

**HOW DO YOU FLY...FISH:
ENVIRONMENTAL BEHAVIOR, TRAVEL, AND SPORT INVOLVEMENT
OF FLY FISHERS IN NORTH CAROLINA**

by

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The connection between recreation and tourism is not a new concept; the two are frequently in concert in planning, marketing, research, and education. Within the realm of sustainable tourism, it is important to understand the implications that a tourism group has on their environment. Looking at fly anglers in North Carolina, this study proposes a relationship between fly fishing and pro-environmental behaviors, which is consistent with previous literature dating back to the mid-1970s, suggesting a positive relationship between outdoor recreation participation and pro-environmental behavior. This relationship is less when considering consumptive sports over appreciative sports. As a consumptive sport, it is not clear whether fly fishing enthusiasts engage in pro-environmental behaviors and, if so, which fly fishermen/women are most likely to engage in the behaviors. To further analyze this relationship and to determine the existence of a relationship between environmental behaviors and fly fishing travel, the trip profiles of fly anglers are gauged against their expressed environmental behaviors.

**HOW DO YOU FLY...FISH:
A LOOK AT THE CONNECTION OF ENVIRONMENTAL BEHAVIOR TO TRAVEL
AND SPORT INVOLVEMENT OF FLY FISHERS IN NORTH CAROLINA**

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by:

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CHAPTER 1: INTRODUCTION

Destinations increasingly recognize the need to attract and retain tourists who are willing to engage in pro-environmental behaviors. Kollmuss & Agyeman (2010, p. 240) define pro-environmental behavior as ‘behavior that consciously seeks to minimize the negative impact of one’s actions on the natural and built world (e.g. minimize resource and energy consumption, use of non-toxic substances, reduce waste production)’. As the adverse effects of human interaction are felt by the environment, tourism destination managers are increasingly realizing the need to plan for certain environmental issues as they grow. Part of this planning involves the attraction of tourists who engage in pro-environmental behaviors. Dolnicar & Leisch (2008) describe ‘selective marketing’ as a tool for reaching these consumers but also note that other tools could be developed.

New Zealand kayaking and canoeing company, Blazing Paddles, has embraced this realization with their wildlife viewing paddle trips. The company hosts a range of trips on various bodies of water throughout the country and caters to paddlers, who are generally characterized as having a high degree of pro-environmental behavior because paddling is an appreciative outdoor recreation activity. In accordance with previous research by Dawson and Lovelock (2008), as well as Thapa (2010) it was found that tourists engaging in ‘appreciative’ (non-consumptive or experience based) recreation activities generally have a stronger environmental commitment than their ‘consumptive’ counterpart does. Consumptive recreation is a recreation activity that involves taking or consuming some resource from the environment whereas appreciative recreation is a recreation activity performed in a non-consumptive manner (Thapa, 2010).

A lifestyle segment that has been overlooked in the pursuit of pro-environment tourists is anglers. While some research has been conducted related to environmental behaviors and

anglers (e.g., Bryan, 2010; Preston-Whyte, 2008; Snyder, 2007;Theodori, Luloff, & Willits, 1998), the tourism literature overlooks the traveling fly angler segment in favor of recreationists who pursue appreciative activities. A search of top-ranked tourism journals, including the *Annals of Tourism Research*, *Tourism Management*, the *Journal of Travel Research*, and the *Journal of Sustainable Tourism*, indicated few tourism researchers mention targeting anglers as a lifestyle segment and those that mention anglers do not characterize them as pro-environmental tourists.

One reason the lifestyle segment, fishermen/women, has been overlooked by marketers who are pursuing pro-environmental consumers is that fishing is often incorrectly categorized a consumptive outdoor recreation activity. In recreation, it is common to create a dichotomy based on this notion of non-consumptive versus consumptive recreation – typically, wildlife viewing is deemed non-consumptive while hunting and fishing are considered consumptive because of their direct involvement with the animals (Tremblay, 2001). For example, Dawson and Lovelock (2008) conducted research comparing marine tourists visiting New Zealand, specifically sea-kayaking tourists (appreciative) and sea-angling tourists (consumptive), to determine the environmental values and environmental behaviors of each segment.

However, a sub-group of fishermen, fly fishers, have organizations that are known for their commitment to the preservation of resources. For example, organizations such as Trout Unlimited and Coastal Conservation Association are groups of anglers dedicated to conserving the natural setting and preservation of species in the areas where they fish. These organizations have extensive memberships consisting of anglers of all types but are most closely associated to those who use fly tackle: Trout Unlimited (2010) reported over 140,000 members in 2009 and Coastal Conservation Association reports over 100,000 members (The CCA Story).

Further, Orvis is a well-known retailer of fly-fishing products as well a variety of other retail items. Orvis (a) promotes sustainability through conservation awareness. Since 1999, Orvis has taken a stance on 39 separate issues regarding sustainability ranging from habitat protection and reconstruction to the protection of specific wildlife species worldwide. Their blog site, Orvisnews.com (Orvis (b)), hosts articles relating to various topics that are important to their customers, including conservation. The topics discussed here are not of the projects that Orvis is currently conducting, they are highlights of efforts conducted by other people and organizations working to protect their environment. These companies are simply two of the many involved in environmental issues that directly affect the activity that their products/services support.

Trout Unlimited, in particular, protects cold-water habitats. Founding member Art Neumann made the claim, “Take care of the fish, and the fishing will take care of itself” (Trout Unlimited, 2010, p. 2). Many fly-fishers adhere to this idea. In the upper tiers of angling specialization, Technique Specialists and Technique-Setting Specialists anglers (which consists of fly fishers) were inclined to support habitat management as well as catch-and-release policies (Bryan, 1977). With regard to conservation, Theodori, Luloff, and Willits (1998) found that there was a higher degree of correlation between anglers and conservation than with participants of other non-consumptive recreation activities. The research also claimed that ‘Consumptive versus Non-Consumptive’ was too simple of a classification system to effectively grasp the extent of ‘Consumptiveness’ associated with a particular recreation activity (Theodori et al., 1998). These results suggest that anglers may vary in their perception of conservation and resource utilization.

If fly fishing has been misclassified as a consumptive activity, pursuing fly fishers as a lifestyle segment may help tourist destinations attract those tourists who engage in pro-environmental behaviors. The environmental behaviors of those who fly fish as a leisure pursuit would suggest that they would be drawn to destinations that share their beliefs about environmental protection. Fly-fishing guide service Sweetwater Travel Company offers angling trips to various locations spanning the globe and promotes the necessity of sustainable practices along the way. Sweetwater employs only local guides to support the local economies that they are reliant upon, hold some trips to a strict catch-and-release policy and even require single barbless hooks of all anglers that travel with them regardless of destination, this promotes a safer release of any fish not harvested (Sweetwater Travel Company).

This lifestyle segment is important because in 2006, 30 million American anglers spent a reported \$42 billion on travel expenditures for fishing trips alone (U.S. Department of the Interior, Fish and Wildlife Service, and U.S. Department of Commerce, U.S. Census Bureau). Companies, like Sweetwater, that are able to capture the environmentally conscious fly angler, will be exposed to a lucrative portion of that market that contributes greatly to domestic and global tourism. The 5.5 million fly fishermen in the United States took a reported 91 million trips in 2010. These trips varied in length as some fishermen chose to take trips to areas close to their homes while others took overnight trips to far off destinations (Recreational Boating and Fishing Foundation, and Outdoor Foundation, 2011).

Therefore, this thesis attempts to address the gaps in the existing literature by addressing four research questions:

RQ 1 - Does involvement level in fly-fishing positively correlate with pro-environmental behaviors?

RQ 2 - Are non-consumptive fly fishing enthusiasts more likely to participate in environmental sustainability efforts than consumptive fly fishing enthusiasts?

RQ 3 - Do those who travel to fly fish think and act more sustainably than those who do not?

RQ 4 - Do environmental values influence travel behaviors for fly fishers?

The paper is organized as follows: First, the literature on marketing tourist destinations to environmentally conscious consumers is reviewed. Next, previous literature that defines fishing as a consumptive activity is reviewed. Following this review, background is provided on fly fishing that describes why 1) fly fishing might be incorrectly categorized as a consumptive outdoor activity and 2) fly fishers are an important segment. The research questions are developed from this review. After the literature review, the methods used to answer the research questions are described; the results of the study are reported and discussed, followed by a conclusion that summarizes what the results might mean for tourist destinations and environmental action agencies.

CHAPTER 2: LITERATURE REVIEW

Sustainable Tourism and Protection of the Natural Environment

The protection of the natural environment is one facet of sustainable tourism research. Sustainable tourism is defined as “tourism development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (Weaver, 2006, p. 10). Sustainable tourism scholarship influences the research and implementation of strategies/policies related to cultural preservation, economic impacts, and the protection of the natural environment.

Even though it is only one component of sustainable tourism, the protection of the natural environment has received increased attention in tourism literature over the past two decades because of its importance to tourist destinations. Tourism as an industry has seen enormous growth in the global economy for nearly 40 years. Within that growth, different sectors of tourism have developed and one such sector is nature-based tourism or nature tourism. Nature tourism as a segment is growing so rapidly, its growth is outpacing that of the tourism industry as a whole (Mehmetoglu, 2005).

As environmental considerations constitute a significant portion of the decision-making criteria used by tourists in destination planning, climate change is poised as a major contributor to global tourism. While the degree to which tourism contributes to global climate change remains unknown, the fact that it does contribute is well documented and contributes to policy and business decision within the tourism industry (Yazdi & Shakouri, 2010). As a result, the United National Environment Program (UNEP) concluded that the impact of climate change “must be considered the greatest challenge to sustainability of tourism in the 21st century (World Tourism Organization and United Nations Environment Programme, 2008, p. 38).

Natural resources are a common driver of tourist motivation to visit a destination. Nature-based tourism is one of the fastest growing segments of tourism globally, partly because of the public's increase in awareness and concern for the natural environment (Rennicks, 1997). The nature-based recreation segment alone has seen dramatic growth since 2000 (Cordell, 2008). In the United States alone, nature-based recreation grew by 6% from 2001 to 2006 while trip related expenses increased by 38% in the same time (U.S. Department of the Interior, Fish and Wildlife Service, and U.S. Department of Commerce, U.S. Census Bureau, pp. 6, 53).

Tourism managers and researchers are interested in the impact of climate change because of its impact on the desirability of tourist destinations. Within the tourism industry, many destinations are receiving negative impacts from climate change. Winter sports destinations are having problems with snow loss and popular island locations are experiencing flooding, destinations of all types are suffering from water shortages and in some destinations the weather is simply too hot to be enjoyable for tourists (Bows, Anderson, & Peeters, 2009). Due to these ill-effects, there is an increasing trend for businesses and destinations to adopt "green" or sustainable practices. Throughout North Carolina, entities designed for the support of sustainable practices in tourism are being developed to assist businesses in adapting to changing climate conditions (Curtis, Arrigo, Long, & Covington, 2010).

The necessity of a more sustainable approach to tourism brought about a new way to address the issues associated with climate and tourism – while there is no unified definition for sustainable tourism, the World Tourism Organization established by the United Nations defines the subject as:

Tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities. (World Tourism Organization)

This is an important matter within tourism because as climates shift and sea levels rise, destinations established for a particular product/offering may lose their ability to provide that experience in the future. The erosion of beaches, balding of mountain tops, snow loss, species relocation or loss, and extreme weather/climatic events are just a few of the pressing issues caused by climate change that tourism managers and researchers are studying and planning for.

Tourism managers and researchers are interested in the impact of tourism on climate change because tourism is a known contributor of climate change and the tourism industry is already seeing the ill-effects of climate change at destinations of all types. Climate change is a serious problem and tourism is a major contributor, especially trips utilizing air travel. While only 2% of the global population utilizes air travel as a form of transport (Yazdi & Shakouri, 2010), it constitutes 17% of all trips for tourism purposes (Bows, Anderson, & Peeters, 2009). The actual effect of air travel as a contributor to global greenhouse gas emissions is a source of some discrepancy (Yazdi & Shakouri, 2010, p. 343) (Bows, Anderson, & Peeters, 2009, p. 7). According to Yazdi and Shakouri (2010) it is estimated that air travel for tourism contributes between 2% and 2.5% of all CO₂ globally. Research also showed that tourism, and all the devices therein, contributed an estimated 5% of global greenhouse gas emissions (Yazdi & Shakouri, 2010).

One strategy tourism managers are using to protect the natural environment at their destinations is marketing the destination to attract consumers with high environmental values/environmental ethics. Research has defined environmental ethics as “*The moral relations*

that hold between humans and the natural world. The ethical principals governing those relations determine our duties, obligations, and responsibilities with regard to the Earth's natural environment and all the animals and plants that inhabit it" (Taylor, 1986, p. 3).

Through research and market analysis, guidelines have been developed suggesting the best ways to target this environmentally sensitive market segment. First, a biocentric market segment must exist. Second, that segment must align with the tourism plan or product of the destination or business. Third, the segment must be economically viable (Dolnicar & Matus, 2008).

Since this segment first began as a topic of study, much research has been directed toward the segment, now known as 'green consumers' or 'green tourists'. This segment is focused on the health of others and the environment with great consideration for the consumption of resources and unnecessary waste, animal cruelty, endangered species preservation, and the adverse effects of their purchase decisions on the environment and others (Bergin-Seers & Mair, 2009). The bulk of the research is directed toward an understanding of the drivers/motivations of travel for this travel market segment as this understanding allows practitioners to reach the audience whose values will be closely aligned with their own in a more effective manner.

Tourism and the Pro-environmental Consumer

The 'green consumer', 'ethical tourist' or 'ecotourist' is a known market segment within the tourism industry to which tourism managers market their destinations and businesses. A green or pro-environmental consumer seeks to minimize his/her environmental impacts when consuming products, like tourist destinations (Bergin-Seers & Mair, 2009). Holding nearly 10% of the global tourism market in 1989 with a growth rate of approximately 30% annually, ecotourism is the fastest growing segment within the global tourism industry (Herbig & O'Hara, 1997).

The success of ecotourism's firm hold on the travel industry may be attributed in part to its successful implementation in developing countries. Nations spanning the globe are using tourism for the purpose of economic development. The diminished environmental woes associated with this style of tourism when compared to traditional mass tourism stands as a potential cause for the attractiveness of ecotourism within these developing destinations (Herbig & O'Hara, 1997). In addition to the limited environmental impacts of ecotourism, destinations enjoy the community empowerment that is associated with ecotourism because the tourism "product" is tailored to fit the local capacities of the destination (Weaver & Lawton, 2007).

Dolnicar and Matus (2008) sought to discover the characteristics of ecotourists that set them apart from others in the tourism industry for the purpose of creating a set of selective marketing techniques that can be used to attract this segment. They found significant differences between tourists with a Small Environmental Footprint and the Medium and Large Environmental Footprint groups in multiple categories. One such difference that is worth noting was the financial characteristics of ecotourism participants – the Small Environmental Footprint sector reported having low annual incomes as well as representing the most financially conscious travel segment of the three (Dolnicar & Leisch, 2008). The financial information of environmentally conscious tourists combined with their contribution to the global tourism expenditure should serve as suggestion to the immense size of the segment.

In spite of the research, very little is known about the characteristics of participants within the ecotourism niche. Market studies have been conducted to better discover who this environmentally sensitive traveler is in terms of demographics and other characteristics, but the studies have shown that tourists cross in and out of the 'green tourism' spectrum a number of times and that most tourists will fall into that classification at some point in their traveling lives.

In addition, inconsistent behavioral recording results in a lack of a coherent understanding of the group. There are too many studies using different measures to understand the segment (Bergin-Seers & Mair, 2009; Dolnicar & Matus, 2008). Though an understanding of this segment has been elusive to researchers, marketers are reaching them for an estimated global market of \$335 billion annually (Arlen, 1995).

One approach to understanding ecotourists has been to examine consumers based on lifestyle. In particular, the pro-environmental behaviors of consumers who engage in outdoor recreation activities have been examined. The next section reviews what is known about outdoor recreation and pro-environmental consumer concerns and efforts.

Outdoor Recreation and Pro-environmental Consumer Efforts

Dunlap and Heffernan (1975) found strong associations between participation in selected outdoor recreation activities and environmental concern. Consumptive recreation was defined as activities that provide the user with products, like hunting and fishing. Non-consumptive or appreciative recreation consisted of experience-based activities (camping, hunting and visiting parks). Fishing was categorized as a consumptive activity because it consumed resources, which suggested a lack of appreciation for natural environment. This categorization has caused 35+ years of controversy.

A study conducted by Dawson and Lovelock (2008) supports the findings of research by Dunlap and Heffernan (1975). Marine tourists to New Zealand completed a survey aimed at finding the environmental value and behavior levels of sea-kayaking tourists (non-consumptive) versus those of sea-angling tourists (consumptive). Research showed that non-consumptive recreationists held higher environmental value levels and behavior levels. Rennicks (1997) suggests eco-tourism efforts can be fostered by targeting less consumptive outdoor recreationists

like kayakers, hikers, and bird watchers. Further, Thapa (2010) found that participants of consumptive recreational activities are likely to have a weaker commitment to environmental sustainability than participants in appreciative recreational activities.

On the other hand, Geisler, Martinson, & Wilkening(1977) found evidence that suggests individual characteristics (e.g., age, gender, education, income) accounted for more of the variation in environmental concern than participation in outdoor recreation activities. Similarly, Pinhey and Grimes (1979) found individual characteristics were more efficient predictors of environmental concern than level of involvement or type of outdoor recreation activity. Theodori et al. (1998) extended the research to examine whether participation in outdoor recreation activities affected pro-environmental behaviors (e.g., contributing time or money to an environmental or wildlife groups; engaging in political action to protect the environment). While they found support that participation in outdoor activities was positively related in pro-environmental behaviors, they did not find a difference between the consumers who were engaging in outdoor recreation activities that had been previously categorized as consumptive and those that had previously been categorized as appreciative/non-consumptive.

Additional research suggests categorizing activities as consumptive or non-consumptive oversimplifies a complex issue. For example, Teisl and O'Brien (2003) suggest specific activities should be analyzed individually instead of under a heading like consumptive or appreciative. They found that hunting and fishing, which are commonly categorized as consumptive, differ on two out of four measures of environmental efforts. One of the measures suggested that people who participated in fishing were significantly more likely to purchase an environmentally labeled wood product than people who hunted. Snowmobiling, wildlife photography, and wildlife watching had the strongest relationships with interest in how a forest

is managed, but hunting, hiking and fishing had a significantly higher interest in how a forest is managed than people who do not participate in outdoor activities.

Bright and Porter (2001) note that the relationship between recreation participation and environmental concern is more complex than originally thought because doing the same thing (fishing and hunting) can mean different things to different people. Their results suggest recreation should not be used exclusively to predict environmental concern. The authors found support for a model that suggests recreation meaning fully mediates the relationship between wildlife participation and environmental concern.

Regardless of which side of the debate the researchers fall on, some conflict in the literature still exists. With that in mind, this study looks at the consumptive nature of outdoor recreation activities as a spectrum. Outdoor recreation activities that are on the lower level of the consumptive spectrum are expected to be an indicator of environmental concern and pro-environmental behaviors. The literature indicates that although fishing is typically at the higher end of the consumptive spectrum, fly fishing may be at the lower end of the spectrum. Therefore, the study looks past meaning to investment as an indicator of involvement in the activity. It predicts:

H1: Consumptive fly fishing behavior is negatively related to pro-environmental behaviors.

The study looks for evidence to support or refute the idea that fly fishers are in the same value/behavior category as other, more consumptive fishermen. Research suggests fly fishers are more accurately depicted as environmentally responsible, particularly as their level of specialization and involvement in the activity increases.

Fly Fishing Specialization and Pro-environmental Consumer Efforts

The level of pro-environmental efforts is likely to depend on the fly fisher's level of specialization. Bryan (1977) first introduced the concept of Recreation Specialization in the literature and defines the term as "a continuum of behavior from the general to the particular, reflected by equipment and skills used in the sport and activity setting preference" (p. 175). This definition is consistent in more recent literature (Cottrell, Graefe, Confer, 2004; Needham, Sprouse, & Grimm, 2009). When Bryan (1977) first introduced his theory of Recreation Specialization, he discussed the recreationists progression of involvement that he saw leading up to 'specialization'. Bryan's (1977) theory provides that a recreationist begins their sporting career as a beginner, though with experience they acquire more equipment specific to their sport and become more skilled, leading to a higher degree of specialization; a specialized recreationist may sometimes center their lives and their identities around their sport or hobby (Bryan, 1977). Sustained involvement in a recreational activity is fueled by the reinforcement of repeated success, the recognition of others engaging in the activity, and by the continual seeking of new challenges and solutions (Tsaur & Liang, 2008).

Bryan (1977) noted that for each of the different stages of involvement he observed, the participants' preferences and behaviors varied greatly. Fly fishers were the most specialized among trout fishermen. Specialization is important in this context because in his study of trout fishermen, Bryan (1977) found that the more specialized anglers [fly fishermen] typically supported habitat management for the purpose of maintaining healthy wild fish populations, catch and release policies were favored as fish were rarely kept anyway, even large ones.

The theory of Recreation Specialization continues to be studied extensively within the realm of water usage and water sports: river use by Kuentzel & McDonald (1992), boating by

Cottrell, Graefe, & Confer (2004), canoeing by Wellman (1982), white-water rafting/kayaking Bricker & Kerstetter (2000), and fishing by Fisher (1997) and Needham, Sprouse, and Grimm (2009). The theory has also been used by developing researchers within the domain of graduate theses: Bireline (2005) applied the theory to birdwatchers and McKinney (2011) used specialization to classify Pennsylvania steelhead fishermen.

The body of research supports the idea that as a recreationist progresses through the involvement levels, there is a strong relationship between specialization and environmental concern. Dawson and Lovelock (2008) identify the consumption of equipment as a characteristic more related to consumptive recreation tourists than appreciative recreation tourists. Further, they found that participants of non-consumptive recreational activities are more likely to have a higher participation rate in environmentally sensitive activities, while participants of consumptive activities have a higher participation rate in environmentally insensitive activities. The same study also found that there was a higher degree of specialization among the consumptive recreationists – indicated by a higher propensity to own the equipment necessary to perform their respective activities.

Research suggests that the more specialized a recreationist becomes, the more aware they are of their environmental impact resulting in more concern with reducing their negative impact on the environment Ditton, Loomis, & Choi, 1992; Fisher, 1997. In a study conducted by Oh and Ditton (2008) a link between recreation specialization and willingness to pay for conservation support was identified. Results of their research on anglers showed that conservation support was greater among the more specialized groups. Additionally, Bryan (1977) observed that “Specialist fishermen are likely to center their leisure time, vacation and otherwise, around fishing” (p. 184). His research found that general vacation patterns of

specialized anglers show an extended vacation period, 42% and 49% of cases as opposed to 15% and 26% among the non-specialized anglers (Bryan, 1977). Testing specialization theory using a market segmentation approach, Romberg (1999) found that 66% of non-resident fishermen in Alaska could be classified as specialized. Therefore, it is important to understand the tourism behavior of fly fishers, who are represented as environmentally friendly in the literature. Based on the existing research, the study tests hypothesis 2:

H2: Involvement in fly-fishing is positively related to pro-environmental behaviors.

The study also looks for insights into whether participation in fly fishing makes consumers a desirable target for sustainable travel.

Fly Fishing and Tourism

Tourism is a large aspect of the fly-fishing industry. On average, fly-fishers travel over an hour from home for approximately 45% of fishing trips and trips involving a full day or more of travel constitute approximately 17.4% of all fly-fishing trips (Recreational Boating and Fishing Foundation, and Outdoor Foundation, 2011). Contributing to this understanding, Bryan (1977) found that the specialized anglers (Technique Specialists and Tech-Setting Specialists) in his study would travel to trout destinations outside of their home geographic region for 59% and 63% of cases.

According to the 2006 U.S. census, anglers (fly-fishers and non-fly-fishers) spent \$17.9 billion (43% of all fishing related expenditures) on fishing trip-related expenses annually (U.S. Department of the Interior, Fish and Wildlife Service, and U.S. Department of Commerce, U.S. Census Bureau). In 2006, 30 million American anglers spent a reported \$42 billion on travel expenditures for fishing trips alone (Recreational Boating and Fishing Foundation, and Outdoor

Foundation, 2011). Therefore, the fly fishing lifestyle segment is important to tourism, in general.

In an article about fly fishing as a form of religious pursuit, Samuel Snyder (2007) notes that anglers refer to rivers as their church, this mentality can drive an ethic of environmental concern. Fly fishers travel all around the world to catch exotic fish in exotic locations and master that local elusive species. Because the increased expenditures associated with travel for fly fishing suggest a higher level of recreation specialization, one could argue that fly fishers who travel would have higher levels of environmental concern. However, given the environmental cost of transportation to remote locales, one could also argue the opposite is true. Does their environmental concern travel with them? This study aims to answer that question as it investigates pro-environmental behaviors among fly fishermen that travel.

Due to the conflicts in the existing literature, the existing relationships between travel for fly fishing and pro-environmental behaviors are not clear. Therefore, the current study suggests travel for fly fishing is related to pro-environmental behaviors, but does not specify the direction of the relationship. In the same way, the current study suggests environmental values affect travel choices for fly fishers. However, it does not predict how environmental values will affect travel choices. Therefore, hypotheses three and four are:

H3: Travel for fly fishing is related to pro-environmental behaviors.

H4: Environmental values affect travel choices for fly fishers.

In order to understand the environmental and travel behaviors of fly-fishermen, a survey was conducted to test the four hypotheses.

CHAPTER 3: METHODOLOGY

Summary of Hypotheses

Fishing sometimes has a negative image and is perceived as a consumptive sport because some anglers take fish from their habitats with little regard for the fish or its environment. To understand the relationship between participation in fly fishing as an outdoor leisure activity and pro-environmental behaviors, a survey was created using existing scales from green consumerism and tourism research. The survey was administered to fly fishers to test four hypotheses:

H1: Consumptive fly fishing behavior is negatively related to pro-environmental behaviors.

H2: Involvement in fly-fishing is positively related to pro-environmental behaviors.

H3: Travel for fly fishing is related to pro-environmental behaviors.

H4: Environmental values affect travel choices for fly fishers.

Survey Instrument

Using the four primary research questions, a draft survey was formed incorporating questions adapted from the reviewed literature. The questions were designated by the research question they sought to explain and analyzed to ensure that each held a singular purpose, apart from the others. This activity was to streamline the research instrument so that it may be a manageable length with regard to time necessary for completion by respondents.

When a working version of the instrument was completed, a pilot survey of fly fishermen and industry professionals was conducted among local fly fishing shop employees and customers. This step was to ensure that questions were properly constructed. The feedback received helped shape the final version of the survey used for the research collection.

The survey instrument was designed to include five major topic areas in this order: Environmental Values & Behaviors, Consumptive Orientation, Fly Fishing Travel (sub-topic of specialization), Recreation Specialization, and Demographics [of fly fishermen in North Carolina].

Environmental Values

Beyond the current literature, a further understanding of fly fishermen as a contributor to ‘green consumerism’ is sought using the Environmental Propensity Framework (EPF), developed by Oliver and Rosen (2010). The EPF brings together two dimensions of environmental consideration within consumerism: Environmental Values and Environmental Self-Efficacy. For the purposes of this study, the portion of the EPF that discovered these two dimensions among consumers was extracted from the complete scale and used as developed by Oliver and Rosen with zero adaptation (Oliver & Rosen, 2010, p. 385). The seven item Environmental Values scale was used to test hypothesis four. The three item Environmental Self-Efficacy scale was captured to test as a potential covariate.

Table 1: Environmental Propensity Framework

Environmental Values	
When I buy products, I try to consider how my use of them will affect the environment	Oliver and Rosen (2010)
I buy environmentally friendly products frequently	
I often think about the harm we are doing to our environment	
The whole environmental issue is very important to me	
I am a person who cares about the environment	
I think of myself as an environmentalist	
I often worry about the effects of pollution on myself and my family	
Environmental Self-Efficacy	
It is worthless for the individual consumer to do anything about pollution (-)	Oliver and Rosen (2010)
Since one person cannot have any effect upon pollution and natural resource problems, it doesn't make any difference what I do (-)	
Each person's behavior can have a positive effect on society	

*Five point scale items anchored by 1 = Strongly Disagree and 5 = Strongly Agree
(-) means the item was reverse coded*

Consumptive Orientation

Many researchers have studied the consumptive nature of outdoor activities and many scales have been developed to understand the many factors that lead to a recreationist's consumptive pattern. For the purpose of his doctoral dissertation, Graefe (1980, p. 39) developed a scale, "Items Used to Measure Hypothesized Dimensions of Fishermen's Consumptive Orientation", that sought to measure the factors that contribute to a fisherman's consumptive orientation. This scale is comprised of four dimensions that test various contributors to consumption, or non-consumption among anglers. The four dimensions developed were Number of Fish Caught, Type of Fish Caught, Disposition of Catch, and General Orientation to Catching Something.

Anderson, Ditton, and Hunt (2007) adapted the General Orientation to Catching Something section (Graefe, 1980) to be used in their work on the importance of the "the catch" for fishermen. This study selected one of these dimensions to contribute to our understanding of the catch-and-release pattern seen anecdotally among fly fishermen. The 'Attitudes toward Retaining Fish' dimension adapted by Anderson, Ditton, and Hunt (2007) ['Disposition of Catch' (Graefe, 1980)] was again adapted to capture anglers' behaviors as opposed to attitudes. The additional item about fishing with barbless hooks was part of the adaptation since barbless hooks are least likely to harm fish, this is important to individuals planning to release all catches.

Table 2: Attitudes toward Retaining Fish

Attitudes toward Retaining Fish	
I fish catch and release only waters	Adapted from Graefe (1980); Anderson et al. (2007)
I release the fish I catch	
I begin each trip with a plan to release all catches	
I begin each trip with a plan to keep all catches (-)	
I fish with barbless hooks	Additional Item

*Five point scale items anchored by 1 = Never and 5 = Always
(-) reverse-coded*

Recreation Specialization

Since Bryan (1977) first introduced his research involving recreation specialization among trout fishermen the research around his theory has grown and been adapted to capture the factors contributing to specialization within many outdoor recreation settings. The theory continues to be studied extensively within the realm of water usage and water sports: river use by Kuentzel and McDonald (1992), boating by Cottrell, Graefe, and Confer (2004), canoeing by Wellman (1982), white-water rafting/kayaking Bricker and Kerstetter (2000), and fishing by Fisher (1997) and Needham, Sprouse, and Grimm (2009). The study has also seen popularity among developing researchers within the domain of graduate theses: Bireline (2005) applied the theory to birdwatchers, McKinney (2011) used specialization to classify Pennsylvania steelhead fishermen, and the theory is being employed here to better understand North Carolina fly fishermen.

To utilize the expanding research in recreation specialization, various components of four scales were compiled to amass a scale adaptation that would be able to grasp an understanding of the North Carolina fly fisherman. These scales (Table 3) came from the works of McFarlane (1994), McKinney (2011), and Wellman (1982).

Table 3: Recreation Specialization

Experience	
What year did you start fly fishing? (Years of experience calculated by taking 2012-year) (1)	McKinney (2011)
Equipment and Economic Commitment	
Approximately how much have you spent on fly fishing equipment and gear (travel expenses excluded). (1)	McFarlane (1994) McKinney (2011) Wellman (1982)
Please indicate below about how much you spend annually on fly fishing gear and tackle. (2)	Wellman (1982)
Expenditures on Travel for Fly Fishing	
Please indicate below about how much you spend annually on fly fishing travel expenses. (2)	
Centrality to Lifestyle	
Average distance travelled (3)	McKinney (2011)
Typical area travelled to (4)	

1- Open-ended question

2- Six-category question. Items include: *Less than \$100. \$101 – \$250. \$251 – \$1,000. \$1,001 – \$2,500. \$2,501 – \$5,000. Greater than \$5,001.*

3- Five-category question. Items include: *Less than 10 miles. 11 miles – 25 miles. 26 miles – 50 miles. 51 miles – 100 miles. Greater than 100 miles.*

4- Four-category question. Items include: *Within 200 miles of home. Within home geographic region. Out of geographic region. Internationally.*

Environmental Action

To understand the Environmental Actions of fly fishermen, this study focused on the participation of anglers in organized conservations events. This specific focus was chosen due to the commitment level associated with contributing to such efforts. Providing these specific Environmental Action initiatives should limit the number of respondents to just those that act beyond the level of convenience.

Story and Forsyth (2008) used a similar approach in their study of the environmental behaviors as ‘helping behaviors’ with regard to community resident’s actions toward the protection of their local watershed areas. Using the theory that awareness of threats to the stream and its overall condition would lead to action toward its protection, the authors rationalized that residents living near these water bodies are more likely aware of its condition and therefore more

likely to act for its protection (Story & Forsyth, 2008). Using this foundation, directed toward watershed recreationists rather than nearby residents, this study asks fly fishermen adapted questions to understand Environmental Action.

Table 4: Environmental Action

Environmental Action	
I participate in local river clean up events	Story and Forsyth (2008)
I participate in regional river clean up events	
I donate my time to conservation efforts	

Five point scale items anchored by 1 = Never and 5 = Always

Demographics

The final portion of the survey gathered information about the respondent's demographics. The items asked respondents to report their gender; zip code; age; ethnicity; education; 2011 gross annual income; and employment status. The analysis examined these demographic variables as potential covariates based on previous research by Nord, Ludloff, and Bridger (1998) and Berger (1997) that found demographic variables are related to environmental action.

Table 5: Demographics

Gender (1)	Schneider (2010)
Zip Code (2)	
Age (2)	
Ethnicity (3)	
Education (4)	
Gross Annual Income (5)	
Employment Status (6)	

-
- 1- Three-category question. Items include: *Male. Female. Prefer not to answer.*
 - 2- Open-ended question.
 - 3- Eight-category question. Items include: *African American/Black. Asian. Caucasian/White. Hispanic/Latin American. American Indian/Native American/Alaska Native. Native Hawaiian/other Pacific Islander. Mixed (Please specify ___). Other (Please specify ___)*
 - 4- Eight-category question. Items include: *Some High School. High School Diploma/GED. Associate Degree, 2 year college. Bachelor Degree, 4 year college. Master Degree. Doctorate. Other. Prefer not to answer.*
 - 5- Nine-category question. Items include: *Less than \$35,000. \$35,000 - \$49,999. \$50,000 - \$74,999. \$75,000 - \$99,999. \$100,000 - \$149,000. \$150,000 - \$199,999. \$200,000 - \$249,999. Greater than \$250,000. Prefer not to answer.*
 - 6- Six-category question. Items include: *Student. Employed Part-Time. Employed Full-Time. Retired. Unemployed. Other, please explain ___.*

Descriptive Questions

These questions were created for the purpose of further describing the fly fisherman who fishes in North Carolina and to look for differences between fishermen based on the type of fish they pursue most frequently when they travel. The question about accommodations was used to test hypothesis three, which sought differences in travel behaviors between fly fishermen who were more/less consumptive.

Table 6: Descriptive Questions

When you travel to fly fish, where you typically stay? (1)
What type of fish do you most frequently travel for? (2)

- 1- Five-category question. Items include: *Luxury fishing lodge. Hotel/motel. Minimalist fishing cabin. Camp. Other (please specify)___.*
- 2- Four-category question. Items include: *Warm water species (Bass, Red Drum, Tarpon, Permit...). Cold water species (Trout, Steelhead, Salmon...). Salt water species (Drum, Tarpon, Permit...). Other, please describe: ___.*

Data Collection Process

After testing the survey for flow and readability, necessary edits to the survey were made and the data collection process began. The instrument was created using Qualtrics online data collection software. Using this program, the data respondents were able to freely access the survey at any convenient time for them and their responses were automatically saved for export of the data to the data tabulation software used.

The web link to the survey was disseminated to the North Carolina fly fishing community through various mediums. Using a convenience sample, the survey was sent to fly fishing clubs and organizations in the state of North Carolina as well as retail outlets that cater to fly fishermen and women. Fly fishers known to the research team were contacted directly and asked to participate in the study as well as share the web link for the survey to other North Carolina fly fishermen that they knew. To reach fly fishers who may be disconnected from the contact point previously utilized in the data collection process, a general posting was crafted to be posted to Facebook pages that fly fishers would frequently visit. The posting contained a link to the survey and a disclaimer that the study was targeting North Carolina fly fishers only.

The study was conducted over a six-week period, beginning Friday, March 2, 2012 and ending Friday, April 13, 2012. As a result of a low response rate after the first week of the data collection process, the online survey was printed and copies were placed at three North Carolina fly fishing retailers. The Great Outdoor Provision Company received twenty-five survey copies in two shop locations: Greenville, NC and Raleigh, NC. The Orvis Company received twenty-five copies in their Raleigh, NC shop location. Between these three locations for hard-copy survey collection, an additional twenty-nine responses were collected. These survey copies were delivered in person to the individual shops on different dates: The Orvis Company and the Great

Outdoor Provision Company in Raleigh, NC received their copies on Monday, March 12, 2012 and the Great Outdoor Provision Company in Greenville, NC received their copies on Saturday, March 10, 2012. On Friday, April 13, 2012 the online survey was closed to additional responses and each of the three retailers were called and asked to collect and hold any remaining survey copies with the completed copies. All paper surveys were collected Saturday, April 14, 2012 and the information provided by respondents was uploaded to the data analysis software, SPSS 19.0, for analysis.

CHAPTER 4: RESULTS

Sample

Eighty-two respondents completed the survey. Most of the respondents were male (86.6%) and white (93.9%). The mode for household income in 2011 was \$50,000-\$74,999. Sixty-two of the 82 respondents had a Bachelor's degree or higher and 72% were employed full-time.

For the fishing questions, 53.7% of respondents traveled most frequently for cold-water species of fish. Sixty one percent of respondents were members of a fly fishing group that promotes conservation. Thirty-nine respondents filled in the open-ended request for their total amount spent on fly fishing equipment and gear (excluding travel). The average total amount spent on fly fishing expenditures was \$15,063 ($SD = \$21,724$). Seventy-nine respondents filled in the number of years fly fishing. The average years were 17.8 ($SD = 14.13$).

Hypothesis Testing

Hypothesis One

Hypothesis one suggests consumptive fly fishing behavior is negatively related to pro-environmental behaviors. First, the five attitude toward retaining fish items and the three environmental action items were tested for convergent validity using Cronbach's alpha to test the internal reliability of the measures. Four of the five measures of attitude toward retaining fish were retained based on their internal reliability ($\alpha = 0.80$) and averaged to make an attitude toward retaining fish score. The four items that were retained were *I release the fish I catch; I fish with barbless hooks; I begin each trip with a plan to release all catches; and I begin each trip with a plan to keep all catches*. The three items in the environmental action scale (*I participate in local river clean up events; I participate in regional river clean up events; I donate*

my time to conservation efforts) were uni-dimensional and reliable ($\alpha = 0.84$) and were averaged to make an environmental action score.

To test hypothesis one, environmental action was regressed on attitude toward retaining fish. Household income, gender, education, and number of years fly fishing were controlled for as covariates. The overall model was significant, $F(5, 73) = 2.825, p = .02$, and explained 16.2% of the variance in Environmental Action. Attitude toward retaining fish had a significant positive relationship with Environmental Action, $\beta = .22, t(72) = 1.99, p = .05$. Number of years fly fishing, $\beta = .29, t(72) = 2.44, p = .02$, and gender, $\beta = .24, t(72) = 2.14, p = .04$, were significant covariates and had positive relationships with environment action, which suggests respondents who fly fished for more years and women were more likely to engage in environmental action. Education and household income were not significantly related to environmental action (Table 7).

Table 7: Environmental Action and Fly-Fishing Consumptiveness

Variables	Standardized Beta	t-value	Probability
<i>Independent Variable</i>			
Attitudes toward Retaining Fish	.22	1.99*	.05
<i>Covariates</i>			
Annual Household Income	-.18	-1.48	.14
Gender	.24	2.14*	.04
Education	.13	1.16	.25
# of Years Fly Fishing	.29	2.44*	.02
<i>Overall Model</i>		$R^2 = .16$	$F(5,73) = 2.83$

* $p < 0.05$

Additional Analysis

Additional analysis compared attitude toward retaining fish and environmental action across the different types of fly fishermen (fly fishers for cold water species; warm water species; salt water species). The results indicate significant differences in environmental action

between the different types of fishermen, $F(3, 78) = 4.09, p < .01$, and marginally significant differences between different types of fisherman on attitudes toward retaining fish, $F(3,78) = 2.310, p = .08$. Fly fishermen who sought cold water species (trout, steelhead, salmon, $M = 2.71, SD = .96$) had a significantly higher environmental action scores than fly fishermen who pursued warm water species (bass, striped bass, bluegill, $M = 1.80, SD = .77$). Fly fishermen who sought cold water species also had the highest attitudes toward retaining fish ($M = 4.159, SD = .73$), while those who pursued salt water species had the lowest attitudes toward retaining fish ($M = 3.645, SD = .87$).

Hypothesis Two

To test hypothesis two, which suggests involvement in fly fishing is positively related to environmental action, the scale for involvement was evaluated for convergent validity by using Cronbach's alpha as a measure of reliability. However, the three items used to capture involvement (*Please indicate how much you spend annually on fly fishing gear and tackle; Approximately how much have you spend on fly fishing equipment and gear (travel expenses excluded) ...; Number of years fly-fishing*) were not reliable. Therefore, the individual relationship between each item and the environmental action score was examined in a bivariate correlation. Only one of the two-tailed Pearson Correlations was significant at $p < .05$: there was a positive relationship between environmental action and annual expenditures on fly fishing equipment, $r(72) = .27, p < .01$ (Table 8). The sample that responded to the total investment in fly fishing was limited, with less than half of respondents completing the open ended item. Therefore, there is partial support for hypothesis two.

Table 8: Involvement and Environmental Action

	1.	2.	3.	4.
1. Environmental Action	1.00	.27*	-.03	-.01
2. Annual Investment in Fly Fishing		1.00	.44**	.15
3. Total Investment in Fly Fishing			1.00	.37*
4. Number of Years Fly Fishing				1.00

* $p < .05$

** $p < .01$

Hypothesis Three

Hypothesis three suggests travel for fly fishing is related to environmental action. To test hypothesis three, environmental action was regressed on annual expenditures on fly fishing travel. Household income, gender, education, and number of years fly fishing were controlled for as covariates. The overall model was marginally significant, $F(6, 72) = 2.11, p = .06$, and explained 15.0% of the variance in environmental action. Amount spent annually on fly fishing travel did not have a significant relationship with environmental action, $\beta = .21, t(71) = 1.672, p = .10$, but the relationship was marginally significant ($p < .10$). The number of years fly fishing, $\beta = .25, t(71) = 2.03, p = .05$, and the gender, $\beta = .29, t(71) = 2.51, p = .01$, were significant covariates and had positive relationships with environmental action, which suggests respondents who fly fished for more years and women were more likely to engage in environmental action. Education, length of trip and household income were not significantly related to Environmental Action (Table 9).

Table 9: Environmental Action and Fly-Fishing Travel Expenses

Variables	Standardized Beta	t-value	Probability
<i>Independent Variable</i>			
Expenditures on Fly-Fishing Travel	.21	1.67	.10
<i>Covariates</i>			
Annual Household Income	-.19	-1.57	.12
Gender	.29	2.51	.01
Education	.10	.91	.37
# of Years Fly Fishing	.25	2.03*	.05
Length of Trip	-.09	-.76	.45
<i>Overall Model</i>		$R^2 = 0.14$	$F(6,72) = 2.11$

* $p < .05$

Additional Analysis

To gain additional insights, those who travel for fly fishing were combined into two groups: fly fishers who stayed in lodges and hotels and fly fishers who stayed in a cabin or campground. The dependent variable was environmental action. Respondents who stayed in a campground or cabin ($M = 2.30$, $SD = .74$) had higher environment action ratings than those who stayed at a lodge or hotel ($M = 2.78$, $SD = 1.07$); the difference was marginally significant, $F(1, 41) = 2.98$, $p = .09$, $R^2 = .09$.

Hypothesis Four

Hypothesis four suggests environmental values affect travel choices for fly fishers. The seven items of the environmental values scale were uni-dimensional and reliable ($\alpha = 0.89$) so the items were averaged to create an environmental values score for each respondent. Pearson correlations between the environmental value score and distance traveled to fly fish, whether the respondent travelled on an overnight fishing trip, length of the overnight fishing trip, and time spent fishing while travelling were not significant ($p > 0.40$).

The annual amount spent on travel for fly fishing (dependent variable) was also regressed on environmental values (independent variable). In addition to the covariates previously used

(education, gender, income, number of years fly fishing), trip length was also controlled for as a covariate. The overall model was significant, $F(6, 58) = 2.344, p = 0.04$, and explained 19.5% of the variance in fly fishing travel expenditures. However, environmental values was not a significant predictor of fly fishing travel expenditures, $\beta = .55, t(57) = 0.41, p > .50$. Only the covariate trip length had a significant positive relationship with amount spent on travel for fly fishing, $\beta = .26, t(57) = 2.08, p = .04$ (Table 10). Therefore, hypothesis four was not supported.

Table 10: Fly-Fishing Travel Expenses and Environmental Values

Variables	Standardized Beta	t-value	Probability
Independent Variable			
Environmental Values	.55	.41	.68
Covariates			
Annual Household Income	-.07	-.58	.57
Gender	-.12	-.87	.39
Education	-.07	-.58	.57
# of Years Fly Fishing	.14	.95	.35
Length of Trip	.26	2.08*	.04
Overall Model		$R^2 = .20$	$F(6,58) = 2.34$

* $p < .05$

Additional Analysis

Additional analysis was done on the relationships between environmental values and the variables of interest. First, an ANOVA was conducted to compare the group that stayed in a lodge or hotel/motel to the group that camped/stayed in cabins. The group that camped or stayed in a cabin ($M = 4.21, SD = .63$) had higher environmental values than those who stayed in a lodge or hotel/motel ($M = 3.80, SD = .88$) that were marginally significant, $F(1, 41) = 3.05, p = .09$.

Next, one of the attitude toward retaining fish items used to capture consumptiveness (*I fish with barbless hooks*) was regressed on environmental values. The overall model was significant, $F(1, 80) = 5.89, p = 0.02$, and explained 6.9% of the variance in fishing with barbless

hooks. Environmental values had a significant t-score, $\beta = .26$, $t(79) = 2.43$, $p = 0.02$, which suggests environmental values have a positive relationship with use of barbless hooks.

CHAPTER 5: DISCUSSION

There was mixed support for the four hypotheses developed for this study. The research suggests Attitudes toward Retaining Fish (ARF) has a significant relationship with Environmental Action (Hypothesis 1). The involvement scale used to test for a positive relationship between involvement and environmental action (Hypothesis 2) was not reliable. However, one of the three measures, Annual Expenditures, had a positive relationship with Environmental Action. Hypothesis 3: *'Travel for fly fishing is related to pro-environmental behaviors'* was not supported. The measure using annual fly fishing travel expenditures was not significantly related to Environmental Actions. Hypothesis 4: *'Environmental values affect travel choices for fly fishers'* was broken into two parts. Amount Spent on Fly Fishing Travel was not related to Environmental Values. However, fly fishers who stayed in lodges and hotels had lower environmental values than those who camped or stayed in cabins.

In support of Hypothesis 1, the data show that Attitudes toward Retaining Fish to be positively related to Environmental Action among fly anglers. This measure captures a propensity to attempt to release fish unharmed. The National Park Service, since establishment, has existed to preserve the United States' wild areas as well as offer a setting for citizens and visitors to commune with and discover nature and wildlife. With specific case-based exceptions, the National Park Service prohibits the collection of geological species, plants, animals, and animal products; also prohibited is hunting. Again, with specific case-based exceptions, the National Park Service allows fishing within the parks. The reason for this seeming contradiction lies in the goals of the park service, it is possible to observe geological forms, plants, and terrestrial wildlife without collecting specimens. Testament to this is the National Park Service's mantra; "Take only photographs, leave only footprints."

However, this is not the case with fish. To study and observe the fish, they must be caught and removed from the water (Kulp, 2012). Therefore, fly fishers who are likely to release fish are engaged in behavior that is more correctly classified as appreciative than consumptive. Appreciative outdoor recreation activities “involve attempts to enjoy the natural environment without altering it” (Dunlap & Heffernan, 1975, p. 19-20). Per this analysis, fly fishing may be misclassified as “consumptive”, and should be labeled as an “appreciative” outdoor recreation activity for fly fishermen who engage in catch and release.

The type of fly fisherman (cold water, warm water, salt water) was shown to be a significantly related to Environmental Actions and Attitudes toward Retaining Fish. The analysis showed that fly anglers primarily fishing in cold water environments had the highest reports of Environmental Actions and the highest Attitudes toward Retaining Fish. This is an important finding because it suggests that anglers that are attracted to fly fishing in different areas and for different types of fish may also differ in level of environmental consciousness. As a destination manager seeking environmentally friendly travelers, the analysis suggests that all fly fishermen may be a desirable target audience, but fly fishermen who fish in cold water may be the most desirable target audience.

Hypothesis 2 was not supported. Of the dimensions that comprised Involvement, Annual Expenditures on Fly Fishing was the only individual measure that showed a positive correlation to Environmental Actions. The literature has already shown the potential for such a link. Bryan (1977) found that the two levels of specialized trout anglers he discovered both sought to preserve the fish and the natural setting in which they fished. Previous research (Tsaour & Liang, 2008) identified one of the behavioral dimension of specialization, annual expenditures of activity related equipment, is known to have a correlation to Environmental Concern. In

addition, Corraliza and Berenguer (2000) note that when environmental attitudes are strong they will lead to environmental behaviors given that the individual does not find the action to be bothersome. Reasons for the lack of relationships may be related to measurement, which is discussed in the limitations section.

Hypothesis 3 was not supported. The relationship between annual expenditures for fly fishing travel and Environmental Actions was found to be marginally significant. This would suggest that further investigation is necessary to understand this relationship. Should fly fishermen who travel for their sport prove to be a more environmentally conscious segment striving to preserve the environment, they would represent a tourist market that is highly desirable for destinations seeking to attract tourists who will protect their natural resources.

Finding that anglers with higher propensity to engage in Environmental Action ratings are more likely to either camp or stay in a cabin while traveling to fly fish would suggest that destinations seeking to attract the more environmentally conscious segment of the fly fishing market may benefit from developing lower impact accommodations. This propensity of this segment to stay in these settings could also help explain the weaker than expected relationship between annual fly fishing travel expenditures and Environmental Actions.

The analysis used to test Hypothesis 4 did not yield the expected relationship between Environmental Values and fly fishing travel expenditures. From the literature reviewed in this study, we know that anglers in the higher levels of recreation specialization place higher value on the setting in which they fish, management practices, and the 'catch' as an experience [Attitude toward Retaining Fish]. With direct regard to travel, we also know that the more specialized anglers travel greater distances to fish, suggesting a higher degree of planning and consideration for their destination than is seen among lesser-specialized anglers. Though it was not supported

in the current study, measurement limitations may have affected this result. Environmental Values of the fly fisher should have bearing on their travel planning/choices.

It was found that the fly fishermen that chose a camp/cabin over a lodge/hotel had higher environmental values. The environmental values of the fly fishermen suggest that they are apt to make additional choices that would be considered ‘pro-environmental’. The use of barbless hooks was included as an indicator of Attitude toward Retaining Fish as a refinement of the scale. However, it was also tested as an individual item and it was significantly related to the environmental values of anglers. The environmental values reported among this group are general to the environment, not activity specific. Therefore, fly fishermen whose Environmental Values are such that they will pursue environmental preservation techniques such as barbless hooks are likely to be viable candidates for marketing campaigns aimed at bringing fly fishermen to sustainable destinations with a focus on “ecotourism” activities. This group represents a highly sought after tourism participant.

Limitations

In the development of this thesis, certain limitations were discovered that should be accounted for before this study is replicated in the future. In addition to the limited convenience sample, there were some limitations with the measurement. The limitations ranged in nature from the response rate for certain questions to the clarification of expectations associated with individual questions. Six main measurement limitations were noted during the study analysis; three from the testing of Hypothesis 2 and three from Hypothesis 3.

For Hypothesis 2, the three measures used to capture involvement (*Please indicate how much you spend annually on fly fishing gear and tackle; Approximately how much have you spent on fly fishing equipment and gear (travel expenses excluded); Number of years fly fishing*)

were not reliable. The survey question “*Approximately how much have you spent on fly fishing equipment and gear (travel expenses excluded)*” had a notably low response rate, less than half of respondents completed the question. The question also should have been explained with more detail, the estimation of total expenditures may have caused inconsistent responses. It is expected that some responses included a boat purchase.

In testing Hypothesis 3, it was noted that the total sample size included in this study may have be smaller than is necessary, a larger sample would allow for stronger support of the different tests that must be run for the purposes of the analysis. Specifically, additional responses should be collected from the groups classifying as Warm water fishermen and Salt water fishermen, these groups being slightly less represented than the Cold water fishermen group provided for a skewed analysis of the data collected. There was no significant difference between type of accommodation preferred by fly fishermen and their trip duration.

One possible explanation is that the people who are most environmentally concerned are staying in lower cost accommodations, like cabins and campgrounds. This would lower their total travel expenditure, so the relationship between this proposed aspect of specialization and environmental action is not strong. Travel expenses should not be used to measure recreation specialization because there are too many factors that affect travel expenditures. Lastly, the scales chosen to form the portion of the study devoted to specialization should be reevaluated and further adapted to the topic within the scope of this study.

Although the study asked fly fishers to think about a recent trip, there may have been some challenges remembering the exact numbers of miles and/or expenditures. In addition, some respondents may have perceived travel for fly fishing as a two hour drive, while others

may have perceived travel for fly fishing as an overnight trip. This limitation may have affected which trip the respondent was thinking about when s/he responded.

A reexamination of this study should include or be developed using tourism scales that combine the physical attributes of the fly fisherman's travel (distance, duration, etc.) as well as the motivations of the fly fisherman to travel. One such scale that could be adapted to fit this study is the 'Travel Characteristics' and 'Travel Motivations' used by Mehmetoglu (2005, pp. 362-363). Also, the 'Fishing Motives' (1-4) from Graefe and Ditton (1997, pp. 436-437) would be an adaptable scale to use for this study.

The study could also be replicated with a larger sample, with more representation from fly fishermen who fish for warm water and salt water species. It would also be interesting to compare fishermen who fish using spinning rods and reels to fishermen who fly fish to see if they are different in terms of the consumptive nature of their endeavors. If so, tourism managers who were seeking environmentally friendly tourists could attempt to distinguish between the two sub-segments of fishermen in their marketing outreach.

CHAPTER 6: CONCLUSION

This study examined fly fishermen in North Carolina to understand their environmental behaviors as they relate to their travel for the sport. To achieve this, a survey was developed online and a printed copy placed at three fly fishing retailers. A convenience sample was used for the web survey to distribute the link to respondents. The data was analyzed to test four hypothesis involving travel and environmental behaviors of fly fishermen.

Not all of the hypotheses developed for this study were found to be significant, only one of the four were supported. Hypothesis 1, which suggested that consumptive fly fishing behaviors are negatively related to pro-environmental behaviors, was supported by the data. Hypothesis 2 which said a fly fisherman's involvement level in the sport is positively related to pro-environmental behaviors, was not supported in the data. Hypothesis 3, stated that fly fishing travel was related to pro-environmental behaviors was also supported. While Hypothesis 3 was marginally significant, it was not supported and should not be depended upon. Also, Hypothesis 4 which proposed that environmental values affect travel choices was not supported.

This study is important for planning purposes by industry professionals including destination managers, organization coordinators, retailers, and any business that markets/sales to fly fishermen. By having this further understanding of the fly fishing consumer, destination managers are better able to tailor their fly fishing package offerings to the consumers they target. Example: by understanding that pro-environmental behaviors are strongest among fly anglers who chose to camp or stay in cabins while traveling, a destination needs to apply less focus to that aspect of their marketing plans.

For future research, it would be interesting to replicate this study, accounting for limitations, and using a national sample. Using a national sample and attaining a larger sample size would allow for a more accurate depiction of angler behaviors. As a follow up, a similar

study could be administered to individuals directly employed in the fly fishing industry. These individuals would include those who work in fly fishing retail shops and fishing lodges, rod builders, fishing guides, and fly fishing organization managers. This follow-up study, in addition to testing the same measures and those tested on fly fishing participants in this study, could incorporate Expert Theory. The industry professionals could be asked if they intentionally pass their environmental values to the recreational fishermen and customers/clients. Similarly, the same series of studies could be applied to anglers of all techniques and experience levels to account for differences among them and compared to fly fishermen.

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APPENDICES

Appendix A: IRB Approval



EAST CAROLINA UNIVERSITY
University & Medical Center Institutional Review Board Office
1L-09 Brody Medical Sciences Building · Mail Stop 682
600 Moye Boulevard · Greenville, NC 27834
Office **252-744-2914** · Fax **252-744-2284** · www.ecu.edu/irb

Notification of Exempt Certification

From: Social/Behavioral IRB
To: [Thomas Winslow](#)
CC: [Jason Oliver](#)
Date: 2/8/2012
Re: [UMCIRB 12-000065](#)
Travel and Environmental Behaviors of Fly Fishers as Related to Sport Involvement

I am pleased to inform you that your research submission has been certified as exempt on 2/8/2012. This study is eligible for Exempt Certification under category #2.

It is your responsibility to ensure that this research is conducted in the manner reported in your application and/or protocol, as well as being consistent with the ethical principles of the Belmont Report and your profession.

This research study does not require any additional interaction with the UMCIRB unless there are proposed changes to this study. Any change, prior to implementing that change, must be submitted to the UMCIRB for review and approval. The UMCIRB will determine if the change impacts the eligibility of the research for exempt status. If more substantive review is required, you will be notified within five business days.

The UMCIRB office will hold your exemption application for a period of five years from the date of this letter. If you wish to continue this protocol beyond this period, you will need to submit an Exemption Certification request at least 30 days before the end of the five year period.

The Chairperson (or designee) does not have a potential for conflict of interest on this study.

IRB00000705 East Carolina U IRB #1 (Biomedical) IORG0000418
IRB00003781 East Carolina U IRB #2 (Behavioral/SS) IORG0000418 IRB00004973
East Carolina U IRB #4 (Behavioral/SS Summer) IORG0000418

Appendix B: Survey Instrument

Fly Fishing, Travel, and Environmental Behaviors Study

As a graduate student in the program of Sustainable Tourism at East Carolina University, I am collecting information regarding travel, environmental behaviors, and fly fishing for my thesis. The purpose of this study is to better understand the relationship between involvement in the sport of fly fishing, including travel habits, and environmental beliefs. The following survey will ask you questions in these three topic areas as well as a few demographic questions.

You must be 18 years of age or older to complete the survey. The survey will take about 5 minutes to complete, you indicate your voluntary agreement to participate by completing and returning this survey. All responses will be anonymous. If you have any questions, you may contact me at (252)813-0186, email: winslowt09@students.ecu.edu, or regular mail: RW-209 Rivers Building; Center for Sustainable Tourism, East Carolina University; Greenville, NC 27858.

I greatly appreciate your participation!

Sincerely,

Whit Winslow, MS Candidate
East Carolina University

What type of fish do you most frequently travel for? (Please choose one)

- Cold water species (Trout, Steelhead, Salmon...)
- Warm water species (Bass, Striped Bass, Bluegill...)
- Salt water species (Drum, Tarpon, Permit...)
- Other, please describe:

The following ten questions are designed to better understand your fishing motivations.

Please indicate your level of agreement with the following statements on a scale of 1 to 5 where 1 = Never and 5 = Always.

I fish catch and release only waters	1	2	3	4	5
I release the fish I catch	1	2	3	4	5
I fish with barbless hooks	1	2	3	4	5
I begin each trip with a plan to release all catches	1	2	3	4	5
I begin each trip with a plan to keep all catches	1	2	3	4	5
I participate in local river clean up events	1	2	3	4	5
I participate in regional river clean up events	1	2	3	4	5
I donate my time to conservation efforts	1	2	3	4	5
I donate money to conservation groups	1	2	3	4	5
I have written to legislators regarding	1	2	3	4	5

I am member of a fly fishing group/organization that promotes conservation. (Please choose one)

- Yes
- No

Please indicate how far you usually travel to go fly fishing in your area? (Please choose one)

- Less than 10 miles
- 11 miles - 25 miles
- 26 miles - 50 miles
- 51 miles - 100 miles
- Greater than 100 miles

How long do you usually fish when traveling in your area? (Please choose one)

- 1 hour or less
- A few hours
- Half-day
- All Day
- Multiple Days

These three questions will ask you about the manner in which you travel for fly fishing. Think about an overnight fishing trip you took within the last year.

Please skip these three questions if you have NOT taken an overnight fishing trip in the past year.

Where did you go?

- Country / State:
- Area / Location:

Where did you stay? (Please choose one)

- Luxury fishing lodge
- Hotel/motel
- Minimalist fishing cabin
- Camp
- Other (Please specify)

How long was the trip? (Please choose one)

- 2 - 3 days
- 4 days - one week
- One week - 10 days
- 10 days - 2 weeks
- Longer than 2 weeks

The following four questions are meant to gauge your involvement in the sport of fly fishing.

Please indicate below about how much you spend annually on fly fishing gear and tackle. (Please choose one)

- Less than \$100
- \$101 - \$250
- \$251 - \$1,000
- \$1,001 - \$2,500
- \$2,501 - \$5,000
- Greater than \$5,001

Please indicate below about how much you spend annually on fly fishing travel expenses. (Please choose one)

- Less than \$100
- \$101 - \$250
- \$251 - \$1,000
- \$1,001 - \$2,500
- \$2,501 - \$5,000
- Greater than \$5,001

Approximately how much have you spent on fly fishing equipment and gear (travel expenses excluded) over your life?

What year did you start fly fishing?

Please answer these next ten questions so that I may better understand your environmental concerns.

Please indicate your level of agreement with the following statements on a scale of 1 to 5 where 1 = Completely Disagree and 5 = Completely Agree.

When I buy products, I try to consider how my use of them will affect the environment

1 2 3 4 5

I buy environmentally friendly products frequently

1 2 3 4 5

I often think about the harm we are doing to our environment

1 2 3 4 5

The whole environmental issue is very important to me

1 2 3 4 5

I am a person who cares about the environment

1 2 3 4 5

I think of myself as an environmentalist

1 2 3 4 5

I often worry about the effects of pollution on myself and my family

1 2 3 4 5

It is worthless for the individual consumer to do anything about pollution

1 2 3 4 5

Since one person cannot have any effect upon pollution and natural resource problems, it doesn't make any difference what I do

1 2 3 4 5

Each person's behavior can have a positive effect on society

1 2 3 4 5

Thank you for your participation. Lastly, please answer these seven demographic questions.

What is your gender? (Please choose one)

- Male
- Female
- Prefer not to answer

What is the zip code of your primary residence?

In what year were you born?

What is your ethnicity and race? (Please choose one)

- African American / Black
- Asian
- Caucasian / White
- Hispanic / Latin American
- American Indian / Native American / Alaska Native
- Native Hawaiian / other Pacific Islander
- Mixed (Please specify)
- Other (Please specify)

What is the highest level of education you have completed? (Please choose one)

- Some High School
- High School Diploma / GED
- Associate Degree, 2 year college
- Bachelor Degree, 4 year college
- Master Degree
- Doctorate
- Other
- Prefer not to answer

What was your gross annual household income in 2011? (Please choose one)

- Less than \$35,000
- \$35,000 - \$49,999
- \$50,000 - \$74,999
- \$75,000 - \$99,999
- \$100,000 - \$149,000
- \$150,000 - \$199,999
- \$200,000 - \$249,999
- Greater than \$250,000
- Prefer not to answer

Please indicate your employment status. (Please choose one)

- Student
- Employed Part-Time
- Employed Full-Time
- Retired

- Unemployed
- Other (Please explain)

Appendix C: Additional Descriptive Statistics

Table 11: Preferred Fishing Environment

	Frequency	Percent	Valid Percent	Cumulative Percent
Cold water species (Trout,	44	53.7	53.7	53.7
Warm water species	15	18.3	18.3	72.0
Salt water species	19	23.2	23.2	95.1
Other, please describe:	4	4.9	4.9	100.0
Total	82	100.0	100.0	

Table 12: Affiliation to Conservation Organization

	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	50	61.0	62.5	62.5
No	30	36.6	37.5	100.0
Total	80	97.6	100.0	
Missing	2	2.4		
Total	82	100.0		

Table 13: Willingness to Travel in Area

	Frequency	Percent	Valid Percent	Cumulative Percent
Less than 10 miles	12	14.6	14.6	14.6
11 miles – 25 miles	14	17.1	17.1	31.7
26 miles – 50 miles	8	9.8	9.8	41.5
51 miles – 100 miles	12	14.6	14.6	56.1
Greater than 100 miles	36	43.9	43.9	100.0
Total	82	100.0	100.0	

Table 14: Overnight Trip Lat Year

	Frequency	Percent	Valid	Cumulative
No	66	80.5	80.5	80.5
Yes	16	19.5	19.5	100.0
Total	82	100.0	100.0	

Table 15: Accommodations

	Frequency	Percent	Valid Percent	Cumulative Percent
Luxury fishing lodge	3	3.7	4.3	4.3
Hotel/motel	20	24.4	29.0	33.3
Minimalist fishing cabin	4	4.9	5.8	39.1
Camp	16	19.5	23.2	62.3
Other (Please specify)	26	31.7	37.7	100.0
Total	69	84.1	100.0	
Missing	13	15.9		
Total	82	100.0		

Table 16: Trip Length

	Frequency	Percent	Valid Percent	Cumulative Percent
2 – 3 days	38	46.3	55.9	55.9
4 days – one week	15	18.3	22.1	77.9
One week – 10 days	11	13.4	16.2	94.1
10 days – 2 weeks	4	4.9	5.9	100.0
Total	68	82.9	100.0	
Missing	14	17.1		
Total	82	100.0		

Table 17: Annual Gear and Tackle Expenditures

	Frequency	Percent	Valid Percent	Cumulative Percent
Less than \$100	8	9.8	9.8	9.8
\$101 - \$250	15	18.3	18.3	28.0
\$251 - \$1,000	38	46.3	46.3	74.4
\$1,001 - \$2,500	15	18.3	18.3	92.7
\$2,501 - \$5,000	5	6.1	6.1	98.8
Greater than \$5,001	1	1.2	1.2	100.0
Total	82	100.0	100.0	

Table 18: Annual Travel Expenditures

	Frequency	Percent	Valid Percent	Cumulative Percent
Less than \$100	8	9.8	9.8	9.8
\$101 - \$250	14	17.1	17.1	26.8
\$251 - \$1,000	28	34.1	34.1	61.0
\$1,001 - \$2,500	21	25.6	25.6	86.6
\$2,501 - \$5,000	9	11.0	11.0	97.6
Greater than \$5,001	2	2.4	2.4	100.0
Total	82	100.0	100.0	

Table 19: Respondents' Gender

	Frequency	Percent	Valid Percent	Cumulative Percent
Male	71	86.6	86.6	86.6
Female	11	13.4	13.4	100.0
Total	82	100.0	100.0	

Table 20: Respondents' Ethnicities

	Frequency	Percent	Valid Percent	Cumulative
Asian	1	1.2	1.2	1.2
Caucasian / White	77	93.9	93.9	95.1
American Indian	1	1.2	1.2	96.3
Mixed	3	3.7	3.7	100.0
Total	82	100.0	100.0	

Table 21: Respondents' Education

	Frequency	Percent	Valid Percent	Cumulative Percent
Some High School	2	2.4	2.4	2.4
High School Diploma / GED	6	7.3	7.3	9.8
Associate Degree, 2 year college	10	12.2	12.2	22.0
Bachelor Degree, 4 year college	39	47.6	47.6	69.5
Master Degree	11	13.4	13.4	82.9
Doctorate	12	14.6	14.6	97.6
Other	2	2.4	2.4	100.0
Total	82	100.0	100.0	

Table 22: Respondents' Household Incomes

	Frequency	Percent	Valid Percent	Cumulative Percent
Less than \$35,000	14	17.1	17.1	17.1
\$35,000 - \$49,999	9	11.0	11.0	28.0
\$50,000 - \$74,999	16	19.5	19.5	47.6
\$75,000 - \$99,999	10	12.2	12.2	59.8
\$100,000 - \$149,000	13	15.9	15.9	75.6
\$150,000 - \$199,999	7	8.5	8.5	84.1
\$200,000 - \$249,999	4	4.9	4.9	89.0
Greater than \$250,000	1	1.2	1.2	90.2
Prefer not to answer	8	9.8	9.8	100.0
Total	82	100.0	100.0	

Table 23: Respondents' Employment Statuses

	Frequency	Percent	Valid Percent	Cumulative Percent
Student	12	14.6	14.6	14.6
Employed Part-Time	3	3.7	3.7	18.3
Employed Full-Time	59	72.0	72.0	90.2
Retired	4	4.9	4.9	95.1
Unemployed	1	1.2	1.2	96.3
Other (Please explain)	3	3.7	3.7	100.0
Total	82	100.0	100.0	

Table 24: Fishing Duration in Area

	Frequency	Percent	Valid Percent	Cumulative Percent
1 hour or less	1	1.2	1.2	1.2
A few hours	15	18.3	18.3	19.5
Half-day	18	22.0	22.0	41.5
All Day	23	28.0	28.0	69.5
Multiple Days	25	30.5	30.5	100.0
Total	82	100.0	100.0	

Table 25: Descriptive Statistics for Involvement

	N	Minimum	Maximum	Mean	Std. Deviation
Approximately how much have you spent on fly fishing equipment and gear (travel expenses excluded) o...	39	250	100000	15062.82	21724.194
# of years ff, based on 2012-year started	79	1.00	56.00	17.8228	14.13557

