under the U.S. Department of Interior, on the other hand, promoted the preservation of forests for tourism, heritage, and recreation during the 1920s (Brown 87). By 1925 and 1926, talk had begun to create the new Great Smoky Mountain National Park in east Tennessee and western North Carolina, while conservationists from the National Park Service fought the National Forest Service for lands used for harvesting timber. Environmentalists cheered on the creation of the National Park under the Department of the Interior while remaining skeptical of the United States Forest Service's continued mission to clear-cut the forests of southern Appalachia under the auspices of the Department of Agriculture. According to Appalachian historian, Richard Drake, "the conservation movement in America owes much to the developments in the Appalachian South" (Drake 138). Conservationists, such as Horace Kephart, were important to

the future of Appalachian forests, and Drake refers to Kephart as “one of the fathers of the Great Smoky Mountains Park and the Appalachian Trail,” and the early conservation movement promoted the “proper use of the beautiful Appalachian area” (Drake 138). Early twentieth century conservationists realized the destruction of the forests and rivers in the Great Smoky Mountains National Park, and Smokies historian, Margaret Brown, mentions that “before corporate logging devastated the streams, brook trout thrived in nearly every stream above 2,000 feet in elevation” (185).

The continued promotion of forestry regulations by conservationists and environmentalists helped to create the Tennessee Valley Authority (TVA) in the 1930s through New Deal agencies. Williams explains that the TVA had similar beliefs as the Forest Service and “was rooted in progressive concern over the efficient use of natural resources, in this case water power from the nation’s rivers” (Williams 291). By 1933, the TVA promised the rural people of southern Appalachia that hydroelectric dams would provide electricity and industrial development while including forestry practices to grow new trees and prevent soil erosion (Williams 294-295). The TVA constructed the Norris Dam in 1936 in order to improve “navigation and flood control along the Tennessee River,” as well as to generate hydroelectric power during the beginning of World War II (Brown 146).

The reason the TVA emphasized flood control and pushed for early damming projects was in part the result of extreme logging in the Smokies that caused flooding. By 1945, TVA’s damming projects began affecting both the people and the environment in the Great Smoky Mountains. The creation of Fontana Lake in 1945 “wiped out the terrestrial population – an estimated 1,500 organisms in each square meter of land,” but the decaying vegetation in the new lake “caused a temporary boost to certain fish populations” (Brown 165). Bass populations

skyrocketed while mirror shiners (*notropis spectrunculus*) and blueside darters (*etheostoma jessiae*) died off due to loss of river habitat (Brown 166). During the damming of the Little Tennessee River, Brown states that, while “the river supported seventy to ninety species of native fishes, only fifteen or twenty adapted to the reservoir” (Brown 165-166). Species such as the sturgeon and paddlefish began to disappear from the area of Fontana Dam in the 1940s. Fish that require fast-moving rivers, such as the Little Tennessee River, that are cold and have gravel beds cannot survive in warmer, impounded lakes or stabilize a sustainable population.

Although the National Parks and National Forests helped reduce the amount of commercial logging and industry within the boundaries, the creation of the Tennessee Valley Authority helped add to the problem of lost fisheries habitat in lower valleys. Donald Davis explains that “the building of dams by the federal government and private industry altered miles of southern Appalachian rivers and streams” which contributed to the destruction of biotic ecosystem (212). Much like Davis, Brown also indicates that the construction of hydroelectric dams destroyed ecological habitat during the 1930s. The building of dams by the TVA, on the other hand, did create tailwaters downstream from the dams. The hydroelectric generations, or the discharge of water from the bottom of the reservoir, helps create a cold current that can sustain stocked rainbow and brown trout populations.

CHAPTER 4

THE SPORT OF FLY-FISHING: EXAMINING THE HISTORY AND GROWTH OF FLY-FISHING

The Growth of Fly-Fishing in Southern Appalachia: British Influence and American Innovation

The sport of fly-fishing is predominantly an eastern European practice dating back to the fifteenth-century that included countries such as present-day Ireland, Scotland, the United Kingdom, and Germany. Trout fishing in the Smokies and the Blue Ridge subsequently shows signs of American adaptation during the end of the nineteenth century and well into the twentieth century. During the late nineteenth century, the use of weir dams and fish poisoning by the Cherokee was replaced by sport fishing. Angling through fly-fishing, rather than to provide food, became the main association with trout fishing in the United States (Altman 79).

The use of environmental knowledge by an angler is crucial to understanding artificial flies and their imitations of insects. The study of specific insects is important to the creation of an artificial fly that will convince a trout to take the bait. Ian Whitlaw points out in his study *The History of Fly-Fish*:

The term “artificial fly” was already being used in the 16th century to include caterpillars and worms, and over the intervening years it has been applied to larvae, nymphs, leaches, baitfish, frogs and, in the case of carp flies, even berries and seeds, so it clearly doesn’t just mean a representation of a flying insect. (Whitlaw 6)

The artificial fly predates the colonization of America as well as many of the native practices examined by Altman. The artificial fly comes from England and was first widely used during the late 1500s to increase chances of catching fish for sport. Artificial flies have a more specific

purpose than the use of large nets or weir dams by focusing on one imitation to attract one fish at a time.

Adapting European Flies for American Waters in the 1900s

Whitlaw explores the European influence of American trout fishing with artificial flies by examining fifty distinct flies and their histories, as well as the adaptations of the flies as they arrived into America. The earliest documented list of artificial flies is from the 15th century in England. By the nineteenth century, one of the first flies widely adapted as American was the Royal Coachman (see figure 10).



Figure 10 - Coachman

As the name suggests, this fly has an English history. The original Coachman, as distinct from the later adaptation which came to be known as “the Royal Coachman,” was created in the 1830s as a wet fly and a streamer pattern, and Whitlaw states that the Royal Coachman’s “history throws light on the kinds of transformations that took place when British flies came to America” (53). The American version of the Coachman appears to have been created in 1878 in

New York City, but transformed into a dry fly rather than a wet fly (see figure 11). By 1892, the Royal Coachman was one of America's top used artificial flies (Whitlaw 53).



Figure 11 - Royal Coachman

Why do European flies undergo transformations and adaptations when they arrive in America? To answer this question, we must return to the study of entomology and of the local environment. Through imitations of insects, a trout angler can more accurately catch fish than by using other bait. By understanding the life cycles of aquatic insects, the angler can then use a fly that successfully imitates the current stage of life that the trout is feeding on. However, the studied insects from England, Scotland, and Ireland, the three countries that majorly influenced the North American fly-fishing movement, are different and require different methods of imitation.

According to the daughter of Charles F. Orvis, owner of the Orvis Company, Mary Orvis Marbury's collected study, *Favorite Flies and Their Histories* (1988), "in Great Britain over two hundred species [of insects] have been identified, but in North America they have not been fully studied" during the eighteenth century when the book was first published (Marbury 19). Marbury discusses how an artificial fly used on a European river may not work as effectively an American

river, because it may not resemble an American insect. Without the full understanding of the local aquatic insects, American fly fishermen need to adapt European flies for both the American insects and the aquatic habitat within waterways. Whitlaw, too, indicates the difference in aquatic insects between Europe and America by saying “European aquatic insect life is significantly different from that of North America,” and by understanding this difference, we begin to understand matching the hatch (Whitlaw 74).

Other European influences on American fly-fishing include flies that reflect good imitations of certain insects and do not need adaptations. Whitlaw gives the example of the Little Marryat, a dry fly tied by George Selwyn Marryat in Hampshire, England around 1876. This fly, as Whitlaw explains, is a good imitation of pale mayflies and resembles two species of mayflies in America (Whitlaw 59). While England, Ireland, and Scotland influenced the majority of American fly-fishing, Theodore Gordon, an American, helped spread his influence to these European waters in the late 1892 with his creation of the Quill Gordon (see figure 12). According to Whitlaw, Gordon is considered to be the “father of dry fly angling in the USA” and seemed “to have an impact on the English dry fly scene, too” (73). Gordon’s dry fly influence in countries such as Ireland, Scotlans, England, and even Germany, during the late nineteenth century helped Europeans create more realistic artificial flies to attract trout responding to hatching adult insects.



Figure 12 - Quill Gordon

The innovation of the American dry fly by Theodore Gordon indicates a transition in fishing techniques from wet flies to floating, dry flies to catch brook trout in the Catskill Mountains of New York in 1892. Gordon wrote a letter to Fredrick Halford, an English trout angler, requesting advice for fly patterns to attract brook trout. Gordon received a selection of 48 dry flies that Halford used on English streams (Whitlaw 73-74). The importance of the Quill Gordon in American trout fishing in comparison with Halford's selection is the transition from the American wet flies to the newer dry flies to accurately mimic insects floating on the water's surface.

The differences between the uses of both dry and wet flies as well as nymphs are easy to understand to the modern angler, but these differences in fly selection result from the study and observation of entomology to accurately imitate an insect. Aquatic insects are the main source of nutrients to trout and have specific life cycles that include both aquatic stages and stages as an adult where they thrive outside of the water. Nymphs and midges represent the earliest forms of aquatic life with midges representing the earliest stage and nymphs representing maturing stages.

Wet flies represent the more mature stages of an insect as it begins to hatch and shed the exoskeletons for mature wings. The “old formula” that Brown mentions in her study of early twentieth century fishing in the Smokies uses feather materials wrapped around a safety pin (Brown 16). The use of the feather helps imitate a maturing, or emerging, insect. Both nymphs and midges are wet flies representing the stages of aquatic life beneath the water’s surface, and dry flies represent the final adult stages of the insect. Dry flies also can mimic terrestrial insects such as grasshoppers, ants, and beetles that can fall into the stream and river.

With the Quill Gordon, Gordon helped create the American dry fly movement that focused on flies that floated on the surface rather than along the riverbed. Through Gordon’s influence, American anglers began to tie their own dry flies in the 1900s to imitate local insects. But what does this dry fly movement and transition away from wet flies have to do with trout fishing in the Smokies and the Blue Ridge? Gordon’s observation of fly-fishing in the Catskills and his letter to Fredrick Halford caused a creation of American dry flies that targeted native brook trout, and Gordon’s dry fly seems to have migrated to both the Great Smoky Mountains and the Blue Ridge during the early twentieth century based on Don Kirk’s description of the Quill Gordon in *Hatches and Fly Patterns of the Great Smoky Mountains* (2014) (Kirk 199).

However, Whitlaw continues to explain another reason for continued American innovations with fly representation by stating that “the initial development of the fly tying tradition in the USA took place largely to adapt British patterns to represent North American insects,” and helped American anglers understand the reason for learning the local entomology to imitate specific aquatic insects (Whitlaw 109). The development of the American fly tying tradition answers the question of importance to fly-fishing history in the Smokies and the Blue Ridge through the American fly variations and adaptations during the twentieth century.

American fly-fishing innovation began during the end of the nineteenth century with the adaptation of European flies, but by the twentieth century, the American flies began to spread throughout the country.

Flies of the Smokies and the Blue Ridge

Ian Whitlaw's study on fifty flies and their histories helps date fly-fishing's famous fly patterns and their dates of creation, but Whitlaw only includes one fly from Tennessee. In 1915, Ernest Peckinpaugh created the bass popper to target bass in middle Tennessee because the rivers are warmer than the rivers and streams in the Smokies and the Blue Ridge. Whitlaw indicates that Peckinpaugh's bass popper helped open up early fly-fishing in warmer lakes and river until the 1960s when spinners and spinning rods came to dominate the bass fishing scene, but the 1915 fly from Tennessee did not target trout in colder streams of southern Appalachia (Whitlaw 99-100). Don Kirk's *Hatches and Fly Patterns of the Great Smoky Mountains* (2014) examines the flies used in the Smokies and the Blue Ridge as well as the specific variations of American flies.

American fly patterns such as the Quill Gordon, the Royal Coachman, and the Elk Hair Caddis all have a history of adaptation in the northern United States, but as these flies moved south, anglers began to tie their own variations to catch more trout. The twenty-first century adaptation of the Quill Gordon that Kirk provides uses "significantly more robust hackling than you'd find on the more traditionally tied versions from the New York's Catskill Mountains" (Kirk 199). The increase in hackle feathers, or the wing feathers of a rooster, helps keep the fly floating on the rougher streams of the Smokies and the Blue Ridge. Kirk's adaptation of the Quill Gordon has only a small variation to increase buoyancy.

The Royal Coachman is another example of a traditional fly pattern that has a southern Appalachian variation. Whitlaw shows that the Royal Coachman went through a transition from wet fly to dry fly in 1930 by Q.L. Quackenbush to combine the Coachman's pattern with Lee Wulff's hair-wing pattern, and the new variation became the Royal Wulff (see figure 13) (Whitlaw 55), a fly used in the Catskills. Kirk identifies two variations of the Royal Wulff specific to east Tennessee and western North Carolina. The first variation of the southern Appalachian Royal Wulff is the Tennessee Wulff that entered the Smokies during the 1970s, and the primary difference is the bright green band wrapped around the middle of the fly rather than the traditional red (Kirk 130). A more recent variation is the Carolina Wulff with a yellow band, but Kirk points out that "no one has laid claim to parenting the Carolina Wulff" (Kirk 129). The only difference between the Royal Wulff and the two southern Appalachian variations is the color of the band, and your choice of fly depends on the preference of the fish and the hatching insects (see figure 14).



Figure 13 - Royal Wulff



Figure 14 - Tennessee Wulff (Top) and Carolina Wulff (Bottom)

Another pattern that has unique variations is the Elk Hair Caddis that was created in 1957 in Pennsylvania and is a favorite in the Great Smoky Mountains. The differences between Whitlaw and Kirk's example of the Elk Hair Caddis are the color of dubbing material, and the use of elk hair. I have found that a personal variation catches more trout during caddis hatches, and instead of using the traditional materials, I use CDC feathers rather than elk hair and a chenille wrap to replace the dubbing (see figure 15). The personal variation does not resemble the traditional fly, but mimics both the hatching caddisfly and the adult form.



Figure 15 - Elk Hair Caddis (Left) and Elk Hair Caddis Variation (Right)

Other Smokies and Blue Ridge flies are original patterns that the local fly tiers use for trout. Kirk uses the Fore & After and the Hazel Creek flies as examples of flies that originated from southern Appalachia to catch trout in the Great Smoky National Park (see figure 16). Kirk points out that the Fore & After fly is rarely seen outside of southern Appalachia and originates from western North Carolina, but the Hazel Creek fly originated from the Great Smoky Mountains National Park, and is named after Hazel Creek on the North Carolina side of the Smokies (Kirk 152-153). These two flies are unique to southern Appalachia.



Figure 16 - Hazel Creek (Top) and Fore & After (Bottom)

CHAPTER 5

EXPLORING THE WILDERNESS: ANALYZING THE HABITAT AND ECOLOGY OF TROUT

The Rise of Rainbow Trout (*oncorhynchus mykiss*) in Appalachia in the 20th Century

The importance of trout fishing in southern Appalachia is the relationship between the native brook trout and the non-native, introduced rainbow trout and brown trout, and this interspecies-relationship is a crucial factor to understanding twentieth century fishing practices and the progression of trout fishing. An increase in trout fishing interest throughout America was a response to the destruction of thousands of miles of trout streams in Appalachia and resulted in the introduction of non-native species of trout into the waterways of the Smokies and the Blue Ridge during the early twentieth century. Whitlaw points out a shocking fact that due to “the gradual decline in the brook trout population in the eastern United States because of pressure from over-fishing and habitat changes, brown trout had been introduced to Eastern streams from Europe” (73). In Turn, Anders Halverson provides an in-depth examination of the emergence of rainbow trout throughout the country and its changes to trout fishing during the twentieth century through hatchery raised fish in *An Entirely Synthetic Fish* (2010).

During the late 1850s, George Perkins Marsh began to advocate for American conservation movements and restricting industries that damage the environment. Although Marsh wanted to limit industry and protect the lands for hunting and fishing, he also proposed the option of fish culture to fix the decline in fish populations. Fish culture is the process of raising fish by forcing the eggs out of a spawning female and using the male’s sperm to fertilize

the eggs. Once the eggs are fertilized, the eggs are then placed in a simulated environment to reflect river conditions to raise and to mature the fish.

The process that Marsh conducted in New England during 1872 was the earliest form of hatchery raised fish. The practice continues today. Marsh imagined the drastic increase in destruction of lands through the twenty-first century, and by the 1900s, Halverson points out that, “the only problem was that the pollution, logging, and intensive agriculture that Marsh had described in 1857 had only intensified in the years since that time” (Halverson 13). The destruction caused by extractive industry and agriculture clear-cutting of the natural forests eroded the mountains streams. The process of fish culture could increase the population of fish in certain areas, but one problem arises with that method: why introduce non-native species of fish into foreign waterways? One answer is environmental destruction and the need to repopulate the rivers and streams.

However, Halverson points out a reason to introduce non-native species of fish that predates the uses of hatcheries. Halverson explains that the movement of fish culture, or the process of raising non-native fish in hatcheries and then stocking them in new waterways, compares to European colonization and the desire to remove various species of flora and fauna and introduce them into a new environment (28). Although the new environment is similar to the native environment, the non-native rainbow trout became an exotic addition to a new region. The rainbow trout is native to the western United States along the Pacific Ocean from northern California to southwestern Canada, but was introduced to the eastern part of the country during the 1880s as a response to the continued destruction of the eastern brook trout. California also began to introduce the eastern brook trout during the rainbow trout’s introduction in the eastern United States (Halverson 31). While the importation of the brook trout into California was the

result of sportsmen wanting a return of brook trout into their waters, the introduction of the rainbow trout into east was meant to help maintain populations of trout into eastern waterways due to a drastic loss due to destruction. Halverson also mentions that “brown trout from Germany and Scotland...were being introduced to the eastern United States about the same time as the rainbows,” but the focus was on rainbow and brook trout during the 1880s rather than brown trout (Halverson 73).

As I discussed in Chapter 3, during the turn of the century, the increase in extractive industry caused the destruction of wild trout streams. As the eastern brook trout is the only native trout species to the Smokies and the Blue Ridge, the promise of fish culture and trout stocking helped generate enthusiasm for population recovery. However, Brown also mentions that western tourists came to expect the Great Smoky Mountain brook trout fishing experience, but due to loss of brook trout population, stocking was the one of the remedies to increase trout populations (184).

Appalachia’s Native Trout: The Brook Trout (*salvelinus fontinalis*)

A large factor to the importance of trout fishing in the Smokies and the Blue Ridge is native brook trout. This species of trout is the face of fly-fishing in southern Appalachia. The brook trout’s popularity during the twentieth century relates to its drastic decrease in population and loss of habitat. By the 1930s, few brook trout inhabited the streams of western North Carolina below 3,000 feet elevation (Karas 321). The destruction from the lumber industry caused the brook trout to migrate to the higher headwaters. Back in the 1990s in Tennessee, brook trout populate “only twenty to thirty percent of pre-1900 distribution,” and “are confined to 170 miles on 135 streams in eight eastern counties” (Karas 326).

The decrease in brook trout population led to an increase in stocking hatchery raised rainbow, brown, and brook trout in addition to a push for stream rehabilitation and environmental activism in southern Appalachia to restore brook trout populations. Karas states that “from 1935-1975, 800,000 hatchery raised brook trout were stocked in the Great Smoky Mountains National Park” from New York hatcheries (Karas 321). However, the continued stocking of the rainbow trout also created problems for the brook trout, and as rainbow trout stocking increased in the Smokies and the Blue Ridge, the population of the brook trout began to decline. Brown indicates that the introduction of rainbow trout into the Smokies “came with the fisherman who demanded stream improvement after logging operations,” but those same fishermen found that the newly adapted rainbows quickly “dominated the creeks” and resulted in the retreat of the brook trout to higher elevations (Brown 86-87).

This decrease in population can be associated with the resilience of the rainbow trout. Rainbow trout can survive warmer water temperatures, and they grow faster within the hatcheries than wild trout (Halverson 59). By surviving in warmer waters, the rainbow trout can take advantage of an entire stream or river without having to stay within colder waters above a certain elevation. Not only does the rainbow trout have an advantage over the brook trout, but hatchery raised fish lack many of the necessary skills that a wild trout may have. In other words, the hatchery raised rainbows compete with the wild brookies for both habitat and food resources but do not have the same senses of danger as the wild fish. Halverson states that this is a big difference between hatchery fish and wild fish. “Hatchery fish lack any sense of etiquette” and this leads to an increase in stocked fish picking fights with wild fish (121). By introducing the hatchery raised rainbow trout into a native, wild brook trout population, fisheries managers increase stress for the brook trout.

Nick Karas gives evidence in his study *Brook Trout* that while hatchery raised rainbows were successful, the early attempts at using wild brookies for culturing and stocking during the late 1800s resulted in disease and death (87). The failed attempt to raise the brook trout in hatcheries due to disease during the 1800s, in contrast to the rapid growth in the stocking of rainbows, continued the decline in brook trout numbers until later attempts of raising brookies in the 1900s. Karas says that the continued study of the relationship between both the rainbow and brook trout in 1983 “concluded that the rainbow trout were the current cause of the brook trout’s shrinking range in the Great Smoky Mountains National Park” (90). However, the studies that Karas refers to were completed during the late 1980s, well after the establishment of the National Park.

Brown suggests another factor to the declining populations during the 1920s. The establishment of the Great Smoky Mountain National Park and the National Forest Service helped minimize deforestation and clearcutting within the park boundaries as well as protect the wildlife and resources. On the other hand, Brown points out during the early 1930s that “every year, the numbers of anglers grew,” and although trout fishing in the Smokies increased due to the stocking of rainbow trout through the 1920s, the brook trout population “declined another 15 percent” due to the increase in anglers by the 1950s (186). Brown mentions that after Smokies regulations in 1933 limited anglers to twenty fish per day with a six-inch minimum for brook trout and a seven-inch minimum for rainbow trout; by 1936, 300 anglers caught the new limit of ten trout (Brown 117).

The brook trout is the image of southern Appalachia and the only native trout to the Smokies and the Blue Ridge. Heidi Altman even points out that one image of “traditional [Cherokee] identity is a picture of a mountain brook trout” and implies the significance of the

fish to people of southern Appalachia (Altman 94). While the Great Smoky Mountain National Park helped increase trout fishing, trout restoration, and decrease in commercial logging, western North Carolina also began to increase its role in environmental activism to protect both the forests and the waterways. In *Blue Ridge Commons* (2012), Kathryn Newfont examines the role of environmental activism in western North Carolina. Her definition of fishing commons and the relationship between the people and the land help explain the importance of trout fishing in the Blue Ridge. The natural-resource commons that are crucial through Newfont's analysis includes "not only elements of the natural world...but also the human activities involved in harvesting these elements" (Newfont 19). Newfont explains how the definition of fish and game as a wilderness commons helps environmental activists to passionately defend the forest commons in western North Carolina.

During the 1930s, the Black Mountains in North Carolina received a boost in both fishing and stocking. In Timothy Silver's *Mount Mitchell and the Black Mountains* (2003), wildlife management proved to have a positive effect for trout fishing and an increase in brook trout populations. Silver mentions that the construction of the Neals Creek hatchery in 1934 helped produce over 300,000 fingerling trout, both rainbow and brook, to the waterways of the Black Mountains (Silver 195). The increase in hatchery raised fish boosted the numbers of trout in the streams of the Black Mountains and promoted recreational fishing through 1940. Although Karas mentions that hatchery raised brook trout often died due to disease in the 1880s, Silver indicates that hatchery raised brook trout were released into the tributaries of the Black Mountains while the rainbows were released into the warmer waters of the South Toe (195).

On the other hand, other problems began to increase during the 1960s on Mount Mitchell. While environmental degradation and the increase in stocking rainbow trout lead to a decrease in

brook trout populations, nongame fish, such as chubs and dace, began to outnumber trout in certain waters of the Black Mountains (Silver 228). In order to remedy this problem, the National Forest Service and the Western North Carolina Wildlife Commission proposed a program that reflected the Great Smoky Mountains National Park's management of trout streams during the 1930s. The program would purge the headwaters of the South Toe and kill all the fish in the South Toe. A sanctioned fish kill by the Wildlife Commission had the ability to restock the waterways with rainbow and brook trout and create boundaries for the nongame fish, such as chubs and darters. After purging the fish in the South Toe, the process of restocking the tributaries with rainbow and brook from hatcheries helps to restore trout to the river, while the construction of a barrier keeps nongame fish from reentering trout waters (Silver 228).

Western North Carolina management of trout waters increased the ability for anglers to harvest trout under specific regulations. The new management helped to avoid the issues that the Smokies had with overharvesting brook trout during the 1930s by enforcing fishing licenses and size limits. Brown mentions that the Great Smoky Mountains also increased their regulations during the 1950s for anglers and says "tourists could bring the brook trout out of the water, but were obligated to set them back in the water" (Brown 186-187). Through the process of catch-and-release, trout fishing became more structured to maintain a balanced population and limited overharvesting fish. While the increase of regulations began to help the increase trout fishing in the Smokies and the Blue Ridge, the population of the brook trout continued to decrease.

Brown mentions that one way to increase support for brook trout repopulation during the 1970s was to increase public education of the brook trout in southern Appalachia to raise awareness for anglers (292). Conservationist also began to fund-raise for stream restoration projects that helped the aquatic ecosystem thrive. The Great Smoky Mountain National park

even closed certain streams beginning in the 1970s to the public in order to restore the brook trout population (Brown 292). Altman also points out that “only in 2002 has the National Park Service opened certain streams to catching mountain brook trout” (Altman 97). The goal of restoring the brook trout population to a self-sustaining level, and manage brook trout harvests, required limited fishing on heavily used streams within the Great Smoky National Park. The evidence that the efforts of brook trout restoration did not help increase population continued to confuse both scientists and park biologists, and while certain sections of rivers and streams were closed to public fishing, brook trout numbers still decreased.

The Relationship Between Rainbow and Brook Trout

Field research from Jerry W. Nagel and James E. Deaton titled “Growth and Longevity of Rainbow Trout in Two Headwater Streams in Northeastern Tennessee (1989)” helped provide an analysis of stream stressors such as habitat competition, environmental degradation, and over-harvesting of the rainbow trout in Briar Creek and Ramsey Creek on Buffalo Mountain in Johnson City, Tennessee. During an independent study with the Biology Department at East Tennessee State University during the Fall of 2016, I participated in field research that collected data on the sympatry, or interspecies-relationship, between the rainbow and brook trout populations and used Nagel and Deaton’s research as a baseline of study. Research and electro-shocking in Buffalo Mountain’s Briar Creek during a five-month period collected data from 28 zones helped to explain the competition between the rainbow and the brook trout. During the research, brown trout were not present in the streams and the focal species was the brook and rainbow while all other species were not included in the data analysis.

Electro-shocking is used by most Fish and Game Management agencies and field biologists. Electro-shocking causes an electric current to stun the fish within a small radius of a

submerged cathode and anode without permanent damage, although smaller fish have more risk of fatality. The stunned fish are collected and then weighed, measured, and counted as well as separated by species for accurate data assessment. The only fish collected during the shocking of Briar Creek from July to November of 2016 were rainbow and brook trout. The brook trout in Briar Creek are classified as wild, mountain brook trout by the Tennessee Wildlife Resources Agency (TWRA) as of 2016.

Beginning in July 2016, a habitat assessment in each of the 28 zones aided in the evaluation of each zones' capability to maintain healthy trout as well as provide analysis of life in a 1.74 mile stretch of Briar Creek between elevations of 2,000 feet and 3,200 feet. The zones refer to a one-hundred-meter section of stream that limited areas of shocking the trout to specific areas between the zone markers. The habitat assessment also provided an understanding of travel patterns for both species of trout during times of higher water levels, and although trout will not drastically move locations within a stream, degradation of the stream bank and natural damming have the possibility of affecting the results during shocking due to increased sediment and obstructions disrupting the electric current. The habitat included notes on if vegetation hung over the creek or if loose branches, leaves, or trash blocked the flow of water. Trout end their period of spring growth and begin preparing for fall spawning season during July. The end in spring growth helps when measuring the fish during the initial shocking and then recording changes during the following months.

Jerry Nagel and James Deaton began evaluating Briar Creek in 1979 and continued the research until 1987. Within the research of Nagel and Deaton, the age and length of rainbow trout provided the comparison data for the current research on Briar Creek in 2016. Although Nagel's results included only rainbow trout younger than three years of age, the analysis on the

length of the fish and the age of the trout help us to understand how the habitat affects the longevity of the rainbow trout. The independent research on Briar Creek during 2016 helps to evaluate the overall habitat of the two species of trout with the rainbow trout in the lower elevation zones and the brook trout population in the higher elevations above 3,000 feet. The importance of the combined study signifies the lifespan and growth of present rainbow trout, while the locations of the brook trout help evaluate their relationship with the rainbows. The results of the study indicate that the lifespan of the brook trout is decreased when rainbow trout dominate the same zone.

While not primarily focusing on the growth and longevity of just the rainbow trout, the current research takes Nagel's study one step further by examining the competition and relationship between the rainbow trout and the brook trout to focus on the interspecies relationship. Although the growth and longevity of both species of trout are an important, the current research's semester-long time constraint does not allow for an extended study over a period of years but rather a few months. Instead of focusing on the long-term growth and lifespan of the trout, the competition and movement of the trout helps to analyze behavioral patterns of the species in small streams. Each zone is shocked to locate and collect trout for examination. The collected trout are sedated, measured, weighed, and then injected with a visible elastomer that is visible under an ultraviolet light to accurately tag the trout's movement within the 28 zones.

Briar Creek also contains a monitoring station, or specific site for the TWRA for sympatric brook/rainbow trout monitoring. A sympatric trout monitoring station is a location where two species are located in the same geographic area and coexist, while the TWRA monitoring station is a geographic location of study. In the May 2004 "Fisheries Report 05-02,"

the TWRA mentions Nagel's introduction of brook trout into Briar Creek in 1983 due to the decrease in rainbow trout populations and the extent of brook trout habitat (Habera et al. 77). Through Nagel's introduction of brook trout, the species began to reproduce naturally and move upstream to higher elevations; however, the introduction zone sits around 2,200 feet in elevation and is a little low to support longevity and growth with brook trout. The increase in competition between the brook and rainbow trout also caused the populations of both species to change throughout the year. According to the "Fisheries Report 05-02," brook trout "relative abundance at the monitoring station generally increased during 1995-2002," but the population of brook trout in 2004 was "at its lowest level to date" (Habera et al. 78). This conclusion from the TWRA report indicates a dominance in rainbow trout over the brook trout.

In contrast with Nagel's and the TWRA's assessments of the water levels, the current research fell on a year that received very little rainfall throughout August and September with only minor showers in October. Because of this lack of rainfall, the initial habitat assessment became worse as the months progressed, and certain zones contained zero trout. On the other hand, higher elevation zones maintained decent water levels resulting in a larger quantity of collected trout, but blockages downstream caused some areas to lose much of the needed water and oxygenation for healthy trout. Nagel's assessments provided evidence during the time of his research that Briar Creek did support more water and better stream flow, but the 2010 "Fisheries Report 11-01" showed a decrease in the water levels due to drought and "only six trout were collected," a substantial decrease from 2008 (Habera et al. 69). Through the study of Nagel and Deaton, researchers are able to document the average growth and lifespan of stocked rainbow trout and whether or not the stocked population will reproduce to repopulate Briar Creek as a wild trout stream. The comparison between Nagel and Deaton's research to TWRA's fisheries

reports indicate that both rainbow and brook trout have the ability to produce young-of-the-year trout needed for maintaining a sustainable population of trout.

By understanding Nagel's work as well as fisheries reports from the TWRA, one could predict how the trout grow and how long they live within certain zones. Growth and longevity of the species provides evidence of maturity within the creek and how the brook and rainbow trout coexist. Understandably, lower elevation zones will hold more rainbows than the higher elevation areas due to the changes in habitat, and while rainbow trout will dominate the lower elevation areas due to a higher resilience to warmer water, the brook trout will populate the higher elevation locations more so than the warmer areas lower than 3,000 feet elevation as a result of colder, more oxygenated waters. However, one major focus is the zones that border these lower and higher elevations that both brook and rainbow trout populate and how they interact.

In these bordering zones, the brook and rainbow trout collected averaged around a ratio of 2:1 with rainbow trout being the dominant species. The higher zones did have an increase in brook trout with the ratio shifting more towards brook than rainbow trout. The ratio of trout in the bordering zones provide evidence for rainbow trout being the dominant species within the habitat overall, and the size of brook trout reflects Nagel's observations of the age and length of trout within Briar Creek. Throughout every zone, the maximum length of rainbow and brook trout are less than 200mm in length with the weight correlating with the length of the species. In the zones that had a deeper water level, good oxygenation, and areas of cover, the trout were larger in size and more mature than in the areas with poorer habitat conditions. This observation could reflect Nagel's assumption of the rarity of older, more mature fish that live longer than

three years. The larger pools held both brook and rainbow trout, but the rainbow trout were the dominant species and were almost double the size of the brook trout.

For the size of Briar Creek, the habitat would not be able to support larger trout without harming the reproduction cycles due to increased feeding and competition. Large increases of rainbow trout reproduction also damage the reproduction and longevity of the brook trout, while decreasing the available habitat and resources. Within some zones where the habitat promoted reproduction, young-of-the-year rainbow trout dominated the presence of brook trout showing that the rainbow trout reproduced more in quantity and more frequently than the brook trout. Throughout the zones, young-of-the-year brookies were present but less frequently and in fewer numbers than the rainbows. This decrease in brook trout reproduction could be associated with the increased pressure of rainbow trout as well as the lack of rainfall for Briar Creek.

Nagel mentions that rainbow trout do have a distinct competitive advantage of the brook trout as a result of various factors, and annual stream reports from the TWRA also provide evidence that rainbow trout will become self-sufficient after an established reproduction cycle (Nagel and Deaton 9). Brook trout on the other hand must compete for both habitat and food with the increase in the rainbow trout population, and while the rainbows compete with the brook trout, other predators, such as crayfish, hawks, and raccoons, risk the increase of mortality for young-of-the-year brook trout. Throughout the current research and shocking within each zone, large numbers of crayfish outnumber the trout. Although crayfish in larger streams and rivers provide many fish species with food resources, the large presence of them within a smaller creek can be a danger to young-of-the-year trout, and because the size and age of the trout do not typically exceed three or four years due to the poor habitat, most of the trout are not large enough to consume large crayfish (Nagel and Deaton 11).

By using both Nagel's research as well as previous TWRA annual stream reports, I could analyze the growth and longevity of the rainbow trout and evaluate the continued reproduction of the trout species. By shocking and then measuring, weighing, and implanting the trout with a visible UV elastomer that helps tracked marked trout, the movement of both brook and rainbow trout aids in the understanding of the relationship between the two species in minimal habitat. The results of the research could provide future biologists information on designated brook trout waters and their interactions with competitive species. However, one question that is important to consider for future research is if rainbow trout, or brown trout, should be stocked within wild brook trout streams if the hatchery raised species obviously competes with the native trout.

In the conclusion of Jim Habera's 2014 "Fisheries Report 15-01," the report states that "Upper Briar Creek typically supports a good wild trout fishery featuring brook trout except when reduced by droughts," (Habera et al. 49). Through this conclusion, the continued stocking of hatchery raised fish does affect the longevity of the brook trout, but drought-related impacts cause most of the problems according to the TWRA. The research by Nagel and Deaton also show that before the TWRA removed special regulations on size limits "rainbow trout are essentially protected from harvest while brook trout are not," which correlates with observations made by both Brown and Silver in the Smokies and the Blue Ridge (Nagel and Deaton 11). The removal of the brook trout results from the desire to catch a native, wild trout over the desire to catch a stocked rainbow trout. During the five-month study on Briar Creek, the importance of scientific research on brook trout populations became more obvious as the rainbow trout population dominated the habitat.

When looking at the data collected during the research on Briar Creek, one is able to see that the decrease in brook trout populations in southern Appalachia is the result of various

factors. While stocking hatchery raised fish increase habitat competition, over-harvest also contributes to the decrease, and although environmental degradation caused the loss of hundreds of trout streams in the Smokies and the Blue Ridge, Nick Karas points out a new factor in the continued decrease in the population of brook trout. Acid rain from industrial emissions causes an imbalance in the pH levels of trout streams, and while the pH levels in Briar Creek did not affect the research with brook and rainbow trout, brook trout do tolerate more acidic waters than the rainbow and brown trout. Karas states that “individual brook trout can tolerate a pH as low as 4.25 for a while, but the long-term effects of such an environment will eventually eradicate the population” (Karas 291).

The research helps provide evidence of the need for continued education on brook trout restoration and stocking programs throughout the Smokies and the Blue Ridge to increase the population of brook trout to a point of sustainability in higher elevation streams. Although environmental history and activism ultimately helped protect the natural resource commons of southern Appalachia, the importance of trout fishing in eastern Tennessee and western North Carolina correlate with the continued need for fish hatcheries and annual stocking programs. An increase in recreational tourism focused on trout fishing also helps manage the regulation of trout through specific rules for harvesting.

CHAPTER 6

OLD MEN AND MOUNTAIN STREAMS: THE WORLD OF TROUT FISHERMEN IN THE SMOKIES AND BLUE RIDGE

Important Nonfiction Trout Literature in Southern Appalachia

The portrayal of trout fishing in the Smokies and the Blue Ridge through memoirs helps readers connect to the life of a trout angler. Harry Middleton in his memoir *On the Spine of Time* (1991) writes about the connection between the Smokies and a trout angler. Middleton provides a story with the primary audience as anglers and the primary subject is trout. In his journey through the Great Smoky Mountains, Middleton helps point out the relationship between the angler and the trout by writing that “trout are excellent company, creatures of noble and admirable and perplexing qualities, much like human beings only more honest and sincere” (Middleton 75). Understanding the relationship between the angler and the trout, one can begin to sense why trout fishing in southern Appalachia has an allure.

Middleton gives the reader a sense of mystery within the waterways of the Smokies as well as personal reasons for entering the higher elevations in search of mountain trout: “I come for the beauty and the good fishing rather than grand truths” (Middleton 95). Through the romantic presentation of mountain solitude, readers begin to understand the importance of protecting these wild and mysterious trout waters. Instead of providing a descriptive analysis of trout fishing in the Smokies, Middleton provides examples of how an angler can connect to the natural world. However, the memoir still feels more like a novel than a collection of trout fishing adventures in the Great Smoky Mountains, and while trout are present, *On the Spine of Time*

focuses more on the passion of fly-fishing in the Smokies rather than on the practice of trout fishing in southern Appalachia.

A good trout fishing memoir provides both a story for anglers as well as practical knowledge that the audience can apply on their own fishing adventures. A northeastern Tennessee native, Bob Shanks helps bridge the gap between novel and memoir in *Around the Next Bend* (2012) by including a collection of fly-fishing adventures. Through these adventures, Shanks provides the readers with a more in-depth examination of trout fishing from the waters of the Smokies to Montana while providing personal secrets of the sport. The difference between Shanks and Middleton is that Shanks provides not only the locations fished but also examples of materials and flies used to catch trout, as well as local histories of the waterways. One of these histories helps to reiterate the importance of trout fishing in the Smokies and the Blue to the anglers of southern Appalachia.

As I discussed in Chapter 3, Margaret Brown and Donald Davis analyze the Tennessee Valley Authority's destruction of rivers and streams by building hydroelectric dams. Shanks writes as a conservationist that stood against the construction of the Tellico Dam and damming of the Little Tennessee River. Leading up to the construction of the dam, Shanks mentions that the Little Tennessee River was known in the southeast for producing large trout as well as being one of the most productive trout habitats in the country (Shanks 12). While Brown and Davis help understand the impact of the TVA dams on the environment, Shanks helps understand the personal impact of the Tellico Dam on outdoor enthusiasts. Not only did the construction of the dam destroy the habitat for trout and other aquatic insects, the destruction of the Little Tennessee River also flooded relics of the Native Americans. The presence of Cherokee artifacts and weir

structures during trout fishing with Shanks provides the evidence of native practices on the Little Tennessee River.

When trout fishermen hear about waters that possibly hold large trout, brook, rainbow, or brown trout, an increase of interest and activism can help protect the habitat for future anglers. However, rivers such as the Little Tennessee River are not as lucky and cause conservationists to try and protect other waterways from future harm. Although Shanks mentions that his fight against the Tellico Dam was unsuccessful, he continues to include stories that inspire anglers to keep fishing and protecting the rivers and streams. One story that Shanks includes is from a trout fishing trip in middle Tennessee on the tailwaters of the Duck and Elk rivers, and although the story does not revolve around direct conservation efforts, the description of the aquatic ecosystem helps us to understand the vital role of macro-invertebrates.

Shanks explains the role of entomology in his methods of fishing rivers and streams that do not have the specific characteristics to grow an abundant aquatic insect population. A trout angler must understand the life cycles of these insects to determine what the fish feed on as well as what size fly they should choose. In some areas, human interference causes the aquatic life to suffer and life cycles to change. As Nick Karas pointed out that acid stressors from industry can affect the trout in these waterways, disturbances to the natural environment can also affect the insects which directly affect the trout's diet. Many conservationists try to protect the trout's habitat just as much, if not more than restoring trout populations due to their understanding of the importance aquatic and terrestrial insects are to trout fishing overall.

However, trout fishing conservation does not only take the form of protesting against damming, rehabilitation of the population, or analyzing the aquatic insect environment, and in the case of Christopher Camuto, conservation also means manual labor on a trout stream. In

Camuto's memoir *A Fly Fisherman's Blue Ridge* (1990), Camuto states that "sooner or later, most trout fishermen find themselves on a trout stream with a cant hook, wrecking bar, or hammer in hand instead of a fly rod," and the reason behind these tools is to rebuild the trout habitat (132). Unlike with Shanks and his stand against the Tellico Dam, Camuto describes the back-breaking process of rebuilding an almost dry trout stream and turning it back into a thriving habitat. Through the help of the Forest Service and local chapters of Trout Unlimited, an organization known for its wildlife conservation projects, a rehabilitated trout stream has a better chance of recovery than if left to its natural course of time. Camuto explains how cooperation with agencies such as the Forest Service help sponsor conservation efforts, but mentions that the Forest Service focuses more on clear-cutting the forests and building roads rather than on investing in management of trout habitats (Camuto 133). The task of on rehabilitating trout habitat for future generations thus falls on current trout anglers.

In comparison to Shanks, Camuto also includes his story of trout fishing in the Blue Ridge Mountains of western North Carolina. The stories of fly-fishing in the Blue Ridge help understand the reason that anglers travel into the southern Appalachian Mountains in search of trout. Although *A Fly Fisherman's Blue Ridge* is a memoir, the story flows like a novel that ensnares readers to the mystery of trout fishing by pointing out that "there are enough miles of bright water in the Blue Ridge to support the fly fisherman's deep-seated need to believe in infinite possibilities" (Camuto 66). The possibility of large, wild trout in hidden mountain streams inspire anglers to test their luck as well as their patience. Trout fishing memoirs are an important element to the positive portrayal of trout fishing in the Smokies and the Blue Ridge as well as inspire anglers to travel into southern Appalachian to fly fish.

A Guide to the Guides

In order to buy fly-fishing equipment or flies to match the insects in a local river, one would have to hope that the local outdoors store carried the materials in stock. However, the twenty-first century helped bring more attention to trout fishing and began advertising more trout fishing locations. Trout fishing became commodified for an area that had rivers and streams full of trout during a rebirth in outdoor recreation in the late 1970s. Fly shops and guide companies began to expand in the Smokies and the Blue Ridge and carried trout fishing equipment and materials for fly tying.

Through promotion of the Great Smoky Mountains National Park and Cherokee Reservation, guide books began to focus on trout fishing on specific waters and help provide anglers with accessible locations. Guide books also focused on the local aquatic insects of the region as well as provide trout fishermen with fly patterns in case they wanted to tie their own for the local waterways. The increase in recreational activities and trout fishing helped to increase the local economies close to the rivers of the Smokies and the Blue Ridge. Heidi Altman observes that in Cherokee, North Carolina, “the waters, in particular, draw anglers from all over the eastern United States and contribute a considerable sum to the local economy” (Altman 86). Trout fishing tourism that contributes to the local economy is surprising when considering statements from authors like Shanks that mention a time when fly fishermen as well as female anglers were rare on the local waters of eastern Tennessee (Shanks 2). On the other hand, Shanks was not expecting the increase of trout fishing interests during his youthful angling adventures.

By the early 2000s, trout fishing in southern Appalachia was expanding throughout the Smokies and the Blue Ridge Mountains, and in the revised edition of *Trout Streams of Southern Appalachia* (1994), Jimmy Jacobs mentions that the practice of fly-fishing dominates trout

fishing on most rivers and streams (12). As a result of the increase in anglers, Jacobs helps entering trout tourists in finding rivers and streams to publicly access throughout southern Appalachia. In the sections of the Great Smoky Mountain National Park as well as the western portion of North Carolina's Blue Ridge Mountains, Jacobs provides information that details the conditions for fly-fishing, the type of fish one might catch, and the best type of flies to use. The details included in the guide, however, do not provide the necessary information for trout anglers to completely understand how the trout streams of southern Appalachia differ from larger rivers in the western United States.

Jacobs observes that anglers that travel into the trout streams of southern Appalachia “swear that these creeks are unfishable for the fly-caster,” but western trout anglers are not accustomed to fishing on tight mountain streams or fishing for trout that spook more easily than on larger, open-spaced rivers (12). With the increase in trout fishing in the Smokies and the Blue Ridge, trout fishing authors understand that tourists that want to fly-fish for wild, mountain trout need to understand the area they are fishing in order to catch a trout on a fly. To accomplish this, Don Kirk and Greg Ward published a guide for fly-fishing in the Great Smoky Mountains aptly titled *The Ultimate Fly-Fishing Guide to the Great Smoky Mountains* (2011). The guide not only provides anglers with how to fish the small streams but gives crucial information for trout fishing in the area.

Unlike Jacobs, Kirk and Ward outline the waterways of the Smokies by giving the river system, the aquatic insects, local fly shops and guide services, and even the fishing pressure. In addition to mentioning the increase in both trout fishing and guide services for tourists, the authors mention that “the city of Gatlinburg even promotes fishing for trout, something that was unheard of only a few decades ago” (Kirk and Ward 1). The increase in both trout fishing as well

as the practice in fly-fishing help boost the local economies in the southern Appalachia trout towns and promote the Smokies and the Blue Ridge as popular trout fishing destinations in the United States. However, the guide points out that trout fishing in the mountains is very difficult and is one of the biggest obstacles for fly-fishermen which reflects the observation by Jacobs concerning western tourists (Kirk and Ward 44). One factor to the overall difficulty for fly-fishing in the Smokies and the Blue Ridge is the overgrowth of vegetation that crowds the stream banks. On the other hand, the low-hanging vegetation helps provide trout with a diet of terrestrial insects, such as grasshoppers, ants, and beetles, and although anglers must adjust their techniques for casting, the overgrowth helps provide good cover to avoid spooking wild trout.

While Kirk and Ward's guide is a vital resource to fly-fishing in the Smokies, the guide indicates the aquatic insects most commonly identified as well as the common patterns to match the hatch but does not provide detail about the patterns for trout anglers. A few years after the publishing of Kirk and Ward's guide, Don Kirk decided to take the task of collecting more data to provide anglers with specific information of fly patterns used in the Great Smoky Mountains. In *Hatches and Fly Patterns of the Great Smoky Mountains* (2014), Kirk indicates not only the species of insects but provides the imitating patterns best suited for certain streams. Kirk's guide also allows anglers into insight to the history of fly tying and well know local fly tiers. For contemporary fly-fishermen, the guide is the trout fishing Bible for the Smokies and the Blue Ridge, and although Kirk focuses on the Great Smoky Mountains, many of the aquatic insects and fly patterns are similar to the rivers and streams within the Blue Ridge Mountains of western North Carolina. For a trout fisherman, knowledge of the habitat is crucial to catch fish, and Kirk mentions that "the streams of the Great Smoky Mountains are incredibly diverse in terms of the number of critters that reside there with the trout and bass" (Kirk 102). Through the help of

guides, travelling and local trout anglers have a better understanding of the habitat as well as the importance of protecting the environment.

The increase in recreational tourism and trout fishing during the past few decades created the need for more fly shops, guide services, and guide books to promote trout fishing in southern Appalachia. By understanding both the history of trout fishing and the science behind repopulation projects, one can begin to see how the practice of fly-fishing helped to increase tourism. For both novice and veteran anglers, guide books help anglers learn about the local habitat and areas of access, and while these guides continue to expand and include more areas to fish, the local promotion of trout fishing and conservation also increases the number of trout anglers throughout the Smokies and the Blue Ridge.

The growth in early ecotourism and sport fishing in the Smokies and the Blue Ridge is seen during the 1930s to the 1950s through Smokies historian, Margaret Brown, but the statistical analysis of how much the trout fishing added to the economy is unknown. The increase in trout fishing literature during the 1980s through 2017 provides evidence for the need of increased materials for anglers, as well as a possible growth in local economies through sport fishing. According to Don Kirk and Greg Ward, the Great Smoky Mountains National Park “has been one of the country’s most popular fly-fishing destinations,” and the popularity in sport fishing creates an allure for future trout anglers (Kirk and Ward 2). The twenty-first century helped to increase trout fishing tourism and fly-fishing influence on younger audiences through instructional clinics and educational programs.

CHAPTER 7

CONCLUSION

The Future of Fly-Fishing

In late March of 2017, nearing the final months of my graduate program in Appalachian Studies at East Tennessee State University, I participated in the First Annual Tailwater Roundup, a two-man fly-fishing tournament, sponsored by the South Holston River Lodge. The tournament, for me, was a culmination of the two years of fly-fishing in northeastern Tennessee and a test of everything I learned through my thesis research. I began the trip to the South Holston River at dawn and reflected on the history of trout fishing. The native Cherokee used fishing methods that caught large amounts of fish to feed their communities, and traditional fishing methods began to change as European fly-fishing influences transitioned native practices to early methods of sport fishing. Southern mountaineers, such as Horace Kephart, practiced both sport fishing and fishing for sustenance during the early twentieth century.

I arrived at the parking lot at the South Holston River, near Osceola Island, a few minutes early of the starting time. My partner and I checked in and met the judge that would accompany us during the seven-hour tournament and record our catches. “We should get our gear ready and pick out our location to fish.” Spring storms were beginning to move into the area, and we knew the trout were going to be difficult to catch with the rain. I looked through my selection of flies and remembered the early flies used in America that were adaptations of European flies. I could not use any of the early flies mentioned by Ian Whitlaw or Mary Orvis Marbury, because the trout in the South Holston River preferred micro-midges tied during the latter twentieth century

rather than the big wet flies of the early 1900s. Larger trout could be caught on the smallest fly, and the longest fish of the day would win the tournament so the fly selection had to be perfect.

The South Holston River is a tailwater below TVA's South Holston Dam, and I could hear the words from local trout memoirs that big brown trout reside beneath the surfaces of the areas I was fishing. My group began fishing a small stretch of shallow water that none of the twenty teams were fishing, and the rain began slow at first, then progressed to a light downpour. My partner and I quickly caught two small trout, too small to register into the tournament. I cast upstream and let the two small flies drift with the current slowly. I remembered what Smokies historian, Margaret Brown, said about trout fishing in the 1930s and the amount of trout anglers that had caught their limits on the first day that the Great Smoky Mountains National Park opened streams for fishing after stocking hatchery raised rainbow trout.

The history of trout fishing in southern Appalachia helped me appreciate that trout are still in the rivers and streams and can grow to large sizes as a result of increased regulations. American adaptations of European flies helped me prepare to catch the largest fish and win the tournament. However, I should have read the guides more clearly, because I did not know how to catch large trout in the rain. I was sure that the forty other anglers, some local fly-fishing guides, knew what they were doing. Four hours into the tournament and my partner and I had zero trout registered. The sun eased out of the clouds and ended the rain for us, while warming up the water temperature and causing some insects to hatch. The study of entomology allowed me to catch one, twelve-inch rainbow trout after I examined the insects that floated on the surface of the water and the smaller insects that clung to the rocks along the riverbed. Unfortunately, the trout was not long enough for my partner and I to win the tournament, but we did gain appreciation during a friendly competition between trout anglers.

The large group of anglers proved the large interest in trout fishing has grown in the twenty-first century in southern Appalachia. The fly-fishing tournament allowed me to utilize everything I learned during the writing of my thesis research. The history of native fishing practices, European fly-fishing influence, and the history of the timber industry's destruction in the Smokies and the Blue Ridge from 1880-1930 helped me to appreciate trout fishing in southern Appalachia in 2017. The understanding of entomology and the history of artificial flies provided the knowledge for me to catch a few trout on a rough day fishing in the rain. Trout fishing memoirs and how-to guides motivated me to continue fishing through the difficult weather conditions and not give up on my passion. I understood the importance of trout fishing in the Smokies and the Blue Ridge as the tournament ended and the contestants stayed to talk to each other and formed a sense of community while promoting local guide companies.

On the other hand, the future of trout fishing in southern Appalachia is uncertain. The results of this research only introduce a brief overview of the history and importance of trout fishing in the Smokies and the Blue Ridge. The absence of statistical data on the recreational tourist economy does not indicate a clear growth in trout fishing between 1930 and 2017, although an increase in the uses of fly-fishing publications suggests otherwise. Personal interviews with trout anglers in eastern Tennessee and western North Carolina would provide insight to the lifestyle of fly-fishing, as well as an understanding of why individuals began trout fishing.

Future research possibilities include continued study of inter-species relationships between brook trout and rainbow trout and if stocking programs are harming the brook trout's population. A study on ecomusicology in National Parks, such as the Great Smoky Mountains National Park, would help examine the effects on hiking trails and camping areas on recovering

brook trout streams. The promotion and education of conservation projects from trout anglers acting as stewards of the rivers can lead to an increase in trout interest and can support positive environmental awareness. The future of trout fishing in the Great Smoky Mountains and the Blue Ridge Mountains during the twenty-first century is in the hands of the current anglers.

The importance of this study is to provide readers with an understanding of trout fishing in the Smokies and the Blue Ridge. The historical overview of native Cherokee fishing practices and the transition to sport fishing from European influences indicates newer methods of trout fishing. The brief summary of the timber industry's role in the destruction of southern Appalachian forest is important to the discussion of the creation of the United States Forestry Service and the Great Smoky Mountains National Park. The ecological study on the relationship between the native brook trout and stocked rainbow trout help understand the on-going struggle of rehabilitating brook trout into native mountain streams. Trout fishing memoirs and how-to guides attract new generations of trout anglers, while promoting conservation efforts and educating anglers on local fly hatches and fly patterns.

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APPENDIX

Appendix A

Trout Pictures from Tennessee



Rainbow Trout from Burns Park in Kinston Springs, Tennessee

I caught my first stocked rainbow trout in a small pond in middle Tennessee. The cheap reel and rod made for difficult casting and presentation for the weighted fly, but the rainbow trout would not respond to any other fly. After fishing the small pond for trout, I used small dry flies to practice the basics of casting and presentation. The three rainbow trout I caught were the only trout I have ever caught in middle Tennessee. Photograph by Nathaniel Skaggs.



Rainbow Trout from the Watauga River in Elizabethton, Tennessee

This trout responded to a large caddis hatch during the late afternoon and was the largest of 30 fish caught during the hatch. Prior to the hatch, I used a combination of small zebra midges and nymph patterns, but my variation of the elk hair caddis proved to be the correct fly for the hatch. I saw four other fly-fishermen during the hatch, but saw no one catch any trout. Photograph by Nathaniel Skaggs.



Brown Trout from the South Holston River near Bristol, Tennessee

This is still the largest trout I have caught since beginning fly-fishing. The trout measured right at twenty-two inches. The section of river that contained this brown trout also has large rainbow trout that I can see from the bank, but these fish still elude me regardless of presentation and fly selection. The local fly guides in Bristol, Tennessee continue to tell me to use tiny midges close to the bottom, but I continue to struggle catching monster trout. Photograph by Nathaniel Skaggs.



Brook Trout from the Great Smoky Mountains National Park

This was my first brook trout as an angler. The stream was only two-feet wide and less than a foot deep, but the brook trout thrive in this type of habitat. I fished sections of Rainbow Falls leading up to the waterfall at the pinnacle of the trail, but this brookie was caught 100 yards from where I parked and slightly off the hiking trail. This is the only brook trout I have caught from the Great Smoky Mountains National Park. Photograph by Nathaniel Skaggs.



Rainbow Trout from the Doe River in Roan Mountain, Tennessee

This little rainbow trout was the first trout I caught on a tenkara rod. The rod does not have a reel and causes the angler to work the angle of the rod to bring the fish closer to the net. I struggled for ten minutes to net this rainbow trout after I hooked it in a small riffle. One good factor about the tenkara rod is that there is only a limited amount of line and the trout cannot travel far.

Photograph by Nathaniel Skaggs.



A male sulphur dun (*ephemerella invaria*).

This sulphur dun landed on my rod handle during a hatch on the Doe River in Roan Mountain State Park. By noticing the hatching insects, I switched to a pattern that imitated the sulphur.

This picture is a prime example of educating yourself on the local entomology and matching fly patterns. Before I noticed the small, yellow insect, I could not catch a trout, but after I made the switch, I caught three in a few minutes of each other. Photograph by Nathaniel Skaggs.



Brook Trout from Rocky Fork State Park in Flag Pond, Tennessee

This little brook trout took a small dry fly during a fly-fishing program that I taught as a Seasonal Interpretive Ranger at Rocky Fork State Park. While brook trout are generally found above 3,000 feet in elevation, I caught this brookie around 2,500 feet in elevation. The fly-fishing program focused on catching rainbow trout because of the lower elevations, but this brookie was a nice surprise to the participants that had never seen a native brook trout in the wild. Photograph by Nathaniel Skaggs.

Appendix B

Flies of the Smokies and the Blue Ridge



Beadhead Pheasant Tail Nymph (Top) and Zebra Midge (Bottom)

The Beadhead Pheasant Tail Nymph (top) is a traditional emerging pattern, and the tungsten bead allows the fly to sink faster. The Zebra Midge (bottom) imitates most small midges and is an important pattern for trout fishing. The combination I used to catch the large brown trout was the Pheasant Tail as the top nymph and the Zebra Midge extended by eight inches of tippet material as the bottom nymph. Photograph and flies by Nathaniel Skaggs.



Rocky Fork State Park Flies

I tied these five flies for a mountain stream fly-fishing program at Rocky Fork State Park. 1. Griffith's Gnat. 2. Sulphur. 3. Zebra Midge. 4. Brown Midge. 5. Blue Dun Midge. The Griffith's Gnat is a blend of grizzly hackle and brown hackle trimmed short and catches the most trout along Rocky Fork Creek. Hackle feathers are from the neck of a bird, most commonly a rooster. My version of the Sulphur is a size #24 and uses a grizzly hackle for buoyancy and is best used in the higher elevations of the park. The Black Zebra Midge is a standard pattern with a tungsten bead head. The Brown Midge is a brown goose biot wrapped for the body with a small copper bead and is perfect for deeper pools. The Blue Dun Midge is a dun goose biot wrapped for the body and a small tungsten bead on a size #24 for the deeper pools. Photograph and flies by Nathaniel Skaggs.



Coachman

The Coachman was one of the first wet flies used in North America. The pattern (above) indicates the European influence of fly-fishing and trout angling, but by 1978, the coachman would receive some American variations. The original Coachman (above) is still used in 2017 as an emerging pattern and as a streamer depending on the person tying the fly. I use this pattern with some variation on the color of the wing and the hackle feathers depending on the season and the river I am fishing on, but the original Coachman pattern is a wonderful top fly for nymphing, or using two wet flies to catch trout. Photograph and fly by Nathaniel Skaggs.



Royal Coachman

The Royal Coachman is the American adaptation of the Coachman. The use of the brown hackle feathers near the eye of the hook allows the fly to float on the surface film of the water. The added tail extending past the bend of the hook present the appearance of a mature insect, and the added white, goose biots, barbs of a goose quill, give the fly a pair of wings. The red band around the middle of the fly provide a distinct attractor for trout. The Royal Coachman resembles the Royal Wulff, the Carolina Wulff, and the Tennessee Wulff, but the Royal Coachman uses pheasant tail tippets for the tail rather than buck tail. I use more hackle feathers to keep the fly floating longer after extended use. Photograph and fly by Nathaniel Skaggs.



Quill Gordon

The Quill Gordon was a product of Theodore Gordon and began the dry fly movement in America. Although not restricted to southern Appalachia, the Quill Gordon imitates various insects in the Smokies and the Blue Ridge, and Gordon created the fly for use in the Catskill Mountains to catch brook trout during the 1890s. The version above is a slight variation that I use for mountain streams in northeast Tennessee and uses a synthetic quill wrap for the body of the fly and a blue dun hackle feather. The original pattern is slightly darker and uses an olive hackle feather, but during blue-winged olive hatches in northeastern Tennessee, my variation can be deadly. Photograph and fly by Nathaniel Skaggs.



Royal Wulff

The Royal Wulff is a variation of the Royal Coachman created by Q.L. Quackenbush in 1930 that used Lee Wulff's hair-wing style. One major difference between the Royal Wulff and the Royal Coachman is the use of white calf hair for the wings instead of white goose biots. In the pattern above, I used white poly yarn instead of white calf hair because the yarn increases buoyancy in the water. The other difference between the Royal Wulff and the Royal Coachman is the use of buck tail for the fly's tail instead of pheasant tail tippetts used for the Royal Coachman. Photograph and fly by Nathaniel Skaggs.



Tennessee Wulff (Top) and Carolina Wulff (Bottom)

Although the Royal Wulff is used throughout the United States, the Tennessee and Carolina Wulff are unique to the Smokies and the Blue Ridge. The Tennessee Wulff (top image) uses a green band instead of the traditional red and is used in the Great Smoky Mountains. The Carolina Wulff (bottom image) uses a yellow band instead of the traditional red band for streams in western North Carolina. The distinction between the Tennessee Wulff and Carolina Wulff is dependent on the insects present in the Smokies and the Blue Ridge during a hatch and what the trout respond to more. Photograph and flies by Nathaniel Skaggs.



Elk Hair Caddis (Left) and Elk Hair Caddis Variation (Right)

The Elk Hair Caddis is an important pattern for all trout anglers in the United States and imitates most forms of the caddis fly depending on the size. The image on the left shows the traditional pattern with elk hair for the wings. The variation on the right is a unique version that I tie and use on streams in the Smokies and the Blue Ridge. My version uses Cul-De-Cunard (CDC) feathers, or feathers from the butt of a duck, instead of elk hair and is both a dry fly and a wet fly depending on what the trout respond to more. Photograph and flies by Nathaniel Skaggs.



Hazel Creek (Top) and Fore & After (Bottom)

These two flies are unique to southern Appalachia, and Don Kirk mentions that they are rarely used outside of the Smokies and the Blue Ridge. The Hazel Creek (top) uses a light-yellow body to attract fish while the robust hackle keeps the fly on top of the water. The Fore & After (bottom), on the other hand, is very similar to the Carolina Wulff (Figure 14) with the use of the yellow band, but instead of buck tail, the Fore & After uses pheasant tail tippets for the tail as well as grizzly hackle at the back of the fly. The mix of brown hackle and grizzly hackle feathers near the eye of the hook allows for the fly to float better on rougher portions of mountain streams. Photograph and flies by Nathaniel Skaggs.

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