AN ANALYSIS OF FLORIDA RESIDENTS' WILLINGNESS TO FINANCE PRIVATE LAND STEWARDSHIP: DEMOGRAPHIC AND PSYCHOLOGICAL FACTORS DRIVING BEHAVIOR

by

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(Under the Direction of Elizabeth Pienaar and Jeffery Mullen)

ABSTRACT

Private lands in the US are crucial for biodiversity and ecosystem services, but face challenges from development and agriculture. Shifting habitats and endangered species protection are urgent concerns. This study explored preferences of Florida residents, including hunters and anglers, for funding private land stewardship. Using a survey and Stated Preference Choice Experiment, I measured willingness to pay and assessed attitudes towards native species, flood risk, the Florida panther, and climate change. Varying values among the general public and hunters/anglers indicated preference heterogeneity. Residents positively valued most ecosystem services that private lands offered, with 96% of respondents' welfare being reduced if there was no conservation program. Demographic and psychological factors influenced preferences for funding private land stewardship. My results suggest implementing an additional fee for standard Florida license plates as a funding mechanism for private land stewardship. These insights inform policymakers in developing effective programs that respect diverse values.

INDEX WORDS: Stated preference choice experiments, Random parameters logit, Willingness to pay, Private land stewardship, Ecosystem services, Recreation, Flood risk, Habitat, Hunters, Florida

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B.S. The University of Georgia, 2022

A Thesis Submitted to the Graduate Faculty of the University of Georgia in Partial Fulfillment of the Requirements for the Degree

MASTER OF SCIENCE

ATHENS, GEORGIA

2023

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August 2023

ACKNOWLEDGEMENTS

I would like to thank my graduate committee members for their encouragement and feedback during the development of my Master's thesis. Special appreciation extends to my co-advisor, Dr. Elizabeth Pienaar, for her continued support, mentorship, and valuable expertise throughout the entire research process. I'd like to express my gratitude to my co-advisor, Dr. Jeffery Mullen, for his generosity, encouragement, and guidance throughout the program and, I'd like to thank my final committee member, Dr. Gregory Colson, for his insightful feedback and direction to improve this work. Throughout this process, I have gained substantial knowledge, and I am immensely appreciative of the time and effort that everyone has invested in me and this project. Lastly, I extend my sincerest thanks to my family and friends for their unwavering support throughout my college career and the research process.

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1.1 Importance of Private Land Stewardship

Recovery efforts for endangered species and their habitat largely depend on private landowners' stewardship efforts. In the United States (US), privately owned lands account for 99% of the nation's croplands, 61% of grasslands and pasture, 56% of forests, and provide a habitat for more than 75% of endangered species (Rodriguez et al., 2018). Thus, the management of private lands has major implications for biodiversity.

Private land stewardship is critical to securing ecosystem services and protecting endangered species and biodiversity. Ecosystem services are the processes through which natural ecosystems, and the species that make them up, provide benefits to humans (Daily, 1997). Ecosystem services include benefits such as flood protection, restoring groundwater, improving water quality, and providing recreational opportunities. Land stewardship is the management of land and resources to protect the quality of land, air, water, and biodiversity, as well as the management of this natural capital in a way that conserves all of its values (Squires, 2017). Landowners can support their operations and earn an income from livestock production and other agricultural activities, while implementing land stewardship practices that reduce soil erosion, improve wildlife habitat, and protect native vegetation. The sustainability of land use is important in ensuring that the land is used in a way that allows future generations to enjoy the benefits provided by the ecosystem. However, with poor land management practices, the value of the land decreases as the ecosystem services diminishes.

The conversion of natural lands to urban development and agricultural land are leading drivers of losses of biodiversity and ecosystem services (Kong et al., 2021). The expansion of agricultural lands and urban development contributed to approximately 90% and 10% of the habitat loss in global diversity hotspots (Kong et al., 2021). Although agricultural land may provide habitats for terrestrial species, the use of agrochemicals, agricultural mechanization, the seasonality of agricultural production, and the uncertainty in agricultural structure adjustments are not beneficial for species' populations' hotspots (Kong et al., 2021). The greatest threat to many wildlife species is the loss of habitat. Habitat loss results in population declines, especially for species that are endangered or reliant on large parcels of land (Onorato et al., 2011). In addition to the loss of habitat, habitat fragmentation can affect species' populations, especially those that are wide-ranging and have low population densities (Onorato et al., 2011). Private land stewardship is important to conserving and securing ecosystem services and native species and is increasingly critical due to an era of global environmental change.

Global environmental change is part of the Earth's functioning system. The current issue with global environmental change comes from the fact that human-caused global changes, such as changing weather patterns and increasing average global temperatures, are more frequent and rapid than the natural change of the Earth (Vitousek, 1992). The increase, from human activity, in the abundance of greenhouse gasses in the atmosphere enhances the greenhouse effect, which is a naturally occurring process that maintains the average temperature of the Earth. Higher global temperatures can cause a multitude of environmental changes, such as rapid changes in the climate, which may cause species to migrate, adapt, or become extinct (Habibullah et al., 2021).

With global environmental change, there are shifting habitats due to changes in weather patterns, ecosystems, and land use. Changes in land use by humans can alter enough of local ecosystems to transform the regional climate and major river systems (Vitousek, 1992). The changing of local ecosystems may cause certain species to become displaced from their current habitats, and shift to a region with a more suitable habitat. The alteration of local ecosystems may be the most important global effect of human-caused land use changes, causing some major ecosystem types to become significantly altered or disappear completely (Vitousek, 1992). Thus, private land stewardship has become increasingly important for managing local ecosystems and providing habitat that allows species to shift their range.

Through global environmental change, the loss of biodiversity, climate change, and other environmental changes, landscapes have become altered (Krutilla, 1967). For example, rising sea levels have led to the development of urban areas to be located farther inland to avoid potential floods and other damages caused by sea level rise (Leo et al., 2019). This has caused many wildlife species to be displaced from their local habitats and forced to shift to another region that is less suited for their survival to find necessary resources, such as food, shelter, and protection from predation (Hui, 2013). Proper land management strategies can protect land from drastically changing by supporting its ecosystem services (Rodriguez et al., 2018).

The shifting of many species' populations is also seen as a result of increased urban development. Global environmental change is driven by global economic growth, causing an influx of urban development expanding into rural areas to support a growing population with raised material and living standards (Krutilla, 1967). As urban development projects migrate into wildlands, the habitat left for local wildlife is no longer suitable due to fragmentation or the disappearance of available land (Norwood, 1999). In this case, species may have to relocate due

to the lack of available resources needed to survive or, if they have negative human-wildlife interactions, are either killed or relocated by humans (Alldredge et al., 019). Furthermore, the urbanization of local ecosystems affects the benefits of ecosystem services (Leo et al., 2019). For example, marshlands help to absorb heavy rains, redirect runoff, and prevent flooding. However, if the marshland is filled in to become an area for urban development, the ecosystem service of flood prevention is lost, making the area more susceptible to flooding and higher damage costs to properties (Ramachandra et al., 2012).

Private landowners may be tempted to sell their land for urban development or row-crop agriculture practices (Koch et al., 2019). Thus, it is important to create an incentive for land stewardship to preserve local habitats and ecosystem services. Without land stewardship, more species will have to relocate as habitats begin shifting.

1.2 Funding of Private Land Stewardship

Current incentives for land stewardship include multiple programs from the Natural Resources Conservation Service (NRCS) within the U.S. Department of Agriculture. Programs from the NRCS include the Conservation Stewardship Program (CSP), the Conservation Reserve Program (CRP), and the Environmental Quality Incentives Program (EQIP), which are funded by tax dollars. These NRCS programs primarily focus on incentivizing landowners to integrate conservation into working lands while strengthening their personal operations (*Natural Resources Conservation Service*, n.d.). Although land stewardship is funded and there are funding structures present, the current structures alone have insufficient funding to conserve the amount of land needed to sustain many native species (McBride et al., 2019). Stakeholders, including private landowners, local communities, and government and nongovernment

organizations, have regarded the lack of funding and insufficient resources as one of the key reasons for the landscapes' and its inhabitants' inability to adapt to change, from land use and global environmental change, for environmental management and conservation (McBride et al., 2019). Thus, it is necessary to look at alternative funding structures, and recognize that multiple structures are needed to aid in funding land stewardship (Alkire, 2003). An alternative source of funding for land stewardship includes voluntary payments from the public.

1.3 Private Land Stewardship in Florida

Florida is one of many regions that faces threats from global environmental change, such as shifting habitats, warmer temperatures, and increased flood risk (Reece et al., 2013). Florida's landscape includes more than 50,000 square miles of diverse natural areas: forests, swamps, flatwoods, marshes, prairies, and waterways (Whitney et al., 2004). Florida is home to upwards of 400 wildlife species, including more than 130 which are classified as imperiled (Profiles, n.d.). With insufficient funding structures to support private land stewardship in Florida, additional funding sources, such as voluntary payments from the public, would benefit the residents, the land, and the native species through land stewardship (Choe & Schuett, 2020). To engage Florida residents in funding private land stewardship, it is important to understand what attributes may be important to Florida residents that would cause them to engage in pro-environmental behavior.

To understand what it is that Florida residents care most about when deciding whether to fund private land stewardship, I focused on various ecosystem services that Florida's private lands provide. Specifically, I focused on the Florida panther, game species, flood protection, and recreational activities. I chose these attributes in order to gauge the value that Florida residents

place on certain ecosystem services, including ones whose access to and availability of may be affected by global environmental change.

The Florida panther is a prime example of a native species in Florida that is reliant on large parcels of land, is wide-ranging, and has low population density (Florida Wildlife Federation, 2022). Listed as an endangered species under the Endangered Species Act (ESA), the Florida panther's population is heavily affected by the loss of habitat due to global environmental change, urban development, and the lack of land stewardship on private lands (Florida Wildlife Federation, 2022). To delist the panther, it is required that there be three viable, self-sustaining populations each of at least 240 adults and sub adults across Florida and the southeastern United States (Kreye & Pienaar, 2015). It is also required to have sufficient habitat that is secured and protected to support the panther populations in the long run (Kreye & Pienaar, 2015).

The Florida panther is seen as a charismatic species with widespread popular appeal in Florida and plays an important role in Florida's ecosystems and food webs (Florida Wildlife Federation, 2022). The Florida panther is an umbrella species, meaning their preservation indirectly conserves other threatened and endangered wildlife in the state (Florida Wildlife Federation, 2022). Florida residents may value the panther and the service that the panther and its conservation provide to its surrounding ecosystem, such as predating on deer and conserving other wildlife including the scrub jay and gopher tortoise, therefore may desire to help conserve the species (Florida Wildlife Federation, 2022). Although the species is generally secretive, panthers provide wildlife sightings to the public on rare occasions, initiating a positive perspective toward the animal (Giuliano, 2015). On the other hand, panthers may be seen as a nuisance or threat by private landowners and people living in residential areas due to the risk of

attack on their livestock and/or pets (Rogers & Pienaar, 2018). Since the Florida panther is a predator, people may view the species as harmful and a risk to domesticated animals, humans, and/or other species people may view positively, such as deer and rabbits, in the area that the panther may prey on (Rogers & Pienaar, 2018). Global environmental change adds another dimension to the public's concern regarding the conservation of the Florida panther. Shifting habitats may cause the Florida panther to relocate to new areas that are not best suited for their survival. People in these areas may dislike the introduction of the panther and the perceived risk the animal poses to people's pets and children. Due to this risk perception, Florida residents may choose not to aid in conserving the Florida panther population. The conservation of the Florida panther is a controversial topic and residents may lean more towards or away from aiding the species to recovery, and ultimately financing land stewardship, depending on how they value the panther.

The population of game species, such as white-tailed deer, turkeys, and bobwhite quail, might also spark Florida residents' interest in choosing whether or not to finance private land stewardship. Game management involves land stewardship practices that aim to improve conditions for the game species and other wildlife and vegetation (Gamborg, 2019). Private lands can be managed to support game species and fish populations that can be hunted or fished in Florida, thus creating a desire for hunters, anglers, and animal watchers to aid in land stewardship. However, people may stray away from supporting the populations of certain game species. For example, residents may be opposed to an increase in white-tailed deer populations in fear of an increase in car collisions or the spread of diseases. In the United States, between July 2011 and June 2012, there were an estimated 1.23 million deer-vehicle collisions (Martin et al., 2020). Deer also carry tick borne diseases, such as Lyme disease, which is now the most prevalent

contagious disease in the United States with 20,000 to 30,000 cases reported annually reflecting a probable overall incidence of 300,000 new cases each year (Martin et al., 2020). In contrast, other residents may associate an increase in wildlife sightings as aesthetically pleasing and choose to support game management through land stewardship (Manfredo et al., 2002).

An increase in urban development and global environmental change can be a threat to native wildlife, including game and fish populations. With changing temperatures and weather patterns, habitats that are suitable for game and fish species are shifting, causing wildlife and fish to migrate to new areas (Hui, 2013). Due to drastic changes in the land, landowners and hunters are seeing a need for game management activities (Gamborg, 2019). Hunting game species is prevalent in Florida, with upwards of 400,000 Florida hunting licenses issued as of 2023, and it holds significant cultural importance in the region (Recreational and Commercial License Holders – Public Record, n.d.). Hunting provides an opportunity for social interaction, promotes connections within the community, and maintains cultural traditions (Arnett & Southwick, 2015). Additionally, hunting is a major income earner for wildlife agencies, hunters, and the state and has contributed significant funds to local and national economies (Arnett & Southwick, 2015). Revenues generated through hunting fees, equipment, and license fees support wildlife and habitat conservation, management, and research (Arnett & Southwick, 2015). In 2022, the U.S. Fish and Wildlife Service announced $1.5 billion in annual funding through the Wildlife and Sport Fish Restoration program to support outdoor recreational opportunities and wildlife and habitat conservation efforts (U.S. Department of the Interior, 2022). Despite the contributions from recreational activities, such as hunting, there remains a lack of funding for environmental protection in Florida and additional funding is needed (Wang, 2011). Due to the economic and environmental benefits of hunting and the community the sport creates, private

landowners and Florida residents may care for game species management and choose to finance land stewardship.

The natural lands maintained by private landowners might offer access to recreational activities, such as hunting, which would not be possible if the land was converted to urban development. Habitats supported through land stewardship provide recreational fishing on rivers, streams, and lakes. Additionally, landowners may offer the opportunity to hike for nature appreciation, birdwatching, and wildlife-watching. The opportunity for recreational activities is another ecosystem service, in addition to supporting wildlife habitats, which humans benefit from as a result of land stewardship. Florida residents may participate in recreational activities, such as hunting, fishing, and hiking, to connect with nature, spend time with friends and family, or improve their personal well-being (Rosa et al., 2019). For these reasons, a person may be inclined to finance land stewardship for the opportunity to enjoy outdoor recreational activities.

Natural lands provide ecosystem services, such as supporting native species and providing outdoor recreational activities that Florida residents may benefit from. Protection against floods is an additional ecosystem service that can be seen as a significant benefit to Florida residents, especially in an era of global environmental change. Flood risk and non-monetary consequences due to climate-induced impacts, such as sea level rise, are growing concerns among coastal communities (Bilskie et al., 2022). Extreme weather events, due to global environmental change, are increasing in intensity and frequency along the coast (Gilliam, 2021). Florida has a high coastline-to-surface area ratio, meaning the state is particularly susceptible to damages from climate-induced impacts (Gilliam, 2021). Florida's rapidly growing human population translates into more property susceptible to storm-associated damages and threatened lives (Gilliam, 2021). Additionally, growing urbanization in Florida increases runoff

volume and flood magnitudes as natural lands' flood mitigation services are lost (Brody et al., 2007). Excessive rains, storm surges, and intense flooding combine to create a serious threat to Florida residents and ecosystems (Gilliam, 2021).

Fortunately, natural lands can aid in the protection against flooding by absorbing heavy rains and redirecting runoff. If the land were otherwise converted to urban development, the ecosystem service of flood protection would be lessened, possibly causing the existing structures to incur damages and the population to relocate (Brody et al., 2007). Urban residents are particularly at risk of losing flood protection compared to rural residents (Villarreal-Rosas, 2022). The growth in infrastructure is the primary reason for declines in flood protection in the urban sector, whereas the loss of natural lands is the main driver for reduced flood protection in rural areas (Villarreal-Rosas, 2022).

Flood protection loss causes severe negative consequences, such as increased property damages and a possible threat to peoples' lives, for urban and rural populations and infrastructure (Villarreal-Rosas, 2022). Increased floods can also alter the makeup of native ecosystems, causing the habitats to become unsuitable for certain wildlife species, such as wading bird and alligators, and more suitable for other species, such as aquatic species (Catano et al., 2014). Thus, the increased risk of flooding, in addition to increased urban development and global environmental change, may cause wildlife populations to shift and relocate to more suitable habitats (Villarreal-Rosas, 2022). It is important to recognize the role that land stewardship plays in protecting urban and rural properties from global environmental change effects, as well as supporting local ecosystems and outdoor recreational access opportunities.

Although these ecosystem services may be recognized as needing support and protection, the issue continues to lie in the appropriate funding model. Florida residents do not pay a state

income tax, and many people would argue against paying additional taxes (Sussman & Olivola, 2011). In order to fund private land stewardship, the Florida public has to be willing to pay for stewardship activities. Currently, various wildlife conservation groups and hunter and angler associations in Florida are funded by fees from specialty license plates, such as the "Conserve Wildlife", "Wildlife Foundation of Florida", and "Fish Florida" plates (*License Plates,* n.d.). Since there are existing Florida specialty license plates focused on conservation and recreational programs, and some residents choose to purchase one when registering a car, it shows that some residents are willing to support this funding method for conservation and recreational programs. Over $9.8 billion has been obtained through specialty license plates for conservation efforts in Florida (Fish and Wildlife Foundation of Florida, 2022) Therefore, I focused on the additional fee for a standard license plate funding structure, specific ecosystem services provided by land stewardship, and why the services might be relevant to the public and significant within the larger context of global environmental change.

1.4 Demographic and Psychological Factors Drive Behavior

Demographic factors, such as age, gender, educational level, and race, have been shown to influence pro-environmental behavior across individuals (Fu et al., 2020). Pro-environmental behavior refers to intentional actions taken by individuals to reduce the adverse effects of their activities on the natural and built environment (Fu et al., 2020). Past studies have indicated that members of minority populations are less likely to engage in pro-environmental behavior due their historical lack of benefits from environmental programs (Whittaker et al., 2005). While local governments, real estate developers, and home buyers promote redevelopment projects and encourage new environmental practices, vulnerable urban residents, including minority

communities, can be displaced and given financial burdens due to gentrification (Anguelovski, 2015). Conversely, it has been found that younger adults, those with a higher level of education, political liberals, and urban residents possess higher environmental concerns (Jones & Dunlap, 2010). Additionally, females have been found more likely to engage in pro-environmental behavior, such as funding environmental programs, due to their higher concern with environmental issues (Tindall et al., 2003). Individuals with higher levels of disposable income are more likely to aid in financing conservation program (Raymond & Brown, 2011). People with children in their household are also more likely to engage in pro-environmental behaviors, such as supporting conservation programs, due to their bequest motive of preserving the ecosystem and its services for future generations (Kotchen & Reilind, 2000). As noted above, past research has shown evidence that demographic factors can influence pro-environmental behavior, including whether or not to help finance conservation programs. Therefore, I included questions in the survey regarding respondents' demographics to test the effect that demographic variables had on residents' willingness to finance a private land stewardship program.

In addition to demographic elements, it is important to recognize the roles that psychological factors play in influencing people's behavior, such as their surroundings, values, attitudes, beliefs, and social and cultural norms. Knowledge regarding people's underlying psychological influences is essential for understanding what drives pro-environmental behavior and reaching environmentally related goals, such as wildlife or land management strategies, including whether or not to finance private land stewardship (Decker et al., 2012). Values are defined as "desirable individual end states, modes of conduct, or qualities of life that we individually or collectively hold dear" (Decker et al., 2012). Values help show people's basic desires and goals while defining what is important to them. Typically, values are developed early

in life and culturally constructed, therefore, making it highly resistant to change (Decker et al., 2012). Three value orientations (egoistic, altruistic, and biospheric) were developed by De Groot and Steg (2010) as a measurement scale that explains values' influences over environmental attitudes, norms, and actions. Value orientations have been found to be relevant for understanding environmental beliefs and behavior (de Groot & Steg, 2010). Their study found that both altruistic, concern for the welfare of others, and biospheric, concern for non-human species and the planet, value orientations were positively related to the intention of donating to humanitarian or environmental organizations (de Groot & Steg, 2010). In contrast, egoistic values, where individuals try to maximize self-outcomes relative to power, wealth, and authority, were typically negatively related to environmental behaviors (Steg et al., 2014). Additionally, the wildlife value orientation scale was developed to describe the way that a value attains meaning for an individual (Decker et al., 2012). Values, relative to wildlife, are oriented by either domination, mutualism, pluralist, and distanced. A domination value orientation "reflects the extent which an individual's (or group's) values are shaped by a view of human mastery over wildlife", whereas a mutualism value orientation "places emphasis on equality and on individuals acting for the welfare of all" (Manfredo et al., 2009). People with pluralist value orientations share beliefs from both domination and mutualism orientations, and distanced value orientations typically feel disconnected from wildlife and do not share either mutualism or domination orientations (Teel & Manfredo, 2010).The study suggested modernization (indicated by higher income, urbanization, and education) leads to a shift from domination to mutualism value orientations (Teel & Manfredo, 2010).

Values and value orientations have been found to help explain people's attitudes towards wildlife and wildlife-related topics, particularly between explaining the variation on issues

involving harm to wildlife and trade-offs between wildlife protection and human interests (Teel & Manfredo, 2010). The theory that behavior is influenced by a "series of interrelated cognitions arranged in a hierarchal fashion" places values as the foundation of forming attitudes within an individual (Teel & Manfredo, 2010). Attitudes are defined as the "association of an evaluation and an object in memory" and can directly influence behavior (Teel & Manfredo, 2010). By understanding people's attitudes, predicting people's behaviors towards management strategies can become more accurate. There are two dimensions to attitudes: an evaluative component and a cognitive component. The evaluative component relates to the positive or negative association the individual places on an object, such as the Florida panther, recreational access, or flood protection, whereas the cognitive component refers to the beliefs relating to the attitude object (Decker et al., 2012). People's attitudes include their risk perceptions, for example their concerns towards an increased population of the Florida panther, a large carnivore. Past research has described the conservation of large carnivores as complicated due to their perceived and real danger to human safety, livestock, and pets (Miller et al., 2013). Thus, I aimed to incorporate questions and attributes, such as the ESA status of the Florida panther, into a survey that would capture Florida residents' values and attitudes, including their risk perceptions and concerns. Understanding people's preferences towards the attributes connected to private land stewardship can help accurately predict their behavior when deciding whether to finance land stewardship. Therefore, in addition to the Florida panther, I included questions regarding flood risk, a growingly discussed issue in Florida, to capture people's risk perceptions. Past research shows people with high risk perceptions pertaining to an increased flood risk are more willing to engage in mitigation strategies (Botzen et al., 2009). Native species and game species, as well as outdoor recreational opportunities, were included to assess people's preferences towards wildlife and

nature. Furthermore, despite the pressing necessity for addressing climate issues, there is denial of climate change and the consequent lack of pro-environmental behaviors, such as engaging in conservation or mitigation strategies, among some individuals (Wullenkord & Reese, 2021). Since Florida is experiencing the effects of global environmental change, including flood events, severe storms, warmer temperatures, and habitat displacement, I wanted to capture residents' risk perceptions on the impacts of climate change and how their preferences might vary towards program attributes, such as flood risk reduction, support of wildlife and habitat, and recreational opportunities, if language surrounding climate change was included or not in the survey (Reece et al., 2013).

In addition to people's values and attitudes, social and cultural norms and communities also play a major role in directing behavior. Personal norms are defined as self-expectations, sanctions, and obligations that are rooted in internalized values and are connected to decision-making (Kim & Seock, 2019). Cultural and social norms refer to the expected standards of behavior shared among a particular cultural group and aid in forming a sense of community among individuals with the same values and standards of behavior (Decker et al., 2012). Therefore, I wanted to incorporate a separate population of hunters and anglers to assess how their decision-making differed due to their values and beliefs, pertaining to wildlife, hunting activities, climate change, and financing private land stewardship, or remained the same compared to the general public of Florida. Although some studies have revealed hunters to have a weaker pro-environmental identity, such as less willing to support environmental programs, and a stronger domination value orientation, other studies have suggested hunters' increased connection with nature can relate to increased mutualism and pro-environmental behavior (Ghasemi & Kyle, 2021). Past research has shown results indicating hunters are opposed to large

carnivore restoration, such as wolf conservation in the western United States, due to the concern that carnivore recovery might lead to a decrease in game species populations (Miller et al., 2013).

1.5 Research Objectives

The primary objectives of this study are to determine how demographic and psychological factors influence Florida residents' preferences for funding private land stewardship and to measure their willingness to pay for different conservation outcomes. Regarding demographic factors, I predict females, those with higher educations, those with higher household incomes, and those with children in their household, are more willing to pay to help finance private land stewardship than their counterparts. I predict members of minority populations are less willing to pay for a conservation program that supports private land stewardship. Additionally, I predict individuals who participate more frequently in outdoor recreational activities prefer to fund a conservation program rather than not have a program in place.

For the psychological factors, I predict individuals with mutualistic beliefs and positive attitudes towards wildlife and nature are more likely to prefer a conservation program in place and help fund private land stewardship. Additionally, individuals with high risk perceptions of the Florida panther, pertaining to the panther's potential threats towards pets, people, and livestock, are less likely to prefer a program that supports the recovery of the species, while people who support panther conservation prefer the species to be recovered. I predict individuals with high risk perceptions regarding an increased probability of flooding on their property are more likely to prefer a program that offers flood risk reduction. Similarly, I predict the hunters

and angler population is less willing to support a program that supports the recovery of the Florida panther and more strongly prefer a program that offers a high population level of game species compared to the public population. I predict people with high risk perceptions of an increased probability of floods are more likely to prefer a program focusing on flood risk reduction rather than no reduction in flood risk. Finally, I predict that the incorporation of climate change language will cause respondents to answer differently to the survey questions compared to individuals that received the survey without climate change language.

Chapter 2: Methodology

To attain my objectives, this research utilized a survey to investigate Florida public residents', hunters', and anglers' willingness to pay for private land stewardship practices to conserve native habitat and its ecosystem services. I focused on respondents' attitudes towards native and game species, perceptions of flood risk, the Florida panther, and climate change, and demographics.

The survey provided knowledge to the respondents on the current private land stewardship practices and stewardship's connection to native habitats and species in Florida. The Florida panther was introduced into the survey to assess people's perceptions of the species and their preference of the Florida panther's population status. Additionally, respondents were given information of what the Endangered Species Act (ESA) states is needed to down list the panther from endangered to threatened to recovered so the respondents might better understand the requirements for panther populations and hypothetical bias can be minimized in the respondents' answers to the survey questions. Topics included questions surrounding the respondent's liking of common native species, their preferences for population levels of certain wildlife species, and their concerns regarding a change in native habitat or wildlife populations to measure respondents' attitudes on those subjects.

I introduced outdoor recreational activities potentially allowed on private lands to demonstrate the respondent has opportunities to utilize the land. To understand the value Florida residents placed on outdoor recreation, respondents were asked how often they engaged in the following recreational activities: hiking, hunting, and fishing. I added a section in the survey on

flood protection as an additional ecosystem service that could benefit Florida residents. I included questions regarding flood insurance and their concern with flooding on their property to measure their risk perceptions of an increased probability of flooding.

To fund private land stewardship, I introduced an annual fee, specifically $1, $4, $8, or $12, which Florida residents would pay when registering their vehicles. The fee would be in addition to the amount the vehicle owner currently pays to register a car for a standard Florida license plate.

I incorporated language and ideas surrounding climate change to assess if the mention of climate change created any rejection bias for funding private land stewardship. To analyze if the mention of climate change caused people to turn away from conservation, I created two identical versions of the survey, however, one version did not mention climate change (Survey A), and the other included language about climate change in the context of the questions from Survey A (Survey B). Survey B included questions regarding the respondent's concern about how climate change affects native habitats, the Florida panther, and flood risk. The two versions of the survey were randomly distributed to respondents. For the public population, approximately 50.8% of respondents received Survey A, and 49.2% of respondents received Survey B. For the hunters and anglers population, approximately 49.3% of respondents received Survey A, and 50.7% of respondents received Survey B.

2.1 Survey Design

The framework for the survey, demonstrating Florida residents' preferences for funding private land stewardship and measuring their willingness to pay for program attributes, was modeled after the study developed by Pienaar et. al (2019). I designed a stated preference choice

experiment (SPCE) to determine the value Florida public residents, hunters, and anglers placed on the following attributes: Florida panther population level, game species level, recreational activities offered, and flood protection. Additionally, an annual fee, ranging from $1 to $12, was included as an attribute for each of the options in the form of an additional registration fee for a standard Florida license plate. Using SAS software, I was able to maximize D-efficiency to minimize the overall variance of the predicted regression coefficients. The program produced a design with four choice blocks, each block containing 4 sets (referred to as 'choice cards') with options to choose from three different programs that varied by different levels of the attributes mentioned previously. The D-efficiency of the design was 99.5684.

To minimize accidental and selective bias for distributing the choice cards to respondents and create a representative sample, the respondents were randomly shown one block of four choice cards where they were asked to choose which option they preferred (Figure 2.1). Each of the options included various levels of the attributes and the annual fee they would be expected to pay per vehicle registered in their name (Table 2.1). Respondents were also allowed to not choose any of the options shown on the choice card and were told they would not be helping to finance land stewardship on private lands, and the land may be converted to urban development.

To reinforce the total annual amount the respondent would pay and minimize hypothetical bias, a table was shown after the first choice card question with various total payment amounts they would pay based on the number of cars they had and which payment option they had chosen (Figure 2.2). The respondent had the option to go back to the original question and change their answer if the respondent wished to do so. After choosing their preferred options for the four choice cards, the respondents were asked how confident they were that their choices reflected how they would vote if they were asked to vote on the issue on a scale

from 0 (not at all confident) to 10 (extremely confident). Understanding how confident respondents were in their answers gives insight into how accurate their choices would be if they were to actually vote on a conservation program. This can be useful for developing management strategies. However, if the respondent chose not to select any of the options from the set of four questions, they were asked why they would not help finance land stewardship on private lands. This helped inform me whether the respondent rejected the programs due to other underlying reasons not pertaining to the attributes in the choice experiments. For example, people may not prefer to finance private land stewardship because they believe it is not their responsibility, they should not have to pay more taxes, or they do not trust the landowners to maintain natural habitats for wildlife. Understanding these factors that turn people away from conservation programs can help in developing management strategies.

Figure 2.1: *Example of a choice card within the survey where the respondent is asked to select their preferred option.*

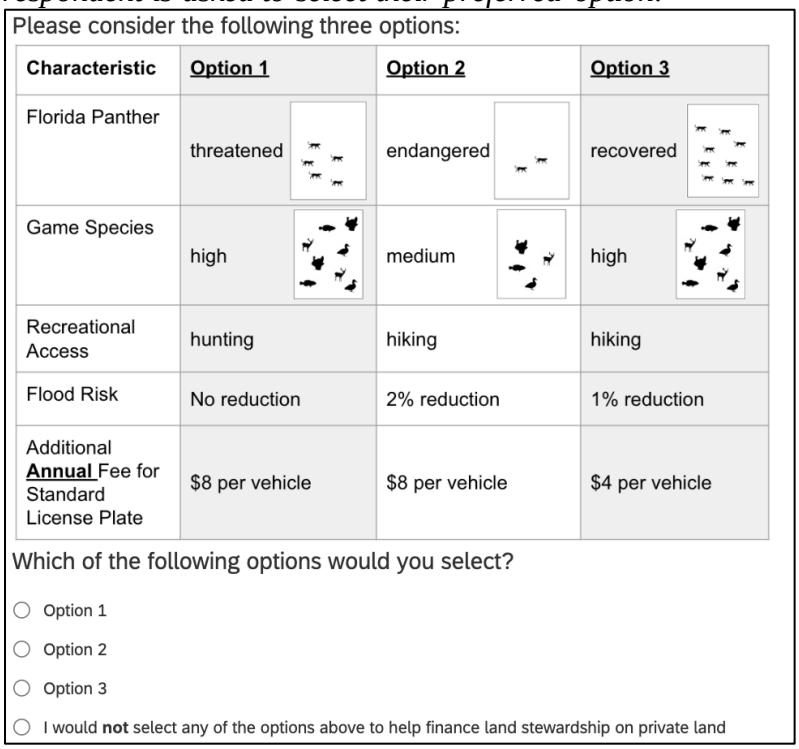
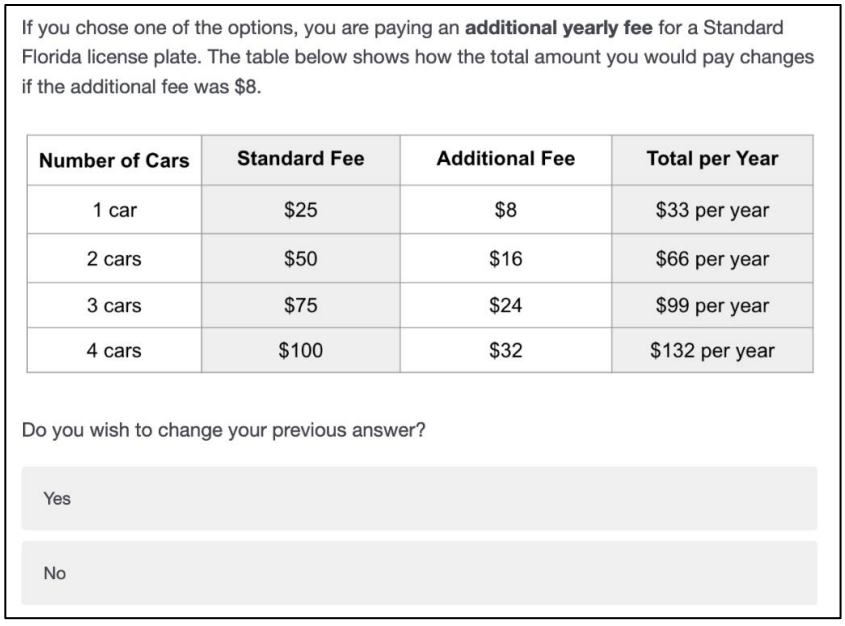


Table 2.1: *Stated preference choice experiment's attributes and their levels*

Attribute	**Attribute Levels**
Florida panther population	Endangered Threatened Recovered
Game species population	Low Medium High
Outdoor recreational activity	Hiking Hunting Fishing
Flood risk reduction	No reduction 1% reduction 2% reduction
Additional annual fee for standard license plate	$1 per vehicle $4 per vehicle $8 per vehicle $12 per vehicle

Figure 2.2: *Table shown after choice card 1 to reinforce total payment amount based on number of vehicles respondent had registered and which program was chosen*



If you chose one of the options, you are paying an **additional yearly fee** for a Standard Florida license plate. The table below shows how the total amount you would pay changes if the additional fee was $8.

Number of Cars	Standard Fee	Additional Fee	Total per Year
1 car	$25	$8	$33 per year
2 cars	$50	$16	$66 per year
3 cars	$75	$24	$99 per year
4 cars	$100	$32	$132 per year

Do you wish to change your previous answer?

Yes

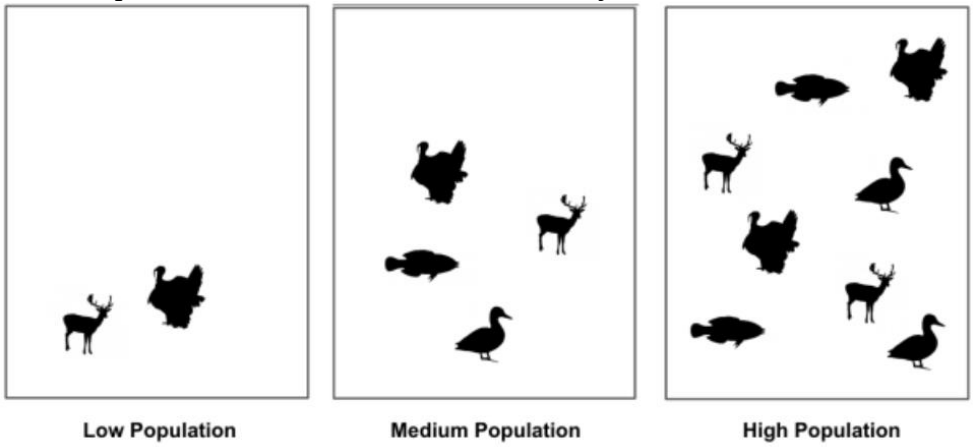
No

To ensure the respondents accurately understood the attributes in the choice experiment, explanations of the options were provided along with an example of how they would answer the questions. The survey stated that if the respondent chose not to select one of the options in the choice card, they were choosing not to help finance land stewardship on private land, and the land may be converted to urban development. The respondents were informed that hunting and fishing rights were not guaranteed if there was an increased abundance of wildlife and fish species on private lands. Additionally, the survey stated that private landowners may choose to allow certain recreational activities on the landowner's land.

The Florida panther population level for "endangered" was described as the current state of the species, where there is a single breeding population of 240 adults and the species is at risk of becoming extinct in the wild. The "threatened" level was described as two breeding populations of at least 240 adults each in Florida, and the "recovered" level meant there was at three breeding populations of at least 240 adults in the Southeastern US. The survey stated that conservation of habitat on private lands is critical to conservation and protecting the panther. Respondents were also shown a map of where the panther would be located based on their population status (Figure 2.3). Additionally, the survey stated that more private land managed for game and fish species would increase game and fish populations, and respondents were shown a figure explaining the different game species population levels: low, medium, and high (Figure 2.4).

Figure 2.3: *Possible Florida panther locations based on their population status as described in the survey*

Figure 2.4: *Game species levels as described in the survey*



I described flood reduction as where "no reduction" meant the probability that properties in a floodplain will flood at least once every 30 years remains at 26%; a "1% reduction" meant that the risk of flooding falls to 25%; and a "2% reduction" meant that the risk of flooding falls to 24%. The survey stated that the payment amount was a yearly additional fee that applied to each Florida-registered vehicle in the respondent's name.

Prior to launching the survey, I performed pretests of the survey on experts who had advanced knowledge and experience conducting surveys in similar research. I also had several members of the public that lived in and near Florida, all varying in age, gender, and income levels, to test the survey. There were approximately 20 people, with 7 of those being experts, which pretested the survey prior to launch. I recorded the average time to complete the survey,

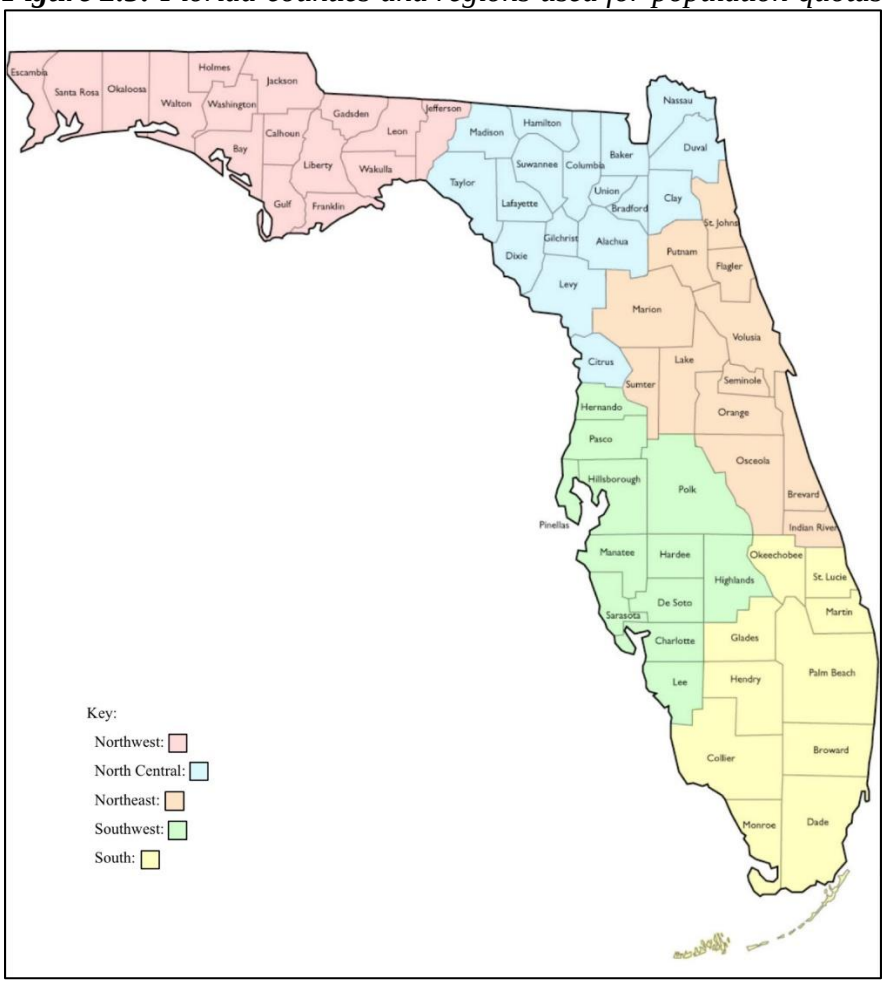
approximately 10 to 15 minutes, as well as the average time it took to answer each of the choice cards (ranging from 12 to 45 seconds). I also considered the feedback from these respondents to make any necessary changes before launching the finalized version so I could provide the respondents with a clear and accurate survey and gain useful data for my analysis. Feedback included spotting potential bias and leading with the questions, providing alternative species to present in the survey, rephrasing sentences, and clarifying questions that were unclear.

2.2 Contact Information Collection

The survey was distributed to Florida residents, and the responses were collected online through Qualtrics. Qualtrics Research Services collected responses from members of the public and recruited a representative sample of Florida residents based on the U.S. Census data for the following regions of Florida: 6.95% from Northwest, 9.57% from Northcentral, 23.03% from Northeast, 27.13% from Southwest, and 24.29% from South (Figure 2.5). Qualtrics Research Services was also asked to fulfill the following 'soft' demographic quotas to allow for flexibility:

1. Age: 7.3% aged 18-24, 16.2% aged 25-34, 16% aged 35-44, 16% aged 45-54, 17.4% aged 55-64, 27.1% aged 65 and over
2. Gender: 51% female and 49% male
3. Education: 30.8% with less than a high school degree, 32.2% with an Associate's degree, 22.9% with Bachelor's degree, and 14% with a Graduate or professional degree
4. Household gross income: 18.4% for less than $25,000, 22.4% for $25,000 to $49,999, 31% for $50,000 to $99,999, 28.3% for $100,000 or more

Figure 2.5: *Florida counties and regions used for population quotas*



I collected contact information for Florida hunters and anglers by requesting access to the public records of hunting and fishing licenses registered in Florida provided by the Florida Fish and Wildlife Conservation Commission (FWC). I downloaded the contact information data and obtained the email addresses of recreational license holders for hunting and freshwater fishing. I confirmed all participants were at least 18 years of age and were currently living in Florida before randomly selecting the sample. I stratified the sample by race, gender, and age and randomly selected email addresses within those groups. When stratifying the sample, I used the

following percentages for each demographic: 1% for Asian, 2% for Black or African American, 6% for Hispanic or Latino, 0.08% for Native American, 89.92% for White, and 1% for other. I used the U.S. Census Data to obtain accurate percentages of gender and age within each race demographic. I also reviewed the types of hunting and fishing licenses to ensure there was a mix of different kinds of hunters and anglers. It was a challenge to stratify the hunters and anglers by region since not all of the license holders displayed their county of residence. However, the respondents filled out their zip code and county in the survey, so I was able to discover the demographic characteristics of the sample by checking their responses and to confirm the zip code matched the corresponding county.

2.3 Survey Distribution

I sent an email to the hunters and anglers asking them to participate in my survey, with the survey's link attached. Additionally, the email consisted of a short description of the survey, and why their opinions are important to providing information regarding conservation programs in Florida. After the initial email, I sent nonrespondents four reminder emails at weekly intervals. There was no additional contact after the four reminders. I sent the email to approximately 19,753 email addresses and received a total of 880 completed responses. Before filtering the responses based on if the respondent correctly matched their zip code to their county, if they straight lined the Likert scale questions, and if they sped through the SPCE questions, there was an 81% completion rate and a 6% response rate given by Qualtrics. After filtering the responses, I totaled approximately 672 responses. Additionally, I removed respondents who did not have any vehicles registered in their name, since it would make the SPCE a hypothetical situation for the respondent and might provide biased results. Therefore, the survey totaled approximately 646

responses from the hunters and anglers population. The data collection period for the hunters and anglers population began on February 27, 2023 and concluded May 2, 2023 to allow respondents ample time to finish unanswered questions to the survey.

Qualtrics Research Services provided payment to the respondents they recruited to incentivize their participation. However, the hunters and anglers I directly emailed were not paid. Qualtrics Research Services collected approximately 1,033 responses. After removing respondents who did not have a registered vehicle, I totaled 874 responses for the public population. The data collection period for the public population began on March 6, 2023 and concluded on March 30, 2023.

2.4 Testing of the Climate Change Language

Since there were two versions of the survey that were randomly distributed to respondents, one that did not mention climate change (Survey A) and one that included language about climate change (Survey B), I tested responses, specifically responses to private landowners receiving payment for stewardship, conservation and loss of native and game species' habitats, and risk of flooding, to see if the mention of climate change caused respondents to answer differently than if they received Survey A with no language of climate change. I combined the variables for the identical question from each survey version and ran the appropriate tests. I used a paired t-tests for continuous variables, given by:

$$t = \frac{\overline{X}_{diff}}{(S_{diff} \div \sqrt{n})}$$

Where $\overline{X}_{diff}$ is the sample mean of differences, S_{diff} is the sample standard deviation of the differences, and n is the sample size, and t has a t distribution with n-1 degrees of freedom. I used a Kruskal-Wallis test for ordinal level independent variables, given by:

$$H = \frac{12}{N(N+1)} \sum_{i=1}^{k} \frac{R_i^2}{n_i} - 3(N+1)$$

Where k is the number of groups used for comparison, N is the total size of the sample, n_i is *i*-th groups sample size, and R_i is the total ranks related to the *i*-th group, and H has a chi-square distribution with k-1 degrees of freedom.

2.5 Measuring Latent Constructs

Since latent constructs, such as people's attitudes and beliefs, cannot be observed directly, I used principal factor analysis in STATA 17.0 BE – Basic Edition to discover patterns in the responses that overlap and describe variability among observed, correlated variables. I also used principal factor analysis to predict and create variables for questions in the survey that were designed to measure the same construct in order to condense the data into fewer variables. I incorporated a condensed version of the wildlife value orientation scale consisting of fourteen statements used in the study by Chase et al., (2015) at the end of the survey to measure respondents' wildlife value orientations. Some of the statements included were "humans should manage wild animal populations so that humans benefit", "animals should have rights similar to the rights of humans", and "hunting is cruel and inhuman to animals" (Table 2.2 & 2.3). I used principal factor analysis to also capture people's attitudes, beliefs, and risk perceptions from their responses to questions such as: "How much do you like or dislike the following game species?", "How concerned are you about loss of habitat for native species?", "How concerned are you

about flooding on your property?", and "How important is the conservation of the Florida panther to you?".

During the factor analysis, I used an eigenvalue of at least 1 to determine and retain the number of principal components. To achieve a more interpretable structure, I rotated the factor matrix. A factor loading greater than |0.3| was used as the loading cutoff, determining which variables belong to which factor. I used Cronbach's alpha to measure the internal consistency of a set of survey items and determine if a collection of items consistently measures the same characteristic. I used a total alpha level of 0.7 or higher to indicate response values were consistent and the factors measured unidimensional constructs. If the individual alphas for each of the variables were less than or equal to the total alpha and if removal of any of the variables caused the total alpha to decrease below the critical level of 0.7, I would factor analyze the variables and predict a new variable that measures a unidimensional construct.

2.6 Analysis of the SPCE Questions

In reality, it is rare that there is homogeneity of preferences across individuals. To capture possible preference heterogeneity within the sample, I used the random parameters logit (RPL) model to analyze the SPCE data. In the RPL model, the vector of random parameters has a mean and variance. The mean coefficients represent the average change in the log odds of the response variable associated with a 1 unit increase in the predictor variable, and the standard deviation coefficient captures preference heterogeneity that may be present. We used STATA 17.0 BE - Basic Edition to estimate all models.

The basic RPL model was developed by including the attribute levels (Florida panther population, game species population, outdoor recreation activities, change in flood risk, and

additional annual fee for a standard license plate). The utility function that respondent i derives from each option in the choice experiment j is defined as the sum of a systematic, known component (V) and a random component (u):

$$U_{ij} = V_{ij} + u_{ij}$$

Often, a linear function is assumed, such that

$$V_{ij} = \sum_{k} X'_{ij}\beta$$

where X_{ij} is a vector of the attribute levels, and β is the vector of attribute coefficients (Pienaar et al., 2019).

I used binary coding to enter Florida panther population, game species population, outdoor recreation activities, and change in flood risk into the model. For the Florida panther, I coded the ESA status of the panther such that I captured the species being listed as threatened or listed as recovered. I omitted the panther being listed as endangered to avoid multi collinearity in the model and chose endangered as the base level since choosing to opt-out of any of the options presented meant the species remained endangered. Similarly, I binary coded the population levels of game species to capture if the level was medium or high and omitted low. Additionally, I binary coded flood risk reduction to capture either a 1% reduction or 2% reduction, while no reduction in flood risk was set as the base level for the change in flood risk. I multiplied the additional annual fee, which was continuously coded, by the amount of vehicles registered in the respondent's name to include the total bid amount in the model that the respondent accepted in the program they chose. I wanted to capture if the public responded differently to the survey compared to the hunters and anglers, so I created separate RPL models for each population. Therefore, I binary coded recreational activities to capture hiking and hunting and set fishing as the base level for the public population RPL model, since there were respondents in this sample

who neither hunted nor fished. Descriptions of the variables in each model can be found in Table 2.14. The basic RPL model for the public is given by:

$$V_{ij} = X'_{ij}\beta = \beta_0 + \beta_1 \cdot Threatened_{ij} + \beta_2 \cdot Recovered_{ij} + \beta_3 \cdot Medium\ game_{ij} + \beta_4 \cdot High\ game_{ij} + \beta_5 \cdot Hunting_{ij} + \beta_6 \cdot Hiking_{ij} + \beta_7 \cdot Flood\ reduction_{ij}^{1\%} + \beta_8 \cdot Flood\ reduction_{ij}^{2\%} + \beta_9 \cdot Annual\ fee_{ij} + u_{ij}$$

Alternatively, for the hunter and anglers RPL model, recreational access was binary coded to capture hunting or fishing while hiking was set as the base level in order to capture the hunters and anglers' value on fishing as well as hunting. The basic RPL model for the hunters and anglers is given by:

$$V_{ij} = X'_{ij}\beta = \beta_0 + \beta_1 \cdot Threatened_{ij} + \beta_2 \cdot Recovered_{ij} + \beta_3 \cdot Medium\ game_{ij} + \beta_4 \cdot High\ game_{ij} + \beta_5 \cdot Hunting_{ij} + \beta_6 \cdot Fishing_{ij} + \beta_7 \cdot Flood\ reduction_{ij}^{1\%} + \beta_8 \cdot Flood\ reduction_{ij}^{2\%} + \beta_9 \cdot Annual\ fee_{ij} + u_{ij}$$

Both variations of the models were run for the public and the hunters and anglers, however we chose to set the base level as fishing for the public and hiking for the hunters and anglers. Model fit, assessed by Akaike's information criterion (AIC), decreased if fishing was included instead of hiking in the public RPL model, and the AIC also decreased if hiking was included rather than fishing in the hunters and anglers RPL model. The opt-out variable should be interpreted as the alternative specific constant (ASC), as it captures all other factors not in the choice experiment that could be influencing the respondent's decision.

Due to the assumption that all variables in the model are exogenous, we included demographic variables that interacted with certain attributes of the SPCE. Demographic variables are considered to be truly exogenous since they are not correlated with the error term. For both the public population and the hunters and anglers population, we added demographic variables

into the RPL model to provide insight on how demographic characteristics may influence behavior for choosing to opt out or pay for a conservation program. The following demographic variables were binary coded to capture what the respondent identified as: gender (male=0, female=1), race and ethnicity (Hispanic, American Indian or Alaska Native, Asian, Black or African American, and Native Hawaiian or other Pacific Islander), if there were children in the household, if the respondent had pets, and if they were a hunter or angler. The remaining demographic variables were continuously coded: income (25, 37.5, 75, 150, or 200 measured in thousands of dollars), age (21, 29.5, 39.5, 49.5, 59.5, 69.5, or 70 measured in years), education (10, 12, 14, 16, or 18 measured in years), and the frequency of recreation activities (0, 3, 8, 16, or 21 measured in times per year). We interacted the following demographics with the opt-out dummy: age, gender, race and/or ethnicity (Hispanic, American Indian or Alaska Native, Asian, Black or African American, and Native Hawaiian or other Pacific Islander), education level, if there were members under the age of 18 in the household, and if the respondent had pets to determine if these demographics groups are more or less likely to fund a conservation program. If the respondent said they were a hunter, the variable was interacted with the hunting attribute to assess if hunters preferred a program with hunting. If the respondent said they were an angler, the variable was interacted with the hiking attribute for the public population model and with the fishing attribute for the hunter and angler population model to understand if anglers preferred a program with hiking or fishing as opposed to hunting. The variable that represented if the respondent had children in the household was interacted with the flood risk reduction to determine if respondents with children preferred a reduction in flood risk rather than no reduction to help mitigate flooding for future generations. Income was also interacted with the 2% flood risk reduction for both populations to assess if people with higher incomes prefer a

high reduction in flood risk. The frequency of the respondents' recreational activity in hunting, fishing, and hiking were interacted with hunting, fishing, and hiking, respectively to understand if respondents who participated more frequently in these activities preferred that activity to be offered in the conservation program. I randomly selected 80% of the data from each population and tested for multicollinearity in the interaction variables so that I knew not to include those in my model (e.g. age and female; education and income; hunting frequency and hunters; fishing frequency and anglers). Then, in a stepwise manner, I removed interaction terms based on which variable had the highest p-value until the minimum Akaike's information criterion (AIC) was reached to evaluate how well the model fits the data it was generated from. The best fit model from AIC explains the greatest amount of variation using the fewest possible independent variables, thus the desire to reach the minimum AIC. Then, I estimated the best fit model using the whole sample for each population and removed variables in a stepwise manner until the minimum AIC was reached.

To further understand what may drive people's decision-making, we created a RPL model that included interactions involving psychological factors. Therefore, by taking into account people's beliefs, values, and attitudes, we derived a model explaining how psychological factors may impact respondent's behaviors. Some of the variables that represented psychological factors were effects coded. I asked respondents how much they liked or dislike (strongly dislike = -2, dislike = -1, neither like nor dislike = 0, like = 1, strongly like = 2) to test if people with positive attitudes towards native species and game species preferred to have a conservation program in place. I interacted the respondents' attitudes towards native species with the opt-out dummy. I interacted people's attitudes towards game species with a high level of game species to capture if people with positive attitudes towards game species preferred a high population level.

To capture if people who agreed (strongly disagree = -2, disagree = -1, neither agree nor disagree = 0, agree = 1, strongly agree = 2) with statements that private landowners should receive payments for maintaining native habitats and wildlife on their land were willing to pay for a program, we interacted respondent's level of agreeance on those statements with the opt-out dummy. By interacting respondent's level of support (strongly oppose = -2, oppose = -1, neither support nor oppose = 0, support = 1, strongly support = 2) for hunting and fishing practices with the hunting attribute, we captured if people who supported hunting and fishing practices were more or less likely to pay for a program that included hunting. The wildlife value orientation statements (strongly disagree = -2, disagree = -1, neither agree nor disagree = 0, agree = 1, strongly agree = 2) in the survey were combined using principal factor analysis and used to generate two constructs: mutualistic beliefs and anti-hunting beliefs. We interacted the anti-hunting belief with the hunting attribute to assess if those who had did not support hunting practices were more or less willing to pay for a program that included hunting. The mutualistic belief was interacted with hiking for the public population and fishing for the hunters and anglers population to assess if those who viewed wildlife as equals were more or less willingness to support a program that offered fishing or hiking rather than hunting. Additionally, the mutualistic belief was interacted with the opt-out dummy to capture if people who place emphasis on equality with nature prefer to pay for a conservation program rather than not help finance private land stewardship. Other psychological factors that measured level of concern and importance were continuously coded. To measure if people with more positive attitudes towards the Florida panther and who believed panther conservation is important are more or less willing to pay towards panther recovery, we used the respondent's level of importance (not at all important = 1, slightly important = 2, moderately important = 3, important = 4, strongly important = 5) of

conserving the panther population and habitat to combine statements to generate a single score based on the factor analysis and interacted it with the Florida panther being recovered. By using people's concern (not at all concerned = 1, slightly concerned = 2, moderately concerned = 3, concerned = 4, strongly concerned = 5) for the Florida panther attacking livestock, pets, humans, and game species to generate a score based on the factor analysis, I interacted it with the option to have the panther recovered. This interaction variable measured if respondents with higher risk perceptions of the Florida panther were more or less likely to pay towards recovery of the Florida panther. Similarly, we interacted the score generated from the factor anaylsis of people's concern (not at all concerned = 1, slightly concerned = 2, moderately concerned = 3, concerned = 4, strongly concerned = 5) for flooding with the 2% flood risk reduction to assess if people with higher risk perceptions regarding flooding preferred a program that offered a higher flood risk reduction. Using the same technique as the derivation of the best fit demographic RPL model, I did not include correlated variables and removed interaction variables in a stepwise manner based on the highest p-vale to reach the minimum AIC.

2.7 Calculating Willingness to Pay

By understanding the monetary value residents placed on the attributes in the SPCE questions, the design of a conservation program can be optimized. I used the parameter estimates from the basic RPL model to obtain the willingness to pay estimates in STATA 17.0 BE – Basic Edition. Since each parameter estimate is not known certainty but has some confidence interval, willingness to pay also had an associated confidence interval (Bliemer and Rose, 2013). The maximum amount the respondents were willing to pay for each of the attributes was calculated using the formula below and a 90% confidence interval, where β^k is the parameter for attribute k

and β^{price} is the cost parameter that reflects the combined negative total price based on the number of vehicles owned by the respondent and the amount they were willing to pay for a particular conservation program:

$$E(WTP^k) = -\frac{E(\beta^k)}{\beta^{price}}$$

Chapter 3: Results

3.1 Descriptive Statistics

There was a decently even distribution between male (50.3%) and female (49.7%) respondents for the public population, and the median age category was 45 to 54 years old (Table 3.1). The majority of respondents were white (85.6%), and the median education level was some college and/or an Associate's or technical degree. The public population had a majority of respondents that stated there were no members under 18 years old in their household (68.1%), however, 67.6% of respondents stated they currently had a pet. Although the majority of respondents did not identify as a hunter (88.2%), there was a more even distribution of respondents who stated they fished recreationally (44.9%). The median annual income level before tax for respondents was $50,000 to $99,999. The median category for the frequency for hunting for the public population was never, where fishing and hiking were 1 to 5 times per year. Approximately 19.1% of respondents from the public population claimed they owned a specialty license plate, with 2.1% of respondents having the Protect the Panther license plate. Overall, my final sample of the public population was relatively representative of the Florida population.

Table 3.1. *Demographic characteristics of the public population (N=874), the hunter/angler population (N=646), and the representative percentages for the state of Florida (N=21,538,187).*

	Florida population	Public		Hunter/ Angler	
Demographic	**%**	**Number**	**%**	**Number**	**%**
Gender					
Male	49	440	50.3	562	87
Female	51	434	49.7	84	13
Choose one or more races that you consider yourself to be.					

American Indian or Alaskan Native	0.5	7	0.8	19	2.9
Asian	3	14	1.6	5	0.8
Black or African American	17	88	10.1	17	2.6
Native Hawaiian or Other Pacific Islander	0.1	0	0	1	0.2
White	76.9	748	85.6	574	88.8
Other/I prefer not to say	-	17	1.9	30	4.6
Are you of Hispanic or Latino origin?					
Yes	26.8	127	14.5	43	6.7
No	73.2	747	85.5	603	93.3
Age					
18-24 years	7.3	43	4.9	46	7.1
25-34 years	16.2	133	15.2	81	12.5
35-44 years	16	132	15.1	125	19.3
45-54 years	16	144	16.5	160	24.8
55-64 years	17.4	156	17.8	208	32.2
65 years or over	27.1	266	30.4	26	4
Education Level					
Less than 12th grade	15.4	16	1.8	6	0.9
High school graduate or GED	15.4	206	23.6	95	14.7
Some college/Associate or technical degree	32.2	260	29.7	234	36.2
Bachelor's degree	22.9	243	27.8	189	29.3
Graduate or professional degree	14	149	17	122	18.9
Are there any members in your household under the age of 18?					
Yes	-	279	31.9	240	37.2
No	-	595	68.1	406	62.8
Do you currently have any pets?					
Yes	-	591	67.6	504	78
No	-	283	32.4	142	22
Are you a hunter?					
Yes	-	103	11.8	511	79.1
No	-	771	88.2	135	20.9
Do you fish recreationally?					
Yes	-	392	44.9	625	96.7
No	-	482	55.1	21	3.3
Income Level (before tax)					
Less than $25,000	17.4	126	14.4	39	6
$25,000 to $49,999	18.7	214	24.5	88	13.6

$50,000 to $99,999	28.1	242	27.7	218	33.7
$100,000 to $199,999	24.2	255	29.2	191	29.6
$200,000 or more	11.6	37	4.2	110	17
How often do you, or members of your household, engage in the following outdoor recreational activities?					
Hunting					
Never		672	76.9	118	18.3
1-5 times per year		126	14.4	132	20.4
6-10 times per year		45	5.1	53	8.2
11-20 times per year		21	2.4	83	12.8
21 or more times per year		10	1.1	260	40.2
Fishing					
Never		328	37.5	7	1.1
1-5 times per year		253	28.9	70	10.8
6-10 times per year		136	15.6	91	14.1
11-20 times per year		82	9.4	132	20.4
21 or more times per year		75	8.6	346	53.6
Hiking					
Never		281	32.2	59	9.1
1-5 times per year		307	35.1	168	26
6-10 times per year		129	14.8	136	21.1
11-20 times per year		94	10.8	108	16.7
21 or more times per year		63	7.2	175	27.1
Do you have a specialty license plate?					
Yes		167	19.1	200	31
No		707	80.9	446	69
Do you have a Protect the Panther license plate?					
Yes		18	2.1	8	1.2
No		856	97.9	638	98.8
Do you pay flood insurance?					
Yes		261	29.9	207	32
No		613	70.1	439	68

For the hunter and angler population, the majority of respondents were male (87%), and the median age category was 45 to 54 years old (Table 3.1). The majority of respondents were white (88.8%), and the median education level was some college and/or an Associate's or technical degree. The majority of respondents stated there were no members under the age of 18

years old in their household (62.8%), and 78% of respondents stated they currently had a pet. The majority of the hunter and angler population identified as a hunter (79.1%), and 96.7% identified as someone who fishes recreationally. The median annual income level before tax for the hunter and angler population was $50,000 to $99,999. The median category for hunting for the hunter and angler population was 11 to 20 times per year, fishing was 21 or more times per year, and hiking was 6 to 10 times per year. Approximately 31% of respondents from the hunter and angler population stated they had a specialty license plate, with 1.2% of respondents having a Protect the Panther license plate. For the hunter and angler population, I slightly under sampled people with lower level of education and household income relative to the Florida's population statistics. Additionally, I oversampled respondents who identify as White and under sampled those that identify as Black or African American and Hispanic.

For the SPCE questions, 2.06% of the public population chose to opt-out of choosing a program, while 6.5% of the hunter and angler population chose to opt-out of all programs offered. After answering the four SPCE questions, the respondent reported how confident they were for how accurately their choice reflected how they would vote tomorrow. For the public population, 80.32% answered at least a 7 on a 1 (not at all confident) through 10 (extremely confident) scale, and 87.31% of the hunter and angler population answered at least a 7. The main reasons for the respondents that chose to opt out from the public population was "I should not have to pay more taxes" and "It is not my responsibility". Alternatively, the respondents from the hunter and angler population that chose to opt out from all programs stated their reasons as "It is not my responsibility", "I do not trust private landowners to maintain natural habitats for wildlife", and "I should not have to pay more taxes".

3.2 Effects of Using Climate Change Language

The outcomes of merging variables for the same question from both survey versions, one including climate change language and the other excluding it, and examining whether the inclusion of the climate change language influenced individuals' responses did not yield significant results. The p-value of the tests used, paired t-tests and Kruskal-Wallis tests, were not statistically significant. Thus, I did not have sufficient evidence to say there was a statistically significant difference in the answers between Survey A and Survey B and concluded the use of climate change language did not affect respondents' answers.

3.3 Interpreting Latent Constructs

By using principal factor analysis, I was able to measure latent constructs, such as people's attitudes and beliefs. After factor analyzing the responses to the fourteen statements from the wildlife value orientation scale, there were two factors that had an eigenvalue greater than 1, meaning there were two underlying constructs that the statements were measuring (Figure 3.1). To achieve a more interpretable structure, I rotated the factor matrix.

Figure 3.1*: Eigenvalues greater than 1 for Factor 1 and 2 for public population (N=874)*

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	4.54385	3.04871	0.7201	0.7201
Factor2	1.49515	0.67922	0.2370	0.9571
Factor3	0.81593	0.54403	0.1293	1.0864
Factor4	0.27190	0.11102	0.0431	1.1295
Factor5	0.16088	0.08276	0.0255	1.1550
Factor6	0.07812	0.12626	0.0124	1.1674
Factor7	-0.04815	0.01956	-0.0076	1.1597
Factor8	-0.06770	0.01955	-0.0107	1.1490
Factor9	-0.08725	0.03855	-0.0138	1.1352
Factor10	-0.12579	0.02144	-0.0199	1.1152
Factor11	-0.14724	0.01032	-0.0233	1.0919
Factor12	-0.15756	0.03348	-0.0250	1.0669
Factor13	-0.19105	0.04024	-0.0303	1.0367
Factor14	-0.23129	.	-0.0367	1.0000

LR test: independent vs. saturated: chi2(91) = 8.2e+04 Prob>chi2 = 0.0000

By assessing the factor loadings for the variables on each factor, I separated the variables loading onto Factor 1, with a factor loading greater than |0.3|, from the statements loading onto Factor 2 (Figure 3.2). If a statement did not load onto either factor, I did not combine it with the other variables. For the public population, the following statements were positively loading onto Factor 1: "I care about animals as much as I do about other people", "Animals should have rights similar to the rights of humans", "Wildlife are my family and I want to protect them", "I feel a strong emotional bond with animals", "We should strive for a world where humans and wildlife and fish can live side by side without fear", "I value the sense of a companionship I receive from animals", and "I view all living things as part of one big family".

***Figure 3.2**: Factor loadings on Factor 1 and 2 for WVO statements for public population (N=874)*

Variable	Factor 1	Factor 2	Uniqueness
Humans should manage wild animal populations so that humans benefit	-0.0390	-0.2483	0.9368
We should strive for a world where there's an abundance of fish and wildlife for hunting and fishing	0.1573	-0.5086	0.7166
I care about animals as much as I do other people	0.6827	0.1246	0.5184
Animals should have rights similar to the rights of humans	0.7013	0.2842	0.4274
Wildlife are like my family and I want to protect them	0.7991	0.1716	0.3320
Hunting is cruel and inhumane to animals	0.2671	0.7579	0.3542
The needs of humans should take priority over fish and wildlife protection	- 0.2863	- 0.1622	0.8917

I feel a strong emotional bond with animals	0.7575	0.1669	0.3984
We should strive for a world where humans and wildlife and fish can live side by side	0.4836	0.1621	0.7398
I value the sense of companionship I receive from animals	0.6983	0.0262	0.5117
Fish and wildlife are on earth primarily for people to use	- 0.2048	- 0.2895	0.8743
Hunting does not respect the lives of animals	0.2799	0.7387	0.3760
I view all living things as part of one big family	0.6739	0.2704	0.4727
People who want to hunt should be provided the opportunity to do so	- 0.1444	- 0.7539	0.4108

I used Cronbach's alpha to measure the internal consistency of a set of survey items and determine if a collection of items consistently measures the same characteristic. I used a total alpha level of 0.7 or higher to indicate response values were consistent. Since the individual alphas for each of the variables were less than or equal to the total alpha, and if I removed any of the variables, the total alpha decreased, I factor analyzed the variables and predicted a new variable that holds the mutualism value orientation reflected in these statements. The following statements were positively loading onto Factor 2: "Hunting is cruel and inhumane to animals" and "Hunting does not respect the lives of animals". The following statements were negatively loading onto Factor 2: "We should strive for a world where there's an abundance of fish and wildlife for hunting and fishing" and "People who want to hunt should be provided the opportunity to do so". The negative factor loadings demonstrate the opposite of what the

statement says. Therefore, these statements are reflecting an anti-hunting belief. Similar to the Factor 1 variables, I used Cronbach's alpha to ensure these statements were measuring the same underlying factor. The total alpha decreased below the critical level of 0.7 if any of the variables were removed, indicating the variables should remain together. I factor analyzed the statements and predicted a new variable that measured anti-hunting beliefs. The following statements did not load onto either factor and were not included in predicting the mutualism or anti-hunting belief: "Humans should manage wild animal populations so that humans benefit", "The needs of humans should take priority over fish and wildlife protection", and "Fish and wildlife are on earth primarily for people to use".

For the hunter and angler population, there were two eigenvalues greater than one on two factors (Figure 3.3). The following statements loaded positively on Factor 1: "I care about animals as much as I do about other people", "Animals should have rights similar to the rights of humans", "Wildlife are my family and I want to protect them", "I feel a strong emotional bond with animals", "We should strive for a world where humans and wildlife and fish can live side by side without fear", "I value the sense of a companionship I receive from animals", and "I view all living things as part of one big family" (Figure 3.4). The following statements negatively loaded on Factor 1: "The needs of humans should take priority over fish and wildlife protection" and "Fish and wildlife are on earth primarily for people to use".

***Figure 3.3**: Eigenvalues greater than 1 for Factor 1 and 2 for hunter and angler population (N=646)*

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	3.96232	2.38316	0.7320	0.7320
Factor2	1.57916	1.12459	0.2917	1.0237
Factor3	0.45457	0.15072	0.0840	1.1076
Factor4	0.30385	0.19498	0.0561	1.1638
Factor5	0.10887	0.00501	0.0201	1.1839
Factor6	0.10386	0.12857	0.0192	1.2031
Factor7	-0.02472	0.03555	-0.0046	1.1985
Factor8	-0.06027	0.03575	-0.0111	1.1874
Factor9	-0.09601	0.02436	-0.0177	1.1696
Factor10	-0.12038	0.03149	-0.0222	1.1474
Factor11	-0.15187	0.03841	-0.0281	1.1193
Factor12	-0.19028	0.01055	-0.0352	1.0842
Factor13	-0.20083	0.05409	-0.0371	1.0471
Factor14	-0.25492	.	-0.0471	1.0000

LR test: independent vs. saturated: chi2(91) = 4.6e+04 Prob>chi2 = 0.0000

***Figure 3.4**: Factor loadings on Factor 1 and 2 for WVO statements for hunter and angler population (N=646)*

Variable	Factor 1	Factor 2	Uniqueness
Humans should manage wild animal populations so that humans benefit	- 0.1319	- 0.3403	0.8668
We should strive for a world where there's an abundance of fish and wildlife for hunting and fishing	0.1436	- 0.4694	0.7591
I care about animals as much as I do other people	0.6760	- 0.0435	0.5412
Animals should have rights similar to the rights of humans	0.7235	0.2339	0.4218
Wildlife are like my family and I want to protect them	0.7585	0.0970	0.4153
Hunting is cruel and inhumane to animals	0.1831	0.6952	0.4831
The needs of humans should take priority over fish and wildlife protection	- 0.4794	- 0.0650	0.7660
I feel a strong emotional bond with animals	0.6684	0.0709	0.5482
We should strive for a world where humans	0.5948	0.1240	0.6309

and wildlife and fish can live side by side			
I value the sense of companionship I receive from animals	0.5711	0.0508	0.6712
Fish and wildlife are on earth primarily for people to use	- 0.4057	- 0.3100	0.7393
Hunting does not respect the lives of animals	0.1556	0.7073	0.4755
I view all living things as part of one big family	0.6514	0.1378	0.5567
People who want to hunt should be provided the opportunity to do so	- 0.0487	- 0.6436	0.5835

After using Cronbach's alpha to determine these variables reflect the same underlying measure and the maximum alpha was reached, I factor analyzed the variables and predicted a new variable that measured mutualism beliefs. The following statements positively loaded on Factor 2: "Hunting is cruel and inhumane to animals" and "Hunting does not respect the lives of animals". The following statements negatively loaded on Factor 2: "Humans should manage wild animal populations so that humans benefit", "We should strive for a world where there's an abundance of fish and wildlife for hunting and fishing" and "People who want to hunt should be provided the opportunity to do so". After using Cronbach's alpha, the statements "Humans should manage wild animal populations so that humans benefit" and "We should strive for a world where there's an abundance of fish and wildlife for hunting and fishing" had alphas greater than the total alpha. Since removing those variables increased the total alpha, causing it to become greater than the critical level of 0.7, I excluded them from the factor analysis for the

variables loading onto Factor 2. Then, I predicted a new variable that measured anti-hunting beliefs.

To capture respondent's attitudes towards native species and game species, I, separately, factor analyzed and used Cronbach's alpha for statements regarding the scale for if respondents liked or disliked the given native species, Florida scrub jay, common kingsnake, Florida panther, saw palmetto, coyote, and oak toad, and game species, bobwhite quail, white-tailed deer, largemouth bass, wild turkey, mallard duck, and squirrel. I predicted new variables to measure the attitudes of native species and of game species. The median responses for public population and the hunter and angler population showed generally positive attitudes towards both native species and game species, with the hunter and angler population's median response having slightly stronger positive attitudes towards the species. However, the median response for the hunters and anglers was "dislike" towards coyotes, whereas the median response towards coyotes for the public was "neither liked nor disliked" (Table 2.4 & 2.5). I used the same process of factor analyzing and using Cronbach's alpha to predict a variable that reflected attitudes towards Florida panther conservation from the questions concerning the respondent's importance for conserving panther population and its habitat. Both populations had a median response believing it was important to conserve panther habitat and populations (Table 2.6 & 2.7). After factor analyzing and using Cronbach's alpha for the statements regarding respondents' concern about the loss of habitat and native species, I predicted a new variable that measured people's risk perceptions of the panther killing pets, livestock, game species, and humans. Additionally, I predicted a new variable that measured respondents' risk perceptions of an increased flood risk. While the public population's median response was concerned of the panther's threats, the hunter and anglers' median response indicated they were less concerned with the threat of the panther

(Table 2.8 & 2.9). Both populations were slightly concerned about the increased risk of flooding (Table 2.8 & 2.9).

To measure respondents' beliefs on hunting and fishing practices, I factor analyzed and used Cronbach's alpha, with a minimum level of 0.7, for statements pertaining to if they supported or opposed hunting and fishing, as well as if they agreed or disagreed that hunting and fishing were a part of conservation. Although the median response for the public was "neither supported nor opposed" hunting and fishing, the hunter and angler population's median response showed they strongly supported the activities (Table 2.10 & 2.11). Additionally, the hunter and angler population's median response indicated they more strongly agreed that hunting and fishing are part of conservation than the median response for the public population did (Table 2.12 & 2.13). I also measured respondents' beliefs on if private landowners should receive compensation for stewardship activities by factor analyzing and using Cronbach's alpha for statements pertaining to if landowners should receive payments to conserve habitat and wildlife on their land. Both populations had a median response that agreed landowners should receive payments for stewardship (Table 2.12 & 2.13).

3.4 Basic RPL Model

In the basic RPL model for the Florida public, all the mean coefficients, except hiking, were statistically significant at the 5% level (Table 3.2).

Table 3.2: *Basic RPL Model for public population (N=874)*

	Mean		Standard deviation	
	Coeff.	**S.E.**	**Coeff.**	**S.E.**
Opt-out dummy	-2.263***	0.287	4.087 ***	0.277
Total bid	-0.045 ***	0.005	-	-

Threatened Florida panther	0.212 ***	0.074	0.201	0.175
Recovered Florida panther	0.697 ***	0.079	0.957 ***	0.132
Medium game species	0.714 ***	0.070	0.481 ***	0.182
High game species	0.486 ***	0.074	0.940 ***	0.116
Hunting	-0.322 ***	0.074	0.498 ***	0.143
Hiking	0.032	0.066	0.183	0.253
1% reduction	0.351 ***	0.064	0.101	0.112
2% reduction	0.425 ***	0.067	0.741 ***	0.105
Log likelihood	-4023.68			
Observations	13,804			
AIC	8085.36			

** Significant at 5% level
*** Significant at 1% level

The coefficient on the total bid was negative, indicating that for every additional dollar per license plate, respondents were less likely to agree to make a payment. The opt-out dummy had a negative mean coefficient, meaning on average, respondents preferred to have a conservation program in place as opposed to opting out. However, the standard deviation coefficient of the opt-out variable was statistically significant at the 5% level, indicating preference heterogeneity. The magnitude of the standard deviation coefficient showed there was a subset of people who did prefer to opt-out of choosing a conservation program. The mean coefficients for the Florida panther being threatened and recovered were positive, with the magnitude of the recovered variable being slightly higher. On average, people were more likely to pay for a conservation program if the Florida panther was recovered but were still likely to pay if the panther was threatened. There was no preference heterogeneity for the Florida panther being threatened, indicating everyone preferred a program that ensured the panther was downlisted from endangered to threatened. However, there was preference heterogeneity for the panther being recovered. The magnitude of the standard deviation indicated there were a subset

of people who did not prefer the Florida panther to be recovered. The mean coefficients for the game species population levels were both positive, with the high population level being slightly lower than the medium population level. On average, respondents preferred a program with a medium population level for game species compared to a low level, but were still likely to pay for a program that included a high game species population level. There was preference heterogeneity for both medium and high levels. However, the magnitude of the standard deviation for a medium level demonstrated the respondents valued a program with a medium level of game species, but the strength of their preference differed. In contrast, the magnitude of the standard deviation coefficient for a high level of game species showed there was a subset of people who did not prefer a program with a high game species population level. The negative mean coefficient for hunting indicated that, on average, the respondents did not prefer a program that included hunting as the recreational opportunity compared to those that included hiking or fishing. However, there was preference heterogeneity when looking at the standard deviation parameter, and the magnitude indicated there was a subset of people that did prefer a program with hunting. Neither the mean coefficient nor standard deviation coefficient of the hiking parameter were statistically significant at the 5% level, meaning on average, respondents were indifferent to a program that included hiking. The positive mean coefficients on the 1% and 2% flood risk reduction parameters indicated that on average, respondents preferred a program with a 1% or 2% reduction rather than no reduction. Since the 2% reduction coefficient was higher than the 1% reduction in flood risk, on average, respondents preferred a 2% reduction over a 1% reduction. There was no preference heterogeneity for a 1% flood risk reduction, however, there was for a 2% reduction. The significant p-value and magnitude of the standard deviation

coefficient indicated there was a subset of people who did not prefer a 2% reduction in flood risk.

In the basic RPL model for the hunters and anglers in Florida, all of the mean coefficients, excluding the opt-out dummy and 2% flood risk reduction, were statistically significant at the 5% level (Table 3.3).

Table 3.3: *Basic RPL Model for the hunters and anglers population (N=646)*

	Mean		Standard deviation	
	Coeff.	**S.E.**	**Coeff.**	**S.E.**
Opt-out dummy	-0.327	0.396	5.661 ***	0.439
Total bid	-0.025 ***	0.004	-	-
Threatened Florida panther	0.680 ***	0.101	0.218	0.187
Recovered Florida panther	1.225 ***	0.107	0.904 ***	0.164
Medium game species	1.410 ***	0.108	0.610 ***	0.210
High game species	1.888 ***	0.117	0.957 ***	0.149
Hunting	0.704 ***	0.095	0.963 ***	0.963
Fishing	0.434 ***	0.101	0.419	0.509
1% reduction	0.187 **	0.089	0.242	0.200
2% reduction	0.153	0.091	0.384	0.240
Log likelihood	-2540.37			
Observations	10,220			
AIC	5118.74			

** Significant at 5% level
*** Significant at 1% level

Similar to the basic RPL model for the public population, the coefficient on the total bid was negative, indicating that respondents were less likely to pay for the program for each additional dollar per license plate. Although the opt-out dummy was not statistically significant and on average, respondents were indifferent to opting out, there was preference heterogeneity when looking at the standard deviation coefficient. Therefore, there was a subset of people who

did have a preference for opting out or paying for a conservation program. The mean coefficient for the threatened Florida panther variable was positive, indicating that, on average, people preferred a program where the panther was threatened rather than endangered. The mean coefficient for the recovery of the Florida panther was positive, indicating that, on average, people preferred a program that ensured recovery of the species. On average, respondents preferred a program for the panther to be recovered rather than threatened since the mean coefficient on the recovered variable is higher than the threatened variable. There was no preference heterogeneity for the panther going from endangered to threatened, however, there was preference heterogeneity for the recovery of the panther. The magnitude of the standard deviation coefficient for recovery indicated there was a subset of people prefer the panther to be threatened, although they will still support a program that ensures recovery of the panther. The mean coefficients for the medium and high levels of game species populations were positive, with the coefficient for a high level being larger than a medium level. On average, respondents preferred a program with a high level of game species compared to medium and low levels and preferred a program with a medium level of game species compared to a low level. However, there was preference heterogeneity for both the high and medium levels. The magnitude of the standard deviation coefficients showed respondents still preferred the medium and high levels over the low level, but the strength of their preference differed. The mean coefficients for the hunting and fishing variables were both positive, with some respondents, on average, having a stronger preference for a program that included hunting but still preferring a program that offered fishing rather than hiking. Although there was no preference heterogeneity for a program with fishing, there was for a program that offered hunting. On average, respondents preferred a program that offered hunting, however, the magnitude of the standard deviation coefficient

showed there was a subset of people who did not prefer a program with hunting. Although the 2% flood risk reduction mean coefficient was not statistically significant, the 1% reduction was significant at the 5% level and had a positive coefficient. On average, respondents preferred a program with a 1% flood risk reduction compared to no reduction and were indifferent to a program with 2% reduction. There was no preference heterogeneity for the 2% reduction or 1% reduction, indicating respondents all preferred a 1% reduction over no reduction, and they were indifferent to 2%.

3.5 Demographic Interactions in RPL Model

The best fit demographic RPL model for the public population was given by:

$$V_{ij} = X'_{ij}\beta = \beta_0 + \beta_1 \cdot Threatened_{ij} + \beta_2 \cdot Recovered_{ij} + \beta_3 \cdot Medium\ game_{ij} + \beta_4 \cdot High\ game_{ij} + \beta_5 \cdot Hunting_{ij} + \beta_6 \cdot Hiking_{ij} + \beta_7 \cdot Flood\ reduction_{ij}^{1\%} + \beta_8 \cdot Flood\ reduction_{ij}^{2\%} + \beta_9 \cdot Annual\ fee_{ij} + \beta_{10} \cdot (Female_{ij} \cdot Opt\ out_{ij}) + \beta_{11} \cdot (Hispanic_{ij} \cdot Opt\ out_{ij}) + \beta_{12} \cdot (American\ Indian_{ij} \cdot Opt\ out_{ij}) + \beta_{13} \cdot (Asian_{ij} \cdot Opt\ out_{ij}) + \beta_{14} \cdot (Kids_{ij} \cdot Opt\ out_{ij}) + \beta_{15} \cdot (Hunter_{ij} \cdot Hunting_{ij}) + \beta_{16} \cdot (Income_{ij} \cdot Opt\ out_{ij}) + \beta_{17} \cdot (Hike\ frequency_{ij} \cdot Hiking_{ij}) + u_{ij}$$

The RPL model that included demographic interaction variables for the public population presented a majority of the interaction mean coefficients as significant at the 5% level, excluding the interaction between Hispanics and the opt-out dummy, Asians and the opt-out dummy, and income level and the opt-out dummy (Table 3.4). The mean coefficients for the program attribute levels were significant at the 5% level, excluding hiking.

Table 3.4: *Demographic RPL Model for the public population (N=874)*

	Mean		Standard deviation	
	Coeff.	**S.E.**	**Coeff.**	**S.E.**
Opt-out dummy	-1.53***	0.422	3.983 ***	0.289
Total bid	-0.45***	0.005	-	-
Threatened Florida panther	0.219***	0.075	0.148	0.197
Recovered Florida panther	0.721***	0.082	1.065***	0.12
Medium game species	0.737***	0.072	0.593***	0.149
High game species	0.493***	0.075	0.988***	0.12
Hunting	-0.397***	0.078	0.545 ***	0.125
Hiking	-0.152	0.081	0.113	0.217
1% reduction	0.369***	0.064	0.111	0.114
2% reduction	0.426***	0.068	0.819***	0.106
Optout X Female	0.73**	0.357		
Optout X Hispanic	-0.604	0.529		
Optout X American Indian or Alaska Native	3.22***	1.05		
Optout X Asian	-1.408	1.37		
Optout X Kids in house	-1.995***	0.439		
Hunting X Hunters	0.544***	0.171		
Optout X Income level	-0.003	0.003		
Hiking X Hiking frequency	0.03***	0.008		
Log likelihood	-3988.74			
Observations	13,804			
AIC	8031.47			

** Significant at 5% level
*** Significant at 1% level

The coefficient on the interaction term for if the respondent was female and the opt-out dummy, as well as the interaction between American Indians or Alaska Natives, was positive and significant, indicating American Indians or Alaska Natives preferred to opt-out of choosing a program. Although the female variable interacted with opt-out dummy was positive, in respect to the opt-out base, females do not prefer to opt-out of choosing a program. The negative coefficient on the interaction term between if there were members under 18 years of age in the

house and the opt-out dummy indicated that respondents with children in their house preferred to choose a program. The interactions between if a respondent was a hunter and the hunting attribute as well as if the respondent frequently hiked with the hiking attribute presented positive coefficients. Since the coefficients were positive, respondents who identified as a hunter preferred a program with hunting, and respondents who hiked frequently preferred a program with hiking. Given the magnitude of the coefficient for the interaction between hiking and hiking frequency, compared to the base coefficient, they would need to hike at least 6 time a year to prefer a program with hiking. The mean coefficients and standard deviation coefficients for the program attributes only varied slightly in magnitude but are relatively the same as the basic RPL model.

The demographic RPL model for the hunter and angler population was given by:

$$V_{ij} = X'_{ij}\beta = \beta_0 + \beta_1 \cdot Threatened_{ij} + \beta_2 \cdot Recovered_{ij} + \beta_3 \cdot Medium\ game_{ij} + \beta_4 \cdot High\ game_{ij} + \beta_5 \cdot Hunting_{ij} + \beta_6 \cdot Fishing_{ij} + \beta_7 \cdot Flood\ reduction_{ij}^{1\%} + \beta_8 \cdot Flood\ reduction_{ij}^{2\%} + \beta_9 \cdot Annual\ fee_{ij} + \beta_{10} \cdot (Female_{ij} \cdot Opt\ out_{ij}) + \beta_{11} \cdot (Hispanic_{ij} \cdot Opt\ out_{ij}) + \beta_{12} \cdot (American\ Indian_{ij} \cdot Opt\ out_{ij}) + \beta_{13} \cdot (Asian_{ij} \cdot Opt\ out_{ij}) + \beta_{14} \cdot (Black_{ij} \cdot Opt\ out_{ij}) + \beta_{15} \cdot (Kids_{ij} \cdot Opt\ out_{ij}) + \beta_{16} \cdot (Income_{ij} \cdot Opt\ out_{ij}) + \beta_{17} \cdot (Flood\ reduction_{ij}^{1\%} \cdot Kids_{ij}) + \beta_{18} \cdot (Hunt\ frequency_{ij} \cdot Hunting_{ij}) + \beta_{19} \cdot (Fish\ frequency_{ij} \cdot Fishing_{ij}) + u_{ij}$$

For the RPL model that included demographic interaction variables for the hunter and angler population, the majority of the mean coefficients were significant (Table 3.5). The following interaction variables were not significant at the 5% level: Hispanic interacted with the opt-out dummy; Black or African American interacted with the opt-out dummy; if there were

members under the age of 18 years old in the household interacted with a 2% reduction in flood risk. The interactions between if the respondent was female and the opt-out dummy as well as the interaction between if the respondent was American Indian or Alaska Native and the opt-out dummy were significant at the 5% level.

Table 3.5: *Demographic RPL Model for the hunters and anglers population (N=646)*

	Mean		Standard deviation	
	Coeff.	**S.E.**	**Coeff.**	**S.E.**
Opt-out dummy	1.064**	0.542	6.162 ***	0.517
Total bid	-0.026***	0.004	-	-
Threatened Florida panther	0.685***	0.103	0.275	0.203
Recovered Florida panther	1.269***	0.112	1.03 ***	0.155
Medium game species	1.46***	0.11	0.713 ***	0.182
High game species	1.952***	0.12	1.053 ***	0.147
Hunting	-0.212	0.132	0.688***	0.145
Fishing	-0.381	0.255	0.58***	0.211
1% reduction	0.272**	0.107	0.103	0.192
2% reduction	0.182	0.094	0.437	0.209
Optout X Female	-1.877***	0.699		
Optout X Hispanic	-1.114	0.681		
Optout X American Indian or Alaska Native	-6.497***	1.241		
Optout X Asian	6.677***	1.594		
Optout X Black or African American	1.847	1.263		
Optout X Kids in house	-1.554***	0.545		
Optout X Income level	-0.009**	0.004		
1% flood risk reduction X Kids in house	-0.162	0.153		
Hunting X Hunting frequency	0.085***	0.009		
Fishing X Fishing frequency	0.054***	0.013		
Log likelihood	-2473.94			
Observations	10,220			
AIC	5005.88			

** Significant at 5% level
*** Significant at 1% level

The mean coefficients were negative, indicating that females and American Indians or Alaska Natives were less likely to choose the opt-out option and preferred to pay for a conservation program. The interaction between if the respondent was Asian and the opt-out dummy was significant, and the positive coefficient indicated, on average, Asian respondents preferred to opt-out of choosing a conservation program. The negative coefficient on the interaction variable coefficient for if there were members under 18 years of age in the household and the opt-out dummy showed respondents preferred not to opt-out of a program. The negative coefficient on the interaction term between income level and the opt-out dummy indicated respondents with higher incomes, specifically, on average, those with incomes greater than $118,000 per year, preferred not to opt-out of choosing a program. The interaction between if the respondent stated they frequently hunted and the hunting attribute, as well as the interaction between if the respondent fished frequently and the fishing attribute, had a positive coefficient, showing respondents that hunted at least 3 times a year or fished at least 7 times a year preferred a program with hunting or fishing, respectively.

The program attributes' mean coefficients and standard coefficients remain relatively the same as the basic RPL model for the hunter and angler population. However, the opt-out dummy's mean coefficient is now significant at the 5% level, as is its standard deviation coefficient, meaning on average, respondents preferred to opt-out of choosing to pay for a program in place, but there was a subset of people who did not prefer to opt-out. Additionally, the demographic RPL model shows the mean coefficients on hunting and fishing are not significant at the 5% level, but their standard deviation coefficients are significant. Therefore, on average, respondents were indifferent to hunting and fishing as an attribute in the program,

however, there was a subset of people who did prefer hunting in the program and a subset who did prefer fishing in the program.

3.6 Psychological Interactions in RPL Model

The best fit psychological RPL model for the public population was given by:

$$V_{ij} = X'_{ij}\beta = \beta_0 + \beta_1 \cdot Threatened_{ij} + \beta_2 \cdot Recovered_{ij} + \beta_3 \cdot Medium\ game_{ij} + \beta_4 \cdot High\ game_{ij} + \beta_5 \cdot Hunting_{ij} + \beta_6 \cdot Hiking_{ij} + \beta_7 \cdot Flood\ reduction_{ij}^{1\%} + \beta_8 \cdot Flood\ reduction_{ij}^{2\%} + \beta_9 \cdot Annual\ fee_{ij} + \beta_{10} \cdot (Attidudes_{ij}^{Native} \cdot Opt\ out_{ij}) + \beta_{11} \cdot (Attidudes_{ij}^{Game} \cdot High\ game_{ij}) + \beta_{12} \cdot (Mutualism_{ij} \cdot Hiking_{ij}) + \beta_{13} \cdot (Mutualism_{ij} \cdot Opt\ out_{ij}) + \beta_{14} \cdot (Risk\ perception_{ij}^{Panther} \cdot Recovered_{ij}) + \beta_{15} \cdot (Pro\ panther_{ij} \cdot Recovered_{ij}) + \beta_{16} \cdot (Payment_{ij} \cdot Opt\ out_{ij}) + \beta_{17} \cdot (Pro\ hunting_{ij} \cdot Hunting_{ij}) + u_{ij}$$

The RPL model that included psychological interaction terms for the public population produced significant estimates for all of the interaction variables at the 5% level (Table 3.6).

Table 3.6: *Psychological RPL Model for the public population (N=874)*

	Mean		Standard deviation	
	Coeff.	**S.E.**	**Coeff.**	**S.E.**
Opt-out dummy	-2.197***	0.267	3.61 ***	0.259
Total bid	-0.045***	0.005	-	-
Threatened Florida panther	0.205***	0.076	0.287	0.17
Recovered Florida panther	0.68***	0.081	0.978***	0.129
Medium game species	0.726***	0.071	0.497***	0.17
High game species	0.471***	0.075	0.954***	0.114
Hunting	-0.334***	0.074	0.441 ***	0.153
Hiking	0.009	0.66	0.081	0.27
1% reduction	0.361***	0.064	0.14	0.112
2% reduction	0.417***	0.068	0.848***	0.107

Optout X Attitudes towards native species	-0.791***		0.197
High game X Attitudes towards game species	0.315***		0.076
Hiking X Mutualism belief	0.154***		0.058
Optout X Mutualism	-0.657***		0.197
Recovered X Risk perception of Florida panther	-0.251***		0.077
Recovered X Pro-panther conservation	0.337***		0.079
Optout X Belief landowners should be paid	-1.122***		0.219
Hunting X Supportive of hunting and fishing	0.218***		0.062
Log likelihood		-3928.63	
Observations		13,804	
AIC		7911.26	

** Significant at 5% level
*** Significant at 1% level

The coefficient for the variable explaining people's attitudes towards native species was negative, indicating people with positive attitudes towards native species preferred not to opt out and preferred to pay for a conservation program. The positive coefficient on the variable representing people's attitudes towards game species showed that people with positive attitudes towards game species preferred a program that offered a high level of game species. The interaction between the mutualistic belief and hiking had a positive coefficient, indicating people with mutualist beliefs preferred a program with hiking. The interaction between the mutualistic belief and the opt-out produced a negative coefficient, showing that people who have mutualist beliefs preferred to pay for a program and not opt-out. The negative coefficient on the interaction variable representing people's risk perceptions, concerning its threat towards pets, people, and livestock, of the Florida panther indicated that people with strong risk perceptions of the panther,

specifically those moderately concerned that the panther would potentially harm pets, people, and livestock, did not prefer a program where the panther was recovered. Alternatively, the coefficient was positive for the variable explaining how important respondents believed it was to conserve panther populations and habitat, meaning people who placed strong importance on conserving panther populations and habitat preferred a program where the panther was recovered. Since the coefficient was negative for the interaction between agreeing to pay landowners for stewardship and the opt-out dummy, respondents who believed landowners should be paid for maintaining native habitat and wildlife on their land preferred to pay for a conservation program and not opt-out. The coefficient was positive for the interaction between supporting hunting and fishing practices and the hunting attribute, indicating respondents who strongly supported hunting and fishing preferred a program that offered hunting.

The best fit psychological RPL model for the hunters and anglers population was given by:

$$V_{ij} = X'_{ij}\beta = \beta_0 + \beta_1 \cdot Threatened_{ij} + \beta_2 \cdot Recovered_{ij} + \beta_3 \cdot Medium\ game_{ij} + \beta_4 \cdot High\ game_{ij} + \beta_5 \cdot Hunting_{ij} + \beta_6 \cdot Fishing_{ij} + \beta_7 \cdot Flood\ reduction_{ij}^{1\%} + \beta_8 \cdot Flood\ reduction_{ij}^{2\%} + \beta_9 \cdot Annual\ fee_{ij} + \beta_{10} \cdot (Attidudes_{ij}^{Native} \cdot Opt\ out_{ij}) + \beta_{11} \cdot (Attidudes_{ij}^{Game} \cdot High\ game_{ij}) + \beta_{12} \cdot (Risk\ perception_{ij}^{Flood} \cdot Flood\ reduction_{ij}^{2\%}) + \beta_{13} \cdot (Mutualism_{ij} \cdot Opt\ out_{ij}) + \beta_{14} \cdot (Risk\ perception_{ij}^{Panther} \cdot Recovered_{ij}) + \beta_{15} \cdot (Pro\ panther_{ij} \cdot Recovered_{ij}) + \beta_{16} \cdot (Payment_{ij} \cdot Opt\ out_{ij}) + \beta_{17} \cdot (Anti\ hunting_{ij} \cdot Hunting_{ij}) + u_{ij}$$

The RPL model that included psychological interaction terms for the hunters and anglers population produced significant estimates for the majority of the interaction variables at the 5%

level (Table 3.7). The following interactions were not significant: the interaction between attitudes towards native species and the opt-out dummy; the interaction between flood concern and a 2% flood risk reduction; the interaction between risk perceptions of the Florida panther and the panther being recovered.

Table 3.7: *Psychological RPL Model for the hunters and anglers population (N=646)*

	Mean		Standard deviation	
	Coeff.	**S.E.**	**Coeff.**	**S.E.**
Opt-out dummy	-0.278	0.344	5.063 ***	0.428
Total bid	-0.023 ***	0.004	-	-
Threatened Florida panther	0.718***	0.103	-0.11	0.263
Recovered Florida panther	1.206***	0.106	0.684 ***	0.195
Medium game species	1.458***	0.111	0.678 ***	0.201
High game species	1.962***	0.117	1.058 ***	0.145
Hunting	0.697***	0.09	0.657***	0.166
Fishing	0.458***	0.1	0.026	0.484
1% reduction	0.162	0.157	0.17	0.178
2% reduction	0.16	0.095	0.746***	0.138
Optout X Attitudes towards native species	0.025	0.271		
Optout X Attitudes towards game species	0.236**	0.096		
2% flood risk reduction X Risk perception of flooding	0.03	0.062		
Hunting X Anti-hunting belief	-0.785***	0.095		
Optout X Mutualism belief	-1.767***	0.28		
Recovered X Risk perception of Florida panther	-0.052	0.097		
Recovered X Pro-panther conservation	0.714***	0.107		
Optout X Belief landowners should be paid	-2.343***	0.313		
Log likelihood	-2337.53			
Observations	9,864			
AIC	4729.06			

** Significant at 5% level
*** Significant at 1% level

The coefficient was positive for the interaction variable measuring respondents' attitudes towards game species, meaning people who had positive attitudes towards game species preferred a program that offered a high population level of game species. The interaction between the anti-hunting belief produced from the wildlife value orientation statements and the hunting attribute had a negative coefficient, indicating people with anti-hunting beliefs did not prefer a program with hunting. Similar to the public population, the interaction between the mutualistic belief and the opt-out dummy was negative, showing that people with mutualistic beliefs preferred to pay for a program rather than opt-out. The coefficient on the interaction variable for measuring how important panther conservation was to the respondent was positive, indicating that people who believed it was important to conserve panther population and habitat preferred a program where the panther was recovered. The negative coefficient on the variable that interacted people's belief that landowners should be paid for stewardship demonstrated that people who agreed with giving payments to landowners for maintaining native habitat and wildlife preferred to not opt-out and would rather pay for a conservation program.

3.7 Willingness to Pay

We estimated the public populations and the hunters' and anglers' willingness to pay for each attribute of the program to assess the value they associated with that attribute and its level (Table 3.8). The price is reflective of the total amount each individual would pay based on the number of vehicles registered in their name and the price amount they chose in the SPCE questions, with a 90% confidence interval reflecting the upper and lower bounds of their

willingness to pay. Both populations placed a high negative value on the opt-out option, meaning the option to opt-out was less preferred by the respondents than paying for a program. Both populations positively valued the Florida panther being threatened or recovered compared to endangered, with recovered holding a higher value. However, the hunters and anglers placed a much higher value on the panther being threatened and recovered, $10 and $18 per year respectively, than the public population did ($1 and $5 per year). Both populations were willing to pay for game species populations at a medium or high level, however, the public placed a higher willingness to pay on the medium level, whereas the hunters and anglers were willing to pay more for a high level. Although the hunters and anglers positively valued the opportunity to hunt and fish on private lands at $10 and $6 per year respectively, the public population negatively valued hunting, as well as hiking. The negative willingness to pay by the public population for the hunting and hiking attributes indicated they would not pay for these attributes and are less preferred than the baseline, fishing. Thus, there would need to be a reduction in price for a program that included hunting and hiking. Both the public population and hunters and anglers positively valued a 1% or 2% reduction in flood risk, with both populations valuing the 2% reduction more than the 1%. This is consistent with the fact that 32% of respondents from the hunter and angler population and 29.9% of respondents from the public population paid flood insurance on their property.

Table 3.8: *Public population's (N=874) and hunter and angler population's (N=646) willingness to pay for attributes in the program.*

		Florida Panther		Game Species		Recreation			Flood Risk Reduction	
Population	**Opt-out**	**Threatened**	**Recovered**	**Medium**	**High**	**Hunting**	**Hiking**	**Fishing**	**1%**	**2%**
Public										
WTP	-17.96	1.39	4.85	5.21	3.91	-2.05	-0.01	-	2.70	3.30
Lower bound	-21.82	0.59	3.81	4.20	2.93	-2.86	-0.78	-	1.82	2.38
Upper bound	-13.90	2.20	5.84	6.15	4.84	-1.22	0.75	-	3.52	4.16
Hunters/ Anglers										
WTP	-15.22	9.91	17.95	20.87	28.03	10.49	-	6.26	1.68	3.57
Lower bound	-26.50	6.03	10.75	12.56	16.88	5.99	-	3.20	-0.68	0.83
Upper bound	-2.96	13.25	23.90	27.70	37.15	14.24	-	8.99	3.88	5.97

Chapter 4: Discussion

This study was designed to help explain Florida residents' preferences for financing private land stewardship programs in Florida and measure their willingness to pay for various attributes of the program (ESA status of the Florida panther, population level of game species, outdoor recreational opportunities, and flood risk reduction). The results of this research contribute to the explanation of different demographic and psychological factors that influence individual's preferences for conservation programs, therefore, offering insight to policymakers for developing conservation programs on private lands in Florida. By incorporating a population of the general public in Florida and another population consisting of hunters and anglers in Florida, this study compared the similarities and differences of attribute preferences between cultural and social norms for the two populations.

Shared by other similar studies, I found heterogeneity of preferences for the attributes in the conservation program among both populations (Pienaar et al., 2019). I tested for preference heterogeneity since this data was crucial in determining if there was a significant level of support for funding a program for private land stewardship. This information holds significance for policymakers when deliberating the implementation of a conservation funding structure, specifically an additional fee for Florida standard license plate registration to support private land stewardship practices. By testing for heterogeneity of preferences, I was able to capture accurate results for how respondents valued the program attributes.

Features of the program, including an increased reduction in flood risk and supportive populations for native and game species, were likely to elicit support from the public, hunters,

and anglers. However, consistent with past studies, there was heterogeneity of preferences within the sample (Pienaar, et al., 2019). For example, the public population preferred to have a 2% reduction in flood risk, however, there was a subset of people who did not prefer to have a 2% reduction. Since there was no heterogeneity for the 1% reduction in flood risk, everyone preferred to have a 1% reduction, which is consistent with other studies (Pienaar, et al., 2019).

Different features of the conservation program were more likely to elicit support from the public population than the hunter and angler population. For the public population, on average, respondents preferred a program with a recovered Florida panther population, a medium population level of game species, and a 2% flood risk reduction, and did not prefer a program with hunting. The hunter and angler population preferred a program that offered a recovered panther population, a high level of game species, hunting, and a 1% flood risk reduction.

Although the public had a subset of people who did not prefer the panther to be recovered, the hunter and angler population valued the panther being recovered more so than the public. This does not prove my prediction to be true regarding the hunters and anglers population being less willing to support Florida panther conservation. Previous research contradicts the idea of hunters supporting large carnivore conservation since hunters and large carnivores, such as wolves, panthers, and jaguars, may compete for game species (Treves et al., 2013). However, hunting can be associated with an increased connection with nature, in turn relating to increased mutualism and pro-environmental behavior, which may explain my results of hunters positively valuing Florida panther recovery (Ghasemi & Kyle, 2021).

Based on my results, Florida residents, from both the public population and hunter and angler population, prefer to have a conservation program in place that supports private land stewardship, with only 4% of respondents choosing to opt out of funding all programs presented.

Residents positively valued most of the ecosystem services that private lands offered them, and their welfare would be reduced if there was no conservation program in place. This is consistent with other studies that focus on ecosystem services (Elwell et al., 2018). Although the public population did not positively value the hiking or hunting recreational opportunities, they valued these attributes more than the opt out and preferred to have a conservation program. A reason the public population may not have positively valued the hunting attribute may be because majority of the population, 88.2%, were not hunters, and 91.3% of the population stated they hunted zero to five times a year. The public may also not have positively valued the hiking attribute possibly because the landscape of Florida is primarily flat, and the majority of the population, 67.3%, admitted to hiking zero to five times per year. Previous studies support my findings that people's preferences for outdoor recreational access are influenced by their participation in the activity (Sikder & Mozumder, 2020). Additionally, a reason they may not have positively valued outdoor recreational access is since the majority, approximately 84.4% from both populations, stated they were at least 55 years or older, and previous research shows younger individuals have a stronger preference for outdoor recreational activities (Humagain & Singleton, 2021).

My findings indicated demographic characteristics can relate to engagement in pro-environmental behavior, specifically willingness to pay for a conservation program that supports private land stewardship. From the results of my demographic RPL model, my predictions held true regarding females, individuals with higher incomes, and those with children in their household preferring a conservation program in place for the hunter and angler population. This is consistent with past research that females are more likely to engage in pro-environmental behavior because women have been found to be more concerned with environmental issues (Tindall et al., 2003). Past research also supports people with higher levels of disposable income

being more likely to engage in pro-environmental behaviors (Raymond & Brown, 2011). Additionally, people with children are more likely to engage in pro-environmental behavior due to their bequest motive of preserving the ecosystem and its services for future generations (Kotchen & Reilind, 2000). My prediction that minority populations were less willing to pay for a conservation program was true for Hispanic/Latino and American Indian/Alaska Native groups, however was not true for Asian groups. This may be due to the under sampling of Asian people in the hunter population. Consistent with past studies, members of minority populations are less likely to engage in pro-environmental behavior, whereas they do not historically benefit from conservation programs (Whittaker et al., 2005). For the hunter population, my prediction for people who participated more frequently in outdoor recreational activities, preferring to fund a conservation program proved true through my results. This finding supports past research that there is a positive association between outdoor recreational participation and pro-environmental behavior (Theodori et al., 2010).

The public population showed that respondents with children in their household and females preferred a conservation program rather than opting out of choosing a program. These results are consistent with past studies that concluded females are more likely to engage in pro-environmental behavior (Tindall et al., 2003). The race and ethnicity demographic characteristics of the public population did not produce significant results for if minority populations were more likely to prefer to opt out of choosing to fund a conservation program. The public population results supported my prediction and past research that people who frequent outdoor recreation activities, prefer a conservation program in place (Theodori et al., 2010).

My results demonstrate psychological factors might also influence behavior, in addition to demographics. I predicted individuals with mutualistic beliefs and positive attitudes towards

wildlife and nature were more likely to prefer a conservation program in place and be willing to fund private land stewardship. Consistent with past research, my results from both populations found my prediction to be true and concluded people with mutualistic beliefs are more likely to engage in pro-environmental behavior (Ghasemi & Kyle, 2021). Additionally, I predicted individuals with high risk perceptions of the Florida panther, pertaining to the panther's potential threats towards pets, people, and livestock, and flood risk, were less likely to prefer a program that supports the recovery of the species, and my results from both populations proved this to be true. My findings indicate there may be a subset of people in the public population who did not care for the recovery of the panther due to linking the animal with strong risk perceptions, supporting past research (Kreye et al., 2017).

I also predicted individuals with high risk perceptions of an increased probability of floods were more likely to prefer a program focusing on flood risk reduction rather than no reduction in flood risk. My results demonstrated people on average preferred to have a reduction in flood risk, which is consistent with past findings (Pienaar et al., 2019). However, I cannot conclude people with higher risk perceptions of an increased probability of flooding prefer a higher reduction in flood risk.

Finally, I predicted that the use of climate change language in the survey would cause respondents to answer differently than if climate change was not incorporated in the survey, and those who had climate change denial would not prefer to fund a conservation program. My results concluded there was not a significant difference between respondents who received the survey that incorporated climate change and the ones who received the survey that did not use climate change language. In contrast, past research has found that climate change denial has negatively predicted pro-environmental behavior (Wullenkord & Reese, 2021). However, further

research could benefit from using more rigorous testing for climate change denial. Although respondents were asked about how climate change affected native habitat, wildlife, and flood risk, it is inconclusive whether their responses reflected climate change denial. I was not able to conclude that those who had climate change denial preferred to not fund a conservation program.

Although I place confidence in my results, I believe this research could benefit from using a more accurate sample of Florida's population, seeming as I had under sampled certain demographic groups, which may have led to less accurate results. Additionally, the study would have more accurate results if I were to remove respondents who stated they were not confident that their answers to the SPCE questions reflected how they would vote on the issue. Future studies may find it useful to incorporate how respondents from different regions of Florida responded to the SPCE questions. Since the Florida panther primarily resides in southern Florida, an increase in the population size would cause the panther's range to extend to other regions across the southeastern U.S. Additionally, residents living more inland may not be as concerned with flood risk, or they have not experienced the effects from flooding compared to the coastal communities. Therefore, they may answer differently if there was more communication surrounding the implications of an increased probability of flood risk has on inland communities, such as an increased population density due to coastal flooding. Due to these, my results may have been subject to hypothetical bias and could have benefitted from incorporating regional preferences to obtain a more accurate understanding of residents' willingness to pay for program attributes.

By using the results found in this study, communication regarding program design should appeal to people's beliefs, values, attitudes, and risk perceptions. On average, Florida residents preferred to engage in pro-environmental behavior, however, certain attributes held more value

to some people than others. Since there was a subset of people who preferred to not engage, there is a need to communicate the importance and benefits of conservation programs to the public. According to my results, specific benefits from private land stewardship that should be communicated are those related to the conservation of native habitat, game species, and the Florida panther. Further communication regarding flood risk reduction and other ecosystem services, such as recreational access and support for native species, is needed to effectively engage Florida residents in pro-environmental behavior, as my results indicate these benefits may persuade residents to support private lands conservation. However, since the public population did not positively value the recreational opportunities offered, focusing on recreational access may not prove to be as effective as focusing on conservation of habitat and reducing flood risk. With differing priorities within the programs between the public population and hunters and anglers population, it is important to recognize what could be driving people's behaviors for choosing a program and develop a solution that benefits both populations. It would also be useful to adjust the communication surrounding hunters' preferences on large carnivore conservation, since my results demonstrate hunters and anglers are supportive of downlisting the Florida panther. Psychological factors are key to understanding what drives people's behavior and can be incredibly useful in developing future conservation programs.

Based on my results, I would recommend the use of an additional fee for a standard Florida license plate to help fund private land stewardship programs as a conservation strategy. After concluding that majority of respondents were willing to pay for a private land stewardship program using this funding structure and they were responding to the survey that was consistent with what we know about their current behavior, utilizing an additional fee for registering a Florida vehicle could prove to be a successful management strategy. The public population's

average willingness to pay for a conservation program that helped finance private land stewardship was approximately $2.41, while the hunters and anglers population averaged a higher willingness to pay of $12.34. Additionally, seeming as Florida has one of the largest road networks and highway systems in the country, the state's increasing population and expanding road network contributes to the loss of habitat and global environmental change, such as an increased flood probability and rising sea levels (Forman & Alexander, 1998). Florida resident drivers, who are contributing to global environmental change through their car emissions and support of urban development, would be bearing the cost for the degradation of ecosystem services. Potential concerns with this management strategy include backlash from residents regarding the misuse of their money, the burden is not theirs to bear, and they should not have to pay more taxes. However, it is evident that Florida residents are willing to fund a program for a private land stewardship program and could be successfully implemented through utilizing the funding structure presented in this research.

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Appendices

Appendix 1: List of Tables

Table 2.1: *Stated preference choice experiment's attributes and their levels*

Attribute	**Attribute Levels**
Florida panther population	Endangered Threatened Recovered
Game species population	Low Medium High
Outdoor recreational activity	Hiking Hunting Fishing
Flood risk reduction	No reduction 1% reduction 2% reduction
Additional annual fee for standard license plate	$1 per vehicle $4 per vehicle $8 per vehicle $12 per vehicle

Table 2.2: *Wildlife value orientation statements for hunter and angler population (N=646).*

Measure	Median Response	Strongly Disagree		Disagree		Neither Agree nor Disagree		Agree		Strongly Agree	
		No.	%	No.	%	No.	%	No.	%	No.	%
Humans should manage wild animal populations so that humans benefit.	Agree	47	7.3%	100	15.5%	129	20.0%	187	28.9%	170	26.3%
We should strive for a world where there's an abundance of fish and wildlife for hunting and fishing.	Strongly Agree	12	1.9%	8	1.2%	47	7.3%	205	31.7%	361	55.9%
I care about animals as much as I do other people.	Agree	51	7.9%	92	14.2%	120	18.6%	201	31.1%	169	26.2%
Animals should have rights similar to the rights of humans.	Disagree	177	27.4%	162	25.1%	142	22.0%	94	14.6%	58	9.0%

Wildlife are like my family and I want to protect them.	Neither Agree nor Disagree	98	15.2%	87	13.5%	195	30.2%	173	26.8%	80	12.4%
Hunting is cruel and inhumane to animals.	Strongly Disagree	460	71.2%	104	16.1%	38	5.9%	17	2.6%	10	1.5%
The needs of humans should take priority over fish and wildlife protection.	Neither Agree nor Disagree	94	14.6%	196	30.3%	186	28.8%	116	18.0%	37	5.7%
I feel a strong emotional bond with animals.	Neither Agree nor Disagree	47	7.3%	83	12.8%	204	31.6%	224	34.7%	71	11.0%
We should strive for a world where humans and wildlife and fish can live side by side without fear.	Neither Agree nor Disagree	56	8.7%	88	13.6%	213	33.0%	157	24.3%	115	17.8%
I value the sense of a companionship I	Agree	19	2.9%	29	4.5%	140	21.7%	302	46.7%	132	20.4%

receive from animals.											
Fish and wildlife are on earth primarily for people to use.	Neither Agree nor Disagree	60	9.3%	165	25.5%	152	23.5%	165	25.5%	80	12.4%
Hunting does not respect the lives of animals.	Strongly Disagree	350	54.2%	184	28.5%	61	9.4%	17	2.6%	10	1.5%
I view all living things as part of one big family.	Neither Agree nor Disagree	65	10.1%	118	18.3%	220	34.1%	160	24.8%	59	9.1%
People who want to hunt should be provided the opportunity to do so.	Strongly Agree	1	0.2%	12	1.9%	57	8.8%	188	29.1%	364	56.3%

Table 2.3: *Wildlife value orientation statements for public population (N=874).*

Measure	Median Response	Strongly Disagree		Disagree		Neither Agree nor Disagree		Agree		Strongly Agree	
		No.	%	No.	%	No.	%	No.	%	No.	%

Humans should manage wild animal populations so that humans benefit.	Neither Agree nor Disagree	47	5.4%	150	17.2%	281	32.2%	309	35.4%	87	10.0%
We should strive for a world where there's an abundance of fish and wildlife for hunting and fishing.	Agree	22	2.5%	52	5.9%	206	23.6%	405	46.3%	189	21.6%
I care about animals as much as I do other people.	Agree	34	3.9%	95	10.9%	156	17.8%	363	41.5%	226	25.9%
Animals should have rights similar to the rights of humans.	Neither Agree nor Disagree	69	7.9%	164	18.8%	230	26.3%	276	31.6%	135	15.4%
Wildlife are like my family and I want to protect them.	Agree	39	4.5%	116	13.3%	262	30.0%	309	35.4%	148	16.9%

Hunting is cruel and inhumane to animals.	Neither Agree nor Disagree	118	13.5%	228	26.1%	231	26.4%	188	21.5%	109	12.5%
The needs of humans should take priority over fish and wildlife protection.	Neither Agree nor Disagree	67	7.7%	199	22.8%	284	32.5%	262	30.0%	62	7.1%
I feel a strong emotional bond with animals.	Agree	30	3.4%	82	9.4%	249	28.5%	341	39.0%	172	19.7%
We should strive for a world where humans and wildlife and fish can live side by side without fear.	Agree	17	1.9%	40	4.6%	168	19.2%	393	45.0%	256	29.3%

I value the sense of a companionship I receive from animals.	Agree	10	1.1%	39	4.5%	155	17.7%	424	48.5%	246	28.1%
Fish and wildlife are on earth primarily for people to use.	Neither Agree nor Disagree	80	9.2%	259	29.6%	257	29.4%	215	24.6%	63	7.2%
Hunting does not respect the lives of animals.	Neither Agree nor Disagree	70	8.0%	240	27.5%	221	25.3%	226	25.9%	117	13.4%
I view all living things as part of one big family.	Agree	23	2.6%	105	12.0%	247	28.3%	367	42.0%	132	15.1%
People who want to hunt should be provided the opportunity to do so.	Agree	54	6.2%	95	10.9%	235	26.9%	382	43.7%	108	12.4%

Table 2.4: *Measuring attitudes towards native and game species for hunter and angler population. (N=646).*

Measure	Median Response	Strongly Dislike		Dislike		Neither Dislike or Like		Like		Strongly Like	
		No.	%	No.	%	No.	%	No.	%	No.	%
How much do you like or dislike the following native species?											
Florida scrub jay	Like	3	0.5%	2	0.3%	186	28.8%	188	29%	267	41.3%
Common kingsnake	Like	16	2.5%	31	4.8%	161	24.9%	187	29%	251	38.8%
Florida panther	Strongly Like	13	2.0%	19	2.9%	91	14.1%	187	29%	336	52.0%
Saw palmetto	Like	22	3.4%	40	6.2%	187	29.0%	204	32%	193	29.9%
Coyote	Dislike	181	28.0%	150	23.1%	135	20.9%	92	14%	88	13.6%
Oak toad	Neither Dislike or Like	26	4.0%	40	6.2%	329	50.9%	123	19%	128	19.8%
Do you like or dislike the following game and fish species?											
Bob-white quail	Strongly Like	2	0.3%	0	0.0%	51	7.9%	170	26.4%	422	65.4%
White-tailed deer	Strongly Like	1	0.2%	3	0.5%	11	1.7%	123	19.0%	508	78.6%
Largemouth bass	Strongly Like	2	0.3%	1	0.2%	26	4.0%	157	24.3%	461	71.3%
Wild turkey	Strongly Like	1	0.2%	2	0.3%	19	2.9%	143	22.2%	480	74.3%
Mallard duck	Strongly Like	3	0.5%	5	0.8%	55	8.5%	169	26.1%	414	64.1%
Squirrel	Like	8	1.2%	18	2.8%	106	16.4%	219	33.8%	275	42.6%

Table 2.5: *Measuring attitudes towards native and game species for public population. (N=874).*

Measure	Median Response	Strongly Dislike		Dislike		Neither Dislike or Like		Like		Strongly Like	
		No.	%	No.	%	No.	%	No.	%	No.	%
How much do you like or dislike the following native species?											
Florida scrub jay	Like	4	0.5%	7	0.8%	225	25.7%	386	44.2%	252	28.8%
Common kingsnake	Neither Dislike or Like	185	21.2%	200	22.9%	233	26.7%	164	18.8%	92	10.5%
Florida panther	Like	41	4.7%	44	5.0%	163	18.6%	340	38.9%	286	32.7%
Saw palmetto	Like	42	4.8%	75	8.6%	281	32.2%	327	37.4%	149	17.0%
Coyote	Neither Dislike or Like	70	8.0%	191	21.9%	249	28.5%	248	28.4%	116	13.3%
Oak toad	Neither Dislike or Like	89	10.2%	128	14.6%	357	40.8%	196	22.4%	104	11.9%
Do you like or dislike the following game and fish species?											
Bob-white quail	Like	7	0.8%	16	1.8%	187	21.4%	425	48.6%	239	27.3%
White-tailed deer	Like	6	0.7%	10	1.1%	68	7.8%	370	42.3%	420	48.1%
Largemouth bass	Like	7	0.8%	24	2.7%	177	20.3%	366	41.9%	300	34.3%
Wild turkey	Like	6	0.7%	28	3.2%	149	17.0%	404	46.2%	287	32.8%
Mallard duck	Like	5	0.6%	24	2.7%	109	12.5%	385	44.1%	351	40.2%
Squirrel	Like	16	1.8%	57	6.5%	148	16.9%	360	41.2%	293	33.5%

Table 2.6: *Measuring attitudes towards Florida panther conservation for hunter and angler population. (N=646).*

Measure	Median Response	Not at all important		Slightly Important		Moderately important		Important		Very Important	
		No.	%	No.	%	No.	%	No.	%	No.	%
Conservation of the Florida panther population	Important	27	4.2%	48	7.4%	112	17.3%	209	32.4%	250	38.6%
Protecting habitat for the Florida panther	Important	17	2.6%	33	5.1%	90	14.0%	201	31.1%	304	47.1%

Table 2.7: *Measuring attitudes towards Florida panther conservation for public population. (N=874).*

Measure	Median Response	Not at all important		Slightly Important		Moderately important		Important		Very Important	
		No.	%	No.	%	No.	%	No.	%	No.	%
Conservation of the Florida panther population.	Important	25	2.9%	82	9.4%	189	21.6%	299	34.2%	279	31.9%
Protecting habitat for the Florida panther.	Important	22	2.5%	74	8.5%	158	18.1%	297	34.0%	323	37.0%

Table 2.8: *Measuring risk perception of Florida panther and flood risk for hunter and angler population. (N=646).*

Measure	Median Response	Not at all concerned		Slightly Concerned		Moderately concerned		Concerned		Very Concerned	
		No.	%	No.	%	No.	%	No.	%	No.	%
Loss of habitat for native species	Very Concerned	12	1.9%	59	9.1%	85	13.2%	166	25.7%	324	50.1%
Panthers killing pets	Moderately concerned	124	19.2%	151	23.4%	168	25.9%	106	16.4%	97	15.0%
Panthers killing livestock	Moderately concerned	111	17.2%	160	24.7%	189	29.3%	119	18.4%	67	10.3%
Panthers threatening humans	Slightly Concerned	237	36.6%	120	18.5%	99	15.3%	94	14.6%	96	14.9%
Panthers preying on game species	Slightly Concerned	311	48.1%	114	17.6%	114	17.6%	71	11.0%	36	5.6%
Flooding of your property	Slightly Concerned	299	46.2%	187	28.9%	76	11.8%	50	7.8%	34	5.3%

Table 2.9: *Measuring risk perception of Florida panther and flood risk for public population. (N=874).*

Measure	Median Response	Not at all concerned		Slightly Concerned		Moderately concerned		Concerned		Very Concerned	
		No.	%	No.	%	No.	%	No.	%	No.	%

Loss of habitat for native species	Concerned	26	3.0%	147	16.8%	173	19.8%	252	28.8%	276	31.6%
Panthers killing pets	Concerned	75	8.6%	161	18.4%	191	21.9%	194	22.2%	253	28.9%
Panthers killing livestock	Moderately concerned	101	11.6%	220	25.2%	263	30.1%	204	23.3%	86	9.8%
Panthers threatening humans	Concerned	123	14.1%	139	15.9%	162	18.5%	174	19.9%	276	31.6%
Panthers preying on game species	Slightly Concerned	244	27.9%	211	24.1%	197	22.5%	133	15.2%	89	10.2%
Flooding of your property	Slightly Concerned	275	31.5%	282	32.3%	172	19.7%	85	9.7%	60	6.9%

Table 2.10: *Measuring attitudes towards hunting and fishing for hunter and angler population. (N=646).*

Measure	Median Response	Strongly Oppose		Oppose		Neither Oppose nor Support		Support		Strongly Support	
		No.	%	No.	%	No.	%	No.	%	No.	%
Do you oppose or support the following recreational activities?											
Hunting	Strongly Support	5	0.8%	8	1.2%	43	6.7%	83	13%	508	78.6%
Fishing	Strongly Support	1	0.2%	0	0.0%	10	1.6%	76	12%	559	86.5%

Table 2.11: *Measuring attitudes towards hunting and fishing for public population. (N=874).*

Measure	Median Response	Strongly Oppose		Oppose		Neither Oppose nor Support		Support		Strongly Support	
		No.	%	No.	%	No.	%	No.	%	No.	%
Do you oppose or support the following recreational activities?											
Hunting	Neither Oppose nor Support	112	12.8%	149	17.0%	241	27.6%	193	22.1%	95	10.9%
Fishing	Support	17	1.9%	35	4.0%	183	20.9%	416	47.6%	223	25.5%

Table 2.12: *Statements measuring attitudes towards funding private land stewardship, hunting, and fishing for hunter and angler population. (N=646).*

Measure	Median Response	Strongly Disagree		Disagree		Neither Agree nor Disagree		Agree		Strongly Agree	
		No.	%	No.	%	No.	%	No.	%	No.	%
Private landowners should receive payments to cover the costs of conserving **habitat** on their land.	Agree	31	4.84%	53	8.20%	110	17.07%	270	42%	181	28%
Private landowners should receive payments to cover the costs of conserving **wildlife** on their land.	Agree	28	4.37%	60	9.29%	123	19.04%	256	40%	178	28%
Hunting is part of wildlife conservation	Strongly Agree	4	0.62%	12	1.78%	38	5.84%	114	18%	479	74%
Fishing is part of fish conservation	Strongly Agree	3	0.46%	17	2.63%	60	9.25%	125	19%	441	68%

Table 2.13: *Statements measuring attitudes towards funding private land stewardship, hunting, and fishing for public population (N=874).*

Measure	Median Response	Strongly Disagree		Disagree		Neither Agree nor Disagree		Agree		Strongly Agree	
		No.	%	No.	%	No.	%	No.	%	No.	%
Private landowners should receive payments to cover the costs of conserving **habitat** on their land.	Agree	36	4.12%	103	11.78%	196	22.4%	409	47%	130	14.9%
Private landowners should receive payments to cover the costs of conserving **wildlife** on their land	Agree	34	3.89%	96	10.98%	185	21.2%	410	47%	149	17.0%
Hunting is part of wildlife conservation	Agree	72	8.24%	126	14.42%	214	24.5%	346	40%	116	13.3%
Fishing is part of fish conservation	Agree	34	3.89%	91	10.41%	222	25.4%	388	44%	139	15.9%

Table 2.14: *Variables used in the RPL Models for each population and their description.*

Variable	Description
Opt-out dummy	Captures all other factors not in the choice experiment that could influence the respondent's decision. The respond could choose to opt-out rather than a program.
Total bid	The total payment amount the respondent would be paying based on the program they chose and how many vehicles were registered in their name.
Threatened Florida panther	The Florida panther's status is listed as "threatened".
Recovered Florida panther	The Florida panther's status is listed as "recovered".
Medium game species	There is a medium population level of game species.
High game species	There is a high population level of game species.
Hunting	The recreational opportunity offered in the program is hunting.
Hiking	The recreational opportunity offered in the program is hiking.
Fishing	The recreational opportunity offered in the program is fishing.
1% reduction	There is a 1% reduction in flood risk.
2% reduction	There is a 2% reduction in flood risk.
Female	Interaction term between if the respondent was female and the option to opt-out.
Hispanic	Interaction term between if the respondent was Hispanic and the option to opt-out.
American Indian or Alaska Native	Interaction term between if the respondent was American Indian or Alaska Native and the option to opt-out.
Asian	Interaction term between if the respondent was Asian and the option to opt-out.
Black or African American	Interaction term between if the respondent was Black or African American and the option to opt-out.
Kids in house	Interaction term between if the respondent stated there were members under the age of 18 years in their household and the option to opt-out.
Hunters	Interaction term between if the respondent identified as a hunter and if they chose a program that offered hunting
Income level	Interaction term between the respondent's income level and the option to opt-out.
1% flood risk reduction with kids	Interaction term between if the respondent has members in their household under the age of 18 years and the option to choose a 1% flood risk reduction.
Hunting frequency	Interaction term between the respondent's frequency of hunting and if they chose a program that offered hunting.
Hiking frequency	Interaction term between the respondent's frequency of hiking and if they chose a program that offered hiking.
Attitudes towards native species	Interaction term between the respondent's attitudes towards native species and the option to opt-out.
Attitudes towards game species	Interaction term between the respondent's attitudes towards game species and the option to have a high population level of game species.
Mutualism belief with hiking	Interaction term between if the respondent had a mutualistic belief and the option to choose a program that offered hiking.
Mutualism and opt-out	Interaction term between if the respondent had a mutualistic belief and the option to opt-out.
Risk perception of Florida panther	Interaction term between the respondent's risk perceptions of the Florida panther and if they preferred a program that offered a recovered panther population.
Pro-panther conservation	Interaction term between if the respondent stated it was important to conserve Florida panther populations and their habitat and if they preferred a program where the panther was recovered.

Belief landowners should be paid	Interaction term between if the respondent agreed landowners should receive payments for managing wildlife and habitat on their land and the option to opt-out.
Risk perception of flooding	Interaction term between the respondent's risk perception of flooding and the option to choose a 2% flood risk reduction.
Anti-hunting belief with hunting	Interaction term between if the respondent had anti-hunting beliefs and if they chose a program that offered hunting.

Table 3.1. *Demographic characteristics of the public population (N=874), the hunter/angler population (N=646), and the representative percentages for the state of Florida (N=21,538,87).*

	Florida population	Public		Hunter/ Angler	
Demographic	**%**	**Number**	**%**	**Number**	**%**
Gender					
Male	49	440	50.3	562	87
Female	51	434	49.7	84	13
Choose one or more races that you consider yourself to be.					
American Indian or Alaskan Native	0.5	7	0.8	19	2.9
Asian	3	14	1.6	5	0.8
Black or African American	17	88	10.1	17	2.6
Native Hawaiian or Other Pacific Islander	0.1	0	0	1	0.2
White	76.9	748	85.6	574	88.8
Other/I prefer not to say	-	17	1.9	30	4.6
Are you of Hispanic or Latino origin?					
Yes	26.8	127	14.5	43	6.7
No	73.2	747	85.5	603	93.3
Age					
18-24 years	7.3	43	4.9	46	7.1
25-34 years	16.2	133	15.2	81	12.5
35-44 years	16	132	15.1	125	19.3
45-54 years	16	144	16.5	160	24.8
55-64 years	17.4	156	17.8	208	32.2
65 years or over	27.1	266	30.4	26	4
Education Level					
Less than 12th grade	15.4	16	1.8	6	0.9
High school graduate or GED	15.4	206	23.6	95	14.7
Some college/Associate or technical degree	32.2	260	29.7	234	36.2
Bachelor's degree	22.9	243	27.8	189	29.3
Graduate or professional degree	14	149	17	122	18.9

Are there any members in your household under the age of 18?					
Yes	-	279	31.9	240	37.2
No	-	595	68.1	406	62.8
Do you currently have any pets?					
Yes	-	591	67.6	504	78
No	-	283	32.4	142	22
Are you a hunter?					
Yes	-	103	11.8	511	79.1
No	-	771	88.2	135	20.9
Do you fish recreationally?					
Yes	-	392	44.9	625	96.7
No	-	482	55.1	21	3.3
Income Level (before tax)					
Less than $25,000	17.4	126	14.4	39	6
$25,000 to $49,999	18.7	214	24.5	88	13.6
$50,000 to $99,999	28.1	242	27.7	218	33.7
$100,000 to $199,999	24.2	255	29.2	191	29.6
$200,000 or more	11.6	37	4.2	110	17

Table 3.2: *Basic RPL Model for public population (N=874)*

	Mean		Standard deviation	
	Coeff.	**S.E.**	**Coeff.**	**S.E.**
Opt-out dummy	-2.263**	0.287	4.087 **	0.277
Total bid	-0.045 **	0.005		
Threatened Florida panther	0.212 **	0.074	0.201	0.175
Recovered Florida panther	0.697 **	0.079	0.957 **	0.132
Medium game species	0.714 **	0.070	0.481 **	0.182
High game species	0.486 **	0.074	0.940 **	0.116
Hunting	-0.322 **	0.074	0.498 **	0.143
Hiking	0.032	0.066	0.183	0.253
1% reduction	0.351 **	0.064	0.101	0.112
2% reduction	0.425 **	0.067	0.741 **	0.105

** Significant at 5% level

Table 3.3: *Basic RPL Model for the hunters and anglers population (N=646)*

	Mean		Standard deviation	
	Coeff.	**S.E.**	**Coeff.**	**S.E.**
Opt-out dummy	-0.327	0.396	5.661 **	0.439
Total bid	-0.025 **	0.004		
Threatened Florida panther	0.680 **	0.101	0.218	0.187
Recovered Florida panther	1.225 **	0.107	0.904 **	0.164
Medium game species	1.410 **	0.108	0.610 **	0.210
High game species	1.888 **	0.117	0.957 **	0.149
Hunting	0.704 **	0.095	0.963 **	0.963
Fishing	0.434 **	0.101	0.419	0.509
1% reduction	0.187 **	0.089	0.242	0.200
2% reduction	0.153	0.091	0.384	0.240

** Significant at 5% level

Table 3.4: *Demographic RPL Model for the public population (N=874)*

	Mean		Standard deviation	
	Coeff.	**S.E.**	**Coeff.**	**S.E.**
Opt-out dummy	-1.53***	0.422	3.983 ***	0.289
Total bid	-0.45***	0.005	-	-
Threatened Florida panther	0.219***	0.075	0.148	0.197
Recovered Florida panther	0.721***	0.082	1.065***	0.12
Medium game species	0.737***	0.072	0.593***	0.149
High game species	0.493***	0.075	0.988***	0.12
Hunting	-0.397***	0.078	0.545 ***	0.125
Hiking	-0.152	0.081	0.113	0.217
1% reduction	0.369***	0.064	0.111	0.114
2% reduction	0.426***	0.068	0.819***	0.106
Female	0.73**	0.357		
Hispanic	-0.604	0.529		
American Indian or Alaska Native	3.22***	1.05		
Asian	-1.408	1.37		
Kids in house	-1.995***	0.439		
Hunters	0.544***	0.171		
Income level	-0.003	0.003		

Hiking frequency	0.03***	0.008

** Significant at 5% level
*** Significant at 1% level

Table 3.5: *Demographic RPL Model for the hunters and anglers population (N=646)*

	Mean		Standard deviation	
	Coeff.	**S.E.**	**Coeff.**	**S.E.**
Opt-out dummy	1.064**	0.542	6.162 ***	0.517
Total bid	-0.026***	0.004	-	-
Threatened Florida panther	0.685***	0.103	0.275	0.203
Recovered Florida panther	1.269***	0.112	1.03 ***	0.155
Medium game species	1.46***	0.11	0.713 ***	0.182
High game species	1.952***	0.12	1.053 ***	0.147
Hunting	-0.212	0.132	0.688***	0.145
Fishing	-0.381	0.255	0.58***	0.211
1% reduction	0.272**	0.107	0.103	0.192
2% reduction	0.182	0.094	0.437	0.209
Female	-1.877***	0.699		
Hispanic	-1.114	0.681		
American Indian or Alaska Native	-6.497***	1.241		
Asian	6.677***	1.594		
Black or African American	1.847	1.263		
Kids in house	-1.554***	0.545		
Income level	-0.009**	0.004		
1% flood reduction with kids	-0.162	0.153		
Hunting frequency	0.085***	0.009		
Fishing frequency	0.054***	0.013		

** Significant at 5% level
*** Significant at 1% level

Table 3.6: *Psychological RPL Model for the public population (N=874)*

	Mean		Standard deviation	
	Coeff.	**S.E.**	**Coeff.**	**S.E.**
Opt-out dummy	-2.197***	0.267	3.61 ***	0.259
Total bid	-0.045***	0.005	-	-

Threatened Florida panther	0.205***	0.076	0.287	0.17
Recovered Florida panther	0.68***	0.081	0.978***	0.129
Medium game species	0.726***	0.071	0.497***	0.17
High game species	0.471***	0.075	0.954***	0.114
Hunting	-0.334***	0.074	0.441 ***	0.153
Hiking	0.009	0.66	0.081	0.27
1% reduction	0.361***	0.064	0.14	0.112
2% reduction	0.417***	0.068	0.848***	0.107
Attitudes towards native species	-0.791***	0.197		
Attitudes towards game species	0.315***	0.076		
Mutualism belief with hiking	0.154***	0.058		
Mutualism and opt-out	-0.657***	0.197		
Risk perception of Florida panther	-0.251***	0.077		
Pro-panther conservation	0.337***	0.079		
Belief landowners should be paid	-1.122***	0.219		
Supportive of hunting	0.218***	0.062		

** Significant at 5% level
*** Significant at 1% level

Table 3.7: *Psychological RPL Model for the hunters and anglers population (N=646)*

	Mean		**Standard deviation**	
	Coeff.	**S.E.**	**Coeff.**	**S.E.**
Opt-out dummy	-0.278	0.344	5.063 ***	0.428
Total bid	-0.023 ***	0.004	-	-
Threatened Florida panther	0.718***	0.103	0.11	0.263
Recovered Florida panther	1.206***	0.106	0.684 ***	0.195
Medium game species	1.458***	0.111	0.678 ***	0.201
High game species	1.962***	0.117	1.058 ***	0.145
Hunting	0.697***	0.09	0.657***	0.166
Fishing	0.458***	0.1	0.026	0.484
1% reduction	0.162	0.157	0.17	0.178
2% reduction	0.16	0.095	0.746***	0.138
Attitudes towards native species	0.025	0.271		

Attitudes towards game species	0.236**	0.096
Risk perception of flooding	0.03	0.062
Anti-hunting belief with hunting	-0.785***	0.095
Mutualism belief with opt out	-1.767***	0.28
Risk perception of Florida panther	-0.052	0.097
Pro-panther conservation	0.714***	0.107
Belief landowners should be paid	-2.343***	0.313

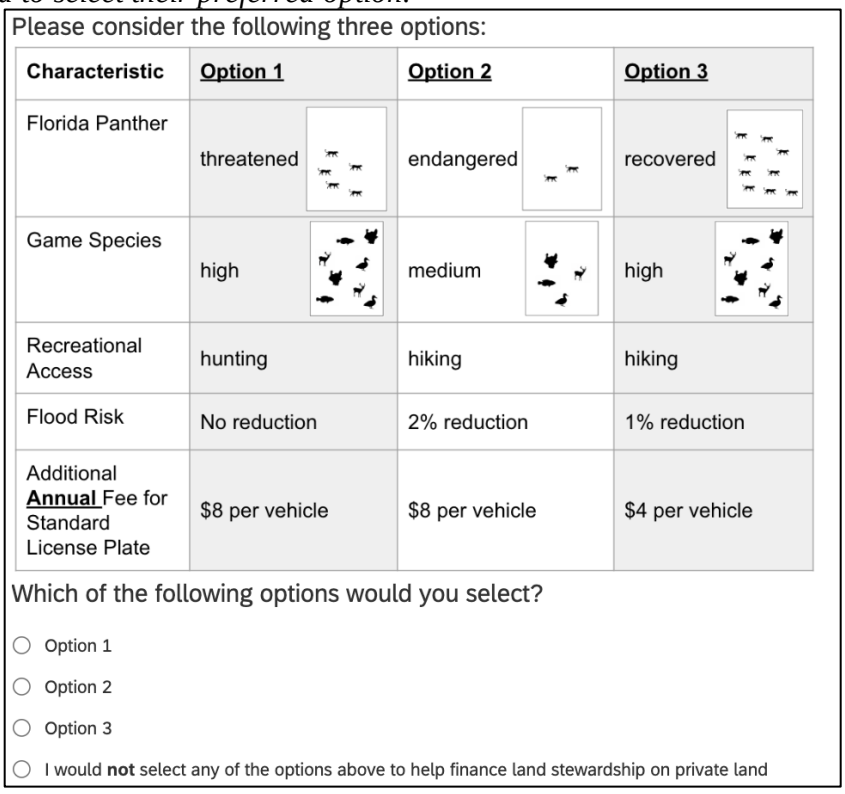
** Significant at 5% level
*** Significant at 1% level

Table 3.8: *Public population's (N=874) and hunter and angler population's (N=646) willingness to pay for attributes in the program.*

		Florida Panther		Game Species		Recreation			Flood Risk Reduction	
Population	**Opt-out**	**Threatened**	**Recovered**	**Medium**	**High**	**Hunting**	**Hiking**	**Fishing**	**1%**	**2%**
Public										
WTP	-17.96	1.39	4.85	5.21	3.91	-2.05	-0.01	-	2.70	3.30
Lower bound	-21.82	0.59	3.81	4.20	2.93	-2.86	-0.78	-	1.82	2.38
Upper bound	-13.90	2.20	5.84	6.15	4.84	-1.22	0.75	-	3.52	4.16
Hunters/ Anglers										
WTP	-15.22	9.91	17.95	20.87	28.03	10.49	-	6.26	1.68	3.57
Lower bound	-26.50	6.03	10.75	12.56	16.88	5.99	-	3.20	-0.68	0.83
Upper bound	-2.96	13.25	23.90	27.70	37.15	14.24	-	8.99	3.88	5.97

Appendix 2: List of Figures

Figure 2.1: *Example of a choice card within the survey where the respondent is asked to select their preferred option.*



Please consider the following three options:

Characteristic	Option 1	Option 2	Option 3
Florida Panther	threatened	endangered	recovered
Game Species	high	medium	high
Recreational Access	hunting	hiking	hiking
Flood Risk	No reduction	2% reduction	1% reduction
Additional **Annual** Fee for Standard License Plate	$8 per vehicle	$8 per vehicle	$4 per vehicle

Which of the following options would you select?

- ○ Option 1
- ○ Option 2
- ○ Option 3
- ○ I would **not** select any of the options above to help finance land stewardship on private land

Figure 2.2: *Table shown after choice card 1 to reinforce total payment amount based on number of vehicles respondent had registered and which program was chosen*

If you chose one of the options, you are paying an **additional yearly fee** for a Standard Florida license plate. The table below shows how the total amount you would pay changes if the additional fee was $8.

Number of Cars	Standard Fee	Additional Fee	Total per Year
1 car	$25	$8	$33 per year
2 cars	$50	$16	$66 per year
3 cars	$75	$24	$99 per year
4 cars	$100	$32	$132 per year

Do you wish to change your previous answer?

Yes

No

Figure 2.3: *Possible Florida panther locations based on their population status as described in the survey*

Figure 2.4: *Game species levels as described in the survey*

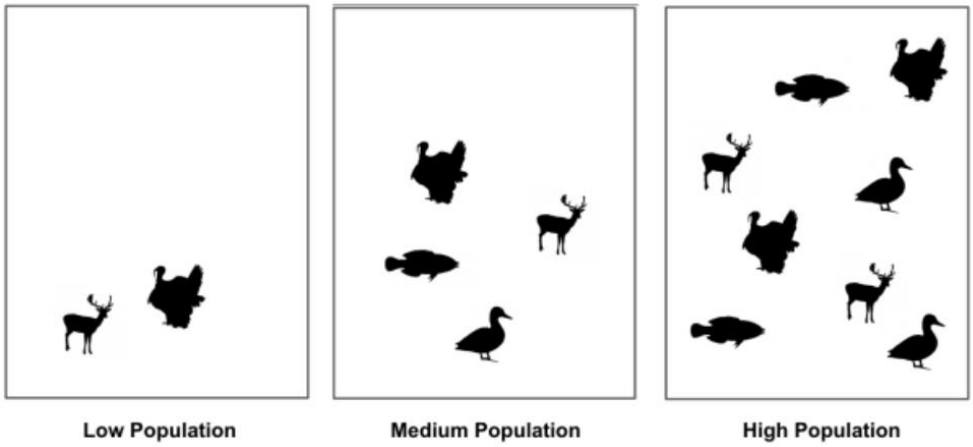


Figure 2.5: *Florida counties and regions used for population quotas*

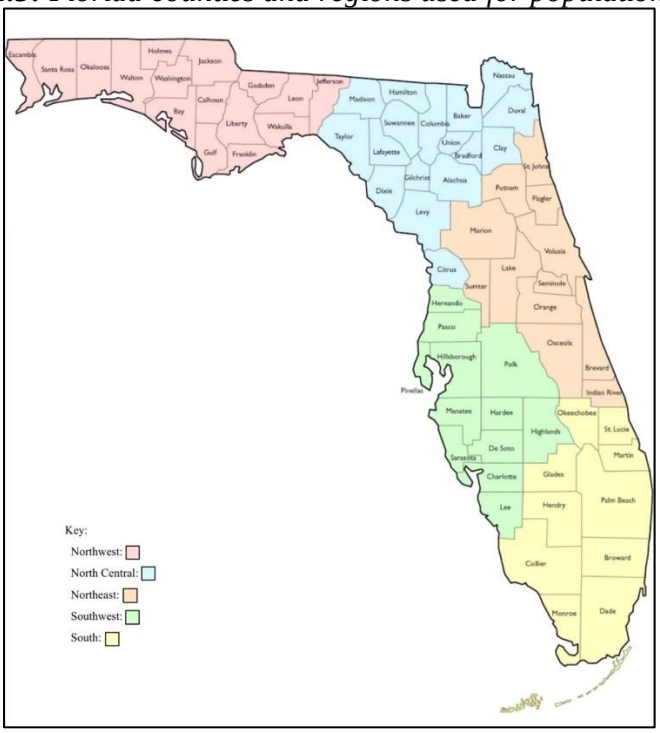


Figure 2.6*: Eigenvalues greater than 1 for Factor 1 and 2 for public population (N=874)*

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	4.54385	3.04871	0.7201	0.7201
Factor2	1.49515	0.67922	0.2370	0.9571
Factor3	0.81593	0.54403	0.1293	1.0864
Factor4	0.27190	0.11102	0.0431	1.1295
Factor5	0.16088	0.08276	0.0255	1.1550
Factor6	0.07812	0.12626	0.0124	1.1674
Factor7	-0.04815	0.01956	-0.0076	1.1597
Factor8	-0.06770	0.01955	-0.0107	1.1490
Factor9	-0.08725	0.03855	-0.0138	1.1352
Factor10	-0.12579	0.02144	-0.0199	1.1152
Factor11	-0.14724	0.01032	-0.0233	1.0919
Factor12	-0.15756	0.03348	-0.0250	1.0669
Factor13	-0.19105	0.04024	-0.0303	1.0367
Factor14	-0.23129	.	-0.0367	1.0000

LR test: independent vs. saturated: chi2(91) = 8.2e+04 Prob>chi2 = 0.0000

Figure 2.7*: Factor loadings on Factor 1 and 2 for WVO statements for public population (N=874)*

Variable	Factor 1	Factor 2	Uniqueness
Humans should manage wild animal populations so that humans benefit	-0.0390	-0.2483	0.9368
We should strive for a world where there's an abundance of fish and wildlife for hunting and fishing	0.1573	-0.5086	0.7166
I care about animals as much as I do other people	0.6827	0.1246	0.5184
Animals should have rights similar to the rights of humans	0.7013	0.2842	0.4274
Wildlife are like my family and I want to protect them	0.7991	0.1716	0.3320
Hunting is cruel and inhumane to animals	0.2671	0.7579	0.3542
The needs of humans should take priority over fish and wildlife protection	- 0.2863	- 0.1622	0.8917
I feel a strong emotional bond with animals	0.7575	0.1669	0.3984
We should strive for a world where humans and wildlife and fish can live side by side	0.4836	0.1621	0.7398

I value the sense of companionship I receive from animals	0.6983	0.0262	0.5117
Fish and wildlife are on earth primarily for people to use	- 0.2048	- 0.2895	0.8743
Hunting does not respect the lives of animals	0.2799	0.7387	0.3760
I view all living things as part of one big family	0.6739	0.2704	0.4727
People who want to hunt should be provided the opportunity to do so	- 0.1444	- 0.7539	0.4108

***Figure 2.8**: Eigenvalues greater than 1 for Factor 1 and 2 for hunter and angler population (N=646)*

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	3.96232	2.38316	0.7320	0.7320
Factor2	1.57916	1.12459	0.2917	1.0237
Factor3	0.45457	0.15072	0.0840	1.1076
Factor4	0.30385	0.19498	0.0561	1.1638
Factor5	0.10887	0.00501	0.0201	1.1839
Factor6	0.10386	0.12857	0.0192	1.2031
Factor7	-0.02472	0.03555	-0.0046	1.1985
Factor8	-0.06027	0.03575	-0.0111	1.1874
Factor9	-0.09601	0.02436	-0.0177	1.1696
Factor10	-0.12038	0.03149	-0.0222	1.1474
Factor11	-0.15187	0.03841	-0.0281	1.1193
Factor12	-0.19028	0.01055	-0.0352	1.0842
Factor13	-0.20083	0.05409	-0.0371	1.0471
Factor14	-0.25492	.	-0.0471	1.0000

LR test: independent vs. saturated: chi2(91) = 4.6e+04 Prob>chi2 = 0.0000

***Figure 2.9**: Factor loadings on Factor 1 and 2 for WVO statements for hunter and angler population (N=646)*

Variable	Factor 1	Factor 2	Uniqueness
Humans should manage wild animal populations so that humans benefit	- 0.1319	- 0.3403	0.8668
We should strive for a world where there's an abundance of fish and	0.1436	- 0.4694	0.7591

wildlife for hunting and fishing			
I care about animals as much as I do other people	0.6760	- 0.0435	0.5412
Animals should have rights similar to the rights of humans	0.7235	0.2339	0.4218
Wildlife are like my family and I want to protect them	0.7585	0.0970	0.4153
Hunting is cruel and inhumane to animals	0.1831	0.6952	0.4831
The needs of humans should take priority over fish and wildlife protection	- 0.4794	- 0.0650	0.7660
I feel a strong emotional bond with animals	0.6684	0.0709	0.5482
We should strive for a world where humans and wildlife and fish can live side by side	0.5948	0.1240	0.6309
I value the sense of companionship I receive from animals	0.5711	0.0508	0.6712
Fish and wildlife are on earth primarily for people to use	- 0.4057	- 0.3100	0.7393
Hunting does not respect the lives of animals	0.1556	0.7073	0.4755
I view all living things as part of one big family	0.6514	0.1378	0.5567
People who want to hunt should be provided the opportunity to do so	- 0.0487	- 0.6436	0.5835

Appendix 3: Preferences for Private Land Stewardship Survey

Consent

Dear Participant,

My name is Ava Hiller and I am a student in the Department of Agricultural and Applied Economics at the University of Georgia under the supervision of Dr. Elizabeth Pienaar and Dr. Jeff Mullen. I am inviting you to take part in a research study.

This research is an independent study conducted by the University of Georgia. The study is designed to understand the Florida public's opinions on conserving and managing habitat on private land in Florida. If you take part in this study, we will ask your opinions on Florida wildlife, flood risk, your outdoor recreational activities and funding for conservation in Florida. Your participation in this survey will help provide information on how the public would like conservation programs in Florida to be structured and what conservation benefits are important to Florida residents.

If you agree to take part in this study you will complete an online survey. The survey will take 10-15 minutes to complete.

Participation is voluntary. You can refuse to take part or stop at any time without penalty. The information you provide will remain confidential. This information will be used to generate reports and manuscripts, but only deidentified data will be reported, i.e., your responses cannot be traced back to you.

This research involves the transmission of data over the Internet. Every reasonable effort has been taken to ensure the effective use of available technology; however,

confidentiality during online communication cannot be guaranteed.

Any incentive received for completing this survey is managed by Qualtrics and follows their policies.

You must be at least 18 years of age to participate in this study.

If you have any questions about the study, please contact Ava Hiller at agh11296@uga.edu, Dr. Elizabeth Pienaar at efp53643@uga.edu, or Dr. Jeffrey Mullen at jmullen@uga.edu.

If you have any complaints or questions about your rights as a research volunteer, contact the IRB at 706-542-3199 or by email at IRB@uga.edu.

Are you at least 18 years of age?

Yes

No

Do you **agree** to participate in this study?

Yes

No

Demographics

Are you currently a resident of Florida?

Yes

No

What county do you live in?

Please provide your zip code.

What is your gender?

Male
Female
Non-binary
Prefer not to say

What is your age?

18 to 24 years
25 to 34 years
35 to 44 years
45 to 54 years
55 to 64 years
65 to 74 years
75 years or over

What is the highest degree or level of school that you have completed?

Less than 12th grade
High school graduate or GED
Some college / associate or technical degree
Bachelor's degree
Graduate or professional degree

Are you of Hispanic or Latino origin?

Yes
No
I prefer not to say

Choose one or more races that you consider yourself to be.

American Indian or Alaska Native
Asian
Black or African American
Native Hawaiian or Other Pacific Islander
White
Other
I prefer not to say

Are there any members in your household under the age of 18?

Yes
No

Do you currently have any pets?

Yes
No

What kind of pets do you have?

Cat
Dog
Bird
Fish
Rodent or small mammal
Reptile (such as snake, lizard, turtle, or tortoise)
Amphibian (such as frog, toad, salamander, or newt)
Insect/arachnid
Other:
I don't have any pets

Are you a hunter?

Yes

No

What do you use to hunt with? *Select all that apply.*

Dogs

Bow and arrow

Firearms

Other:

I do not hunt

Do you fish recreationally?

Yes

No

What do you fish for?

Freshwater fish

Saltwater fish

Both freshwater fish and saltwater fish

I do not fish

Please indicate your annual income (before tax).

Less than $25,000

$25,000 to $49,999

$50,000 to $99,999

$100,000 to $199,999

$200,000 or more

Private Land Stewardship

Landowners can earn a living from livestock production and other agricultural activities, while implementing land stewardship practices that reduce soil erosion, improve wildlife habitat, and protect native vegetation and wildlife, such as:

Florida scrub jay

Common kingsnake

Florida panther

Saw palmetto

Coyote

Oak toad

How much do you **like or dislike** the following native species?

	Strongly **dislike**	Dislike	Neither like nor dislike	Like	Strongly **like**
Florida scrub jay	○	○	○	○	○
Common kingsnake	○	○	○	○	○
Florida panther	○	○	○	○	○
Saw palmetto	○	○	○	○	○
Coyote	○	○	○	○	○
Oak toad	○	○	○	○	○

Increased **urban development** is one of the causes of loss of habitat for native species.

How **concerned** are you about loss of habitat for native species?

Not at all concerned

Slightly concerned

Moderately concerned

Concerned

Very concerned

How much do you agree or disagree with the following statements?

	Strongly **disagree**	Disagree	Neither agree nor disagree	Agree	Strongly **agree**
Private landowners should receive payments to cover the costs of conserving **habitat** on their land	○	○	○	○	○
Private landowners should receive payments to cover the costs of conserving **wildlife** on their land	○	○	○	○	○

Habitat for Game Species

Private lands can be managed to support game species and fish populations that can be hunted or fished in Florida, such as the following:

Bobwhite quail

White-tailed deer

Largemouth bass

Wild turkey

Mallard duck

Grey Squirrel

Do you **like or dislike** the following game and fish species?

	Strongly **dislike**	Dislike	Neither like nor dislike	Like	Strongly **like**
Bob-white quail	○	○	○	○	○
White-tailed deer	○	○	○	○	○
Largemouth bass	○	○	○	○	○
Wild turkey	○	○	○	○	○
Mallard duck	○	○	○	○	○
Squirrel	○	○	○	○	○

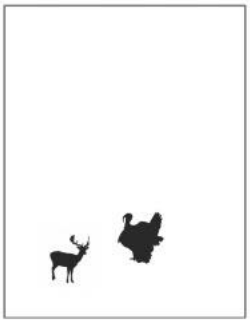
Do you **oppose or support** the following recreational activities?

	Strongly oppose	Oppose	Neither oppose nor support	Support	Strongly support
Hunting	○	○	○	○	○
Fishing	○	○	○	○	○

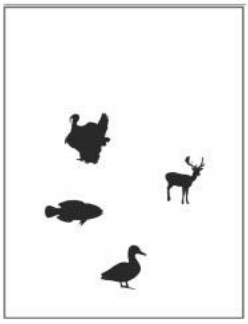
Do you **agree or disagree** with the following statements?

	Strongly **disagree**	Disagree	Neither agree nor disagree	Agree	Strongly **agree**
Hunting is part of wildlife conservation	○	○	○	○	○
Fishing is part of fish conservation	○	○	○	○	○

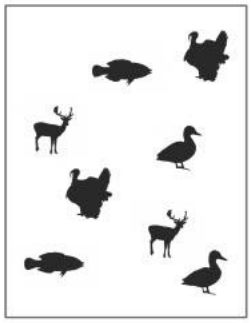
More private land managed for game and fish species increases game and fish populations.



Low Population



Medium Population



High Population

What level of game and fish populations on private lands would you prefer?

Low

Medium

High

It does not matter to me

Florida Panther Recovery

Conservation of habitat on private lands is critical to conservation and protecting the Florida panther. The Florida panther is currently listed as **endangered** under the Endangered Species Act (ESA), meaning they are at a high risk of becoming extinct in the wild.

- **Endangered**: a single breeding population of 240 adults
- **Threatened**: two breeding populations of at least 240 adults each in Florida
- **Recovered**: three breeding populations of at least 240 adults each in the Southeast

This is where Florida panthers would be located based on their population status:

Endangered **Threatened** **Recovered**

What level would you prefer the Florida panther to be? *(1 meaning endangered and 10 meaning recovered) Please slide the bar.*

Loss of habitat from urban development is a key threat to the Florida panther. There is insufficient public land to effectively protect the Florida panther. Panther recovery depends on the conservation of habitat on private lands. Panthers usually eat deer and other native species, but they may also kill and eat livestock and pets. When panthers

kill pets, livestock or game species, this can cause conflicts with people.

How **important** are the following to you?

	Not at all important	Slightly important	Moderately important	Important	Very important
Conservation of the Florida panther population	○	○	○	○	○
Protecting habitat for the Florida panther	○	○	○	○	○

How **concerned** are you about the following?

	Not at all concerned	Slightly concerned	Moderately concerned	Concerned	Very concerned
Panthers killing **livestock**	○	○	○	○	○
Panthers killing **pets**	○	○	○	○	○
Panthers threatening **humans**	○	○	○	○	○
Panthers preying on **game species**	○	○	○	○	○

Outdoor Recreational Access

The natural lands maintained by private landowners may offer access to the following recreational activities, which would not be possible if converted to urban development:

- **Hunting** of game species such as white-tailed deer, wild turkey, and bobwhite quail
- **Fishing** on rivers, streams, and lakes
- **Hiking** for nature appreciation, bird-watching, and wildlife-watching

On average, how often do you, or members of your household, engage in the following outdoor recreational activities?

	Never	1-5 times per year	6-10 times per year	11-20 times per year	21 or more times per year
Hunting	○	○	○	○	○
Fishing	○	○	○	○	○
Hiking	○	○	○	○	○

Flood Protection

Currently, Florida has approximately 2.3 million properties that are at risk of flooding over the next 30 years (the average length of a mortgage). Properties in a floodplain have a 26% chance of flooding **at least** once during that 30-year period. Properties outside of a floodplain may also be exposed to flooding.

The natural lands that are cared for by private landowners help protect properties from flooding by absorbing heavy rain and redirecting runoff, in contrast to urban areas.

Do you pay flood insurance?

Yes
No
I don't know

How **concerned** are you about flooding of your property?

Not at all concerned
Slightly concerned
Moderately concerned
Concerned
Extremely concerned

Habitat for Game Species-Climate

Private lands can be managed to support game species and fish populations that can be hunted or fished in Florida, such as the following:

Bobwhite quail

White-tailed deer

Largemouth bass

Wild turkey

Mallard duck

Grey Squirrel

Do you **like or dislike** the following game and fish species?

	Strongly **dislike**	Dislike	Neither like nor dislike	Like	Strongly **like**
Bob-white quail	○	○	○	○	○
White-tailed deer	○	○	○	○	○
Largemouth bass	○	○	○	○	○
Wild turkey	○	○	○	○	○
Mallard duck	○	○	○	○	○
Squirrel	○	○	○	○	○

Do you **oppose or support** the following recreational activities?

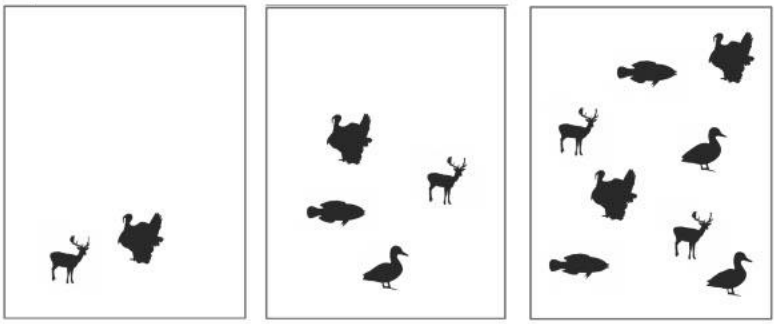
	Strongly oppose	Oppose	Neither oppose nor support	Support	Strongly support
Hunting	○	○	○	○	○

	Strongly oppose	Oppose	Neither oppose nor support	Support	Strongly support
Fishing	○	○	○	○	○

Do you **agree or disagree** with the following statements?

	Strongly **disagree**	Disagree	Neither agree nor disagree	Agree	Strongly **agree**
Hunting is part of wildlife conservation	○	○	○	○	○
Fishing is part of fish conservation	○	○	○	○	○

More private land managed for game and fish species increases game and fish populations.



Low Population **Medium Population** **High Population**

What level of game and fish populations on private lands would you prefer?

Low

Medium

High

It does not matter to me

Climate change is a threat to wildlife, including fish and game populations. With changing temperatures and weather patterns, habitats that are suitable for game and fish species are shifting, causing wildlife and fish to migrate to new areas.

How **concerned** are you about climate change affecting **fish** and **game populations**?

Not at all concerned
Slightly concerned
Moderately concerned
Concerned
Very concerned

Do you agree or disagree that climate change is an issue that needs to be addressed?

Strongly disagree
Disagree
Neither agree nor disagree
Agree
Strongly agree

Florida Panther Recovery-Climate

Conservation of habitat on private lands is critical to conserving and protecting the Florida panther. The Florida panther is currently listed as **endangered** under the Endangered Species Act (ESA), meaning they are at a high risk of becoming extinct in the wild.

- **Endangered**: a single breeding population of 240 adults
- **Threatened**: two breeding populations of at least 240 adults each in Florida
- **Recovered**: three breeding populations of at least 240 adults each in the Southeast

This is where Florida panthers would be located based on their population status:

Endangered Threatened Recovered

What level would you prefer the Florida panther to be? *(1 meaning endangered and 10 meaning recovered) Please slide the bar.*

	Endangered				Threatened				Recovered		It does not matter to me
	1	2	3	4	5	6	7	8	9	10	
Panther population level											☐

Loss of habitat from urban development is a key threat to the Florida panther. There is insufficient public land to effectively protect the Florida panther. Panther recovery depends on the conservation of habitat on private lands. Panthers usually eat deer and other native species, but they may also kill and eat livestock and pets. When panthers kill pets, livestock or game species, this can cause conflicts with people.

How **important** are the following to you?

	Not at all important	Slightly important	Moderately important	Important	Very important
Conserve the Florida panther	○	○	○	○	○
Protecting habitat for the Florida panther	○	○	○	○	○

How **concerned** are you about the following?

	Not at all concerned	Slightly concerned	Moderately concerned	Concerned	Very concerned
Panthers killing **livestock**	○	○	○	○	○
Panthers killing **pets**	○	○	○	○	○
Panthers threatening **humans**	○	○	○	○	○
Panthers preying on **game species**	○	○	○	○	○

Climate change is also a threat to the Florida panther. With changing temperatures and weather patterns, habitats that are suitable for the Florida panther are shifting, causing them to relocate. New areas of protected habitat are needed to help recover the species.

How **concerned** are you about climate change affecting the population of the **Florida panther**?

Not at all concerned
Slightly concerned
Moderately concerned
Concerned
Very concerned

Outdoor Recreational Access-Climate

The natural lands maintained by private landowners may offer access to the following recreational activities, which would not be possible if converted to urban development:

- **Hunting** of game species such as white-tailed deer, wild turkey, and bobwhite quail
- **Fishing** on rivers, streams, and lakes
- **Hiking** for nature appreciation, bird-watching, and wildlife-watching

On average, how often do you, or members of your household, engage in the following

outdoor recreational activities?

	Never	1-5 times per year	6-10 times per year	11-20 times per year	21 or more times per year
Hunting	○	○	○	○	○
Fishing	○	○	○	○	○
Hiking	○	○	○	○	○

Flood Protection- Climate

Currently, Florida has approximately 2.3 million properties that are at risk of flooding over the next 30 years (the average length of a mortgage). Properties in a floodplain have a 26% chance of flooding **at least** once during that 30-year period. Properties outside of a floodplain may also be exposed to flooding.

The natural lands that are cared for by private landowners help protect properties from flooding by absorbing heavy rain and redirecting runoff, in contrast to urban areas.

Do you pay flood insurance?

Yes
No
I don't know

How **concerned** are you about flooding of your property?

Not at all concerned
Slightly concerned
Moderately concerned
Concerned
Extremely concerned

How much do you **agree or disagree** with the following statement:

Climate change causes an increase in the probability that my property will flood.

Strongly disagree
Disagree
Neither agree nor disagree
Agree
Strongly agree

Funding Private Land Stewardship of Natural Lands

It costs approximately $25 a year to register a vehicle for a standard license plate. An additional fee could be added to annual vehicle registration to finance private lands stewardship.

How many vehicles are registered in your name?

0
1
2
3
4 or more

Please specify the number of vehicles registered in your name.

Would you be supportive of an **additional** fee (between $1 and $12) for registering or renewing a Florida license plate to finance land stewardship?

Yes
No
Maybe

Your Preference Related to Private Landowner Stewardship for Conserving Wildlife

We will now ask you 4 questions about your preferences related to private lands stewardship and whether you would pay to fund conservation on private lands.

This EXAMPLE question shows you how to fill in the four questions that you will find next:
Please consider the following three options:

Step 1: Decide if you like any of the options.

Characteristic	Option 1	Option 2	Option 3
Florida Panther	recovered 	threatened 	endangered 
Game Species	medium 	low 	high 
Recreational Access	hiking	fishing	hunting
Flood Risk	1% reduction	2% reduction	No reduction
Additional Fee for Standard License Plate	$12	$8	$4

Which of the options would you select? *Check one box.*

- ❑ Option 1
- ❑ Option 2
- ❑ Option 3
- ❑ I would **not** select any of the options above to help finance private land stewardship.

Step 2: Decide if you would pay for **ONE** of the options.

If you choose not to select any of the options, then you are choosing not to help finance land stewardship on private land, and the land may be converted to urban development.

If you choose one of the options, then you are providing information about which conservation outcomes are important to you and how much you would pay to maintain them.

Increased abundance of wildlife and fish species on private lands does not guarantee you get to hunt or fish these animals.

Private landowners may choose to allow certain recreational activities on their land (hunting, hiking, **OR** fishing).

No reduction in flood risk means that the probability that properties in a floodplain will flood at least once every 30 years remains 26%. A **1% reduction** in flood risk means

that the risk of flooding falls to 25%. A **2% reduction** in flood risk means that the risk of flooding falls to 24%.

Each vehicle registered in your name in Florida will require its own registration fee yearly (one payment for each vehicle per year).

Set 1

Please consider the following three options:

Characteristic	Option 1	Option 2	Option 3
Florida Panther	threatened 	endangered 	recovered 
Game Species	high 	medium 	high 
Recreational Access	hunting	hiking	hiking
Flood Risk	No reduction	2% reduction	1% reduction
Additional **Annual** Fee for Standard License Plate	$8 per vehicle	$8 per vehicle	$4 per vehicle

Which of the following options would you select?

Option 1

Option 2

Option 3

I would **not** select any of the options above to help finance land stewardship on private land

If you chose one of the options, you are paying an **additional yearly fee** for a Standard Florida license plate. The table below shows how the total amount you would pay changes if the additional fee was $8.

Number of Cars	Standard Fee	Additional Fee	Total per Year
1 car	$25	$8	$33 per year
2 cars	$50	$16	$66 per year
3 cars	$75	$24	$99 per year
4 cars	$100	$32	$132 per year

Do you wish to change your previous answer?

Yes

No

If you chose one of the options, you are paying an **additional yearly fee** for a Standard Florida license plate. The table below shows how the total amount you would pay changes if the additional fee was $4.

Number of Cars	Standard Fee	Additional Fee	Total per Year
1 car	$25	$4	$29 per year
2 cars	$50	$8	$58 per year
3 cars	$75	$12	$87 per year
4 cars	$100	$16	$116 per year

Do you wish to change your previous answer?

Yes

No

Please consider the following three options:

Characteristic	Option 1	Option 2	Option 3
Florida Panther	threatened 	endangered 	recovered 
Game Species	high 	medium 	high 
Recreational Access	hunting	hiking	hiking
Flood Risk	No reduction	2% reduction	1% reduction
Additional **Annual** Fee for Standard License Plate	$8 per vehicle	$8 per vehicle	$4 per vehicle

Which of the following options would you select?

Option 1

Option 2

Option 3

I would **not** select any of the options above to help finance land stewardship on private land

Please consider the following three options:

Characteristic	Option 1	Option 2	Option 3
Florida Panther	recovered 	recovered 	recovered 
Game Species	low 	medium 	low 
Recreational Access	fishing	hunting	hiking
Flood Risk	No reduction	No reduction	1% reduction
Additional **Annual** Fee for Standard License Plate	$1 per vehicle	$1 per vehicle	$12 per vehicle

Which of the following options would you select?

Option 1

Option 2

Option 3

I would **not** select any of the options above to help finance land stewardship on private land

Please consider the following three options:

Characteristic	Option 1	Option 2	Option 3
Florida Panther	threatened 	threatened 	threatened 
Game Species	medium 	medium 	high 
Recreational Access	hiking	fishing	hunting
Flood Risk	2% reduction	No reduction	1% reduction
Additional **Annual** Fee for Standard License Plate	$4 per vehicle	$4 per vehicle	$1 per vehicle

Which of the following options would you select?

Option 1

Option 2

Option 3

I would **not** select any of the options above to help finance land stewardship on private land

Please consider the following three options:

Characteristic	Option 1	Option 2	Option 3
Florida Panther	endangered 	endangered 	endangered
Game Species	low 	low 	high 
Recreational Access	fishing	hunting	fishing
Flood Risk	1% reduction	2% reduction	2% reduction
Additional **Annual** Fee for Standard License Plate	$8 per vehicle	$12 per vehicle	$12 per vehicle

Which of the following options would you select?

Option 1

Option 2

Option 3

I would **not** select any of the options above to help finance land stewardship on private land

How confident are you that your choices reflect how you would vote tomorrow if you were asked to vote on this issue?

Not at all confident — Extremely confident

0 1 2 3 4 5 6 7 8 9 10

If you answered that you would **NOT** help finance land stewardship on private lands, please tell us why. *Check all applicable responses.*

I should not have to pay more taxes

I do not trust private landowners to maintain natural habitats for wildlife

It is not my responsibility to pay private landowners stewardship of natural lands

Protecting natural lands is not important to me

The costs to finance private landowner stewardship are too high

I am not planning to stay in Florida

I will not pay for a program that promotes hunting or fishing

[ ] Other:

Set 2

Please consider the following three options:

Characteristic	Option 1	Option 2	Option 3
Florida Panther	endangered 	threatened 	recovered 
Game Species	low 	medium 	high 
Recreational Access	fishing	fishing	hiking
Flood Risk	1% reduction	2% reduction	No reduction
Additional **Annual** Fee for Standard License Plate	$1 per vehicle	$12 per vehicle	$1 per vehicle

Which of the following options would you select?

Option 1

Option 2

Option 3

I would **not** select any of the options above to help finance land stewardship on private land

If you chose one of the options, you are paying an **additional yearly fee** for a Standard Florida license plate. The table below shows how the total amount you would pay changes if the additional fee was $1.

Number of Cars	Standard Fee	Additional Fee	Total per Year
1 car	$25	$1	$26 per year
2 cars	$50	$2	$52 per year
3 cars	$75	$3	$78 per year
4 cars	$100	$4	$104 per year

Do you wish to change your previous answer?

Yes

No

If you chose one of the options, you are paying an **additional yearly fee** for a Standard Florida license plate. The table below shows how the total amount you would pay changes if the additional fee was $12.

Number of Cars	Standard Fee	Additional Fee	Total per Year
1 car	$25	$12	$37 per year
2 cars	$50	$24	$74 per year
3 cars	$75	$36	$111 per year
4 cars	$100	$48	$148 per year

Do you wish to change your previous answer?

Yes

No

Please consider the following three options:

Characteristic	Option 1	Option 2	Option 3
Florida Panther	endangered 	threatened 	recovered 
Game Species	low 	medium 	high 
Recreational Access	fishing	fishing	hiking
Flood Risk	1% reduction	2% reduction	No reduction
Additional **Annual** Fee for Standard License Plate	$1 per vehicle	$12 per vehicle	$1 per vehicle

Which of the following options would you select?

Option 1

Option 2

Option 3

I would **not** select any of the options above to help finance land stewardship on private land

Please consider the following three options:

Characteristic	Option 1	Option 2	Option 3
Florida Panther	endangered	recovered 	threatened 
Game Species	medium 	medium 	low 
Recreational Access	fishing	fishing	hiking
Flood Risk	No reduction	2% reduction	No reduction
Additional **Annual** Fee for Standard License Plate	$8 per vehicle	$4 per vehicle	$1 per vehicle

Which of the following options would you select?

Option 1

Option 2

Option 3

I would **not** select any of the options above to help finance land stewardship on private land

Please consider the following three options:

Characteristic	Option 1	Option 2	Option 3
Florida Panther	endangered 	endangered 	threatened 
Game Species	low 	high 	high 
Recreational Access	hunting	hiking	hunting
Flood Risk	No reduction	2% reduction	1% reduction
Additional **Annual** Fee for Standard License Plate	$4 per vehicle	$8 per vehicle	$8 per vehicle

Which of the following options would you select?

Option 1

Option 2

Option 3

I would **not** select any of the options above to help finance land stewardship on private land

Please consider the following three options:

Characteristic	Option 1	Option 2	Option 3
Florida Panther	threatened 	recovered 	endangered 
Game Species	medium 	high 	low 
Recreational Access	hiking	hunting	hunting
Flood Risk	1% reduction	2% reduction	1% reduction
Additional **Annual** Fee for Standard License Plate	$12 per vehicle	$12 per vehicle	$4 per vehicle

Which of the following options would you select?

Option 1

Option 2

Option 3

I would **not** select any of the options above to help finance land stewardship on private land

How confident are you that your choices reflect how you would vote tomorrow if you were asked to vote on this issue?

Not at all confident										Extremely confident
0	1	2	3	4	5	6	7	8	9	10

If you answered that you would **NOT** help finance land stewardship on private lands, please tell us why. *Check all applicable responses.*

I should not have to pay more taxes

I do not trust private landowners to maintain natural habitats for wildlife

It is not my responsibility to pay private landowners stewardship of natural lands

Protecting natural lands is not important to me

The costs to finance private landowner stewardship are too high

I am not planning to stay in Florida

I will not pay for a program that promotes hunting or fishing

Other:

Set 3

Please consider the following three options:

Characteristic	Option 1	Option 2	Option 3
Florida Panther	endangered 	endangered 	endangered 
Game Species	medium 	medium 	high 
Recreational Access	hunting	hiking	hiking
Flood Risk	No reduction	2% reduction	No reduction
Additional **Annual** Fee for Standard License Plate	$4 per vehicle	$1 per vehicle	$12 per vehicle

Which of the following options would you select?

Option 1

Option 2

Option 3

I would **not** select any of the options above to help finance land stewardship on private land

If you chose one of the options, you are paying an **additional yearly fee** for a Standard Florida license plate. The table below shows how the total amount you would pay changes if the additional fee was $4.

Number of Cars	Standard Fee	Additional Fee	Total per Year
1 car	$25	$4	$29 per year
2 cars	$50	$8	$58 per year
3 cars	$75	$12	$87 per year
4 cars	$100	$16	$116 per year

Do you wish to change your previous answer?

Yes

No

If you chose one of the options, you are paying an **additional yearly fee** for a Standard Florida license plate. The table below shows how the total amount you would pay changes if the additional fee was $1.

Number of Cars	Standard Fee	Additional Fee	Total per Year
1 car	$25	$1	$26 per year
2 cars	$50	$2	$52 per year
3 cars	$75	$3	$78 per year
4 cars	$100	$4	$104 per year

Do you wish to change your previous answer?

Yes

No

If you chose one of the options, you are paying an **additional yearly fee** for a Standard Florida license plate. The table below shows how the total amount you would pay changes if the additional fee was $12.

Number of Cars	Standard Fee	Additional Fee	Total per Year
1 car	$25	$12	$37 per year
2 cars	$50	$24	$74 per year
3 cars	$75	$36	$111 per year
4 cars	$100	$48	$148 per year

Do you wish to change your previous answer?

Yes

No

Please consider the following three options:

Characteristic	Option 1	Option 2	Option 3
Florida Panther	endangered 	endangered 	endangered 
Game Species	medium 	medium 	high 
Recreational Access	hunting	hiking	hiking
Flood Risk	No reduction	2% reduction	No reduction
Additional **Annual** Fee for Standard License Plate	$4 per vehicle	$1 per vehicle	$12 per vehicle

Which of the following options would you select?

Option 1

Option 2

Option 3

I would **not** select any of the options above to help finance land stewardship on private land

Please consider the following three options:

Characteristic	Option 1	Option 2	Option 3
Florida Panther	recovered 	threatened 	threatened 
Game Species	high 	low 	high 
Recreational Access	fishing	hiking	fishing
Flood Risk	2% reduction	1% reduction	2% reduction
Additional **Annual** Fee for Standard License Plate	$1 per vehicle	$4 per vehicle	$1 per vehicle

Which of the following options would you select?

Option 1

Option 2

Option 3

I would **not** select any of the options above to help finance land stewardship on private land

Please consider the following three options:

Characteristic	Option 1	Option 2	Option 3
Florida Panther	recovered 	recovered 	endangered 
Game Species	medium 	low 	high 
Recreational Access	hiking	hunting	fishing
Flood Risk	No reduction	1% reduction	1% reduction
Additional **Annual** Fee for Standard License Plate	$8 per vehicle	$12 per vehicle	$4 per vehicle

Which of the following options would you select?

Option 1

Option 2

Option 3

I would **not** select any of the options above to help finance land stewardship on private land

Please consider the following three options:

Characteristic	Option 1	Option 2	Option 3
Florida Panther	threatened 	threatened 	recovered 
Game Species	low 	low 	medium 
Recreational Access	hunting	fishing	hunting
Flood Risk	2% reduction	No reduction	1% reduction
Additional **Annual** Fee for Standard License Plate	$8 per vehicle	$12 per vehicle	$8 per vehicle

Which of the following options would you select?

Option 1

Option 2

Option 3

I would **not** select any of the options above to help finance land stewardship on private land

How confident are you that your choices reflect how you would vote tomorrow if you were asked to vote on this issue?

Not at all confident										Extremely confident
0	1	2	3	4	5	6	7	8	9	10

If you answered that you would **NOT** help finance land stewardship on private lands, please tell us why. *Check all applicable responses.*

I should not have to pay more taxes

I do not trust private landowners to maintain natural habitats for wildlife

It is not my responsibility to pay private landowners stewardship of natural lands

Protecting natural lands is not important to me

The costs to finance private landowner stewardship are too high

I am not planning to stay in Florida

I will not pay for a program that promotes hunting or fishing

Other:

Set 4

Please consider the following three options:

Characteristic	Option 1	Option 2	Option 3
Florida Panther	threatened 	endangered 	recovered 
Game Species	high 	medium 	medium 
Recreational Access	hunting	hiking	hunting
Flood Risk	2% reduction	1% reduction	No reduction
Additional **Annual** Fee for Standard License Plate	$4 per vehicle	$1 per vehicle	$12 per vehicle

Which of the following options would you select?

Option 1

Option 2

Option 3

I would **not** select any of the options above to help finance land stewardship on private land

If you chose one of the options, you are paying an **additional yearly fee** for a Standard Florida license plate. The table below shows how the total amount you would pay changes if the additional fee was $4.

Number of Cars	Standard Fee	Additional Fee	Total per Year
1 car	$25	$4	$29 per year
2 cars	$50	$8	$58 per year
3 cars	$75	$12	$87 per year
4 cars	$100	$16	$116 per year

Do you wish to change your previous answer?

Yes

No

If you chose one of the options, you are paying an **additional yearly fee** for a Standard Florida license plate. The table below shows how the total amount you would pay changes if the additional fee was $1.

Number of Cars	Standard Fee	Additional Fee	Total per Year
1 car	$25	$1	$26 per year
2 cars	$50	$2	$52 per year
3 cars	$75	$3	$78 per year
4 cars	$100	$4	$104 per year

Do you wish to change your previous answer?

Yes

No

If you chose one of the options, you are paying an **additional yearly fee** for a Standard Florida license plate. The table below shows how the total amount you would pay changes if the additional fee was $12.

Number of Cars	Standard Fee	Additional Fee	Total per Year
1 car	$25	$12	$37 per year
2 cars	$50	$24	$74 per year
3 cars	$75	$36	$111 per year
4 cars	$100	$48	$148 per year

Do you wish to change your previous answer?

Yes

No

Please consider the following three options:

Characteristic	Option 1	Option 2	Option 3
Florida Panther	threatened 	endangered 	recovered 
Game Species	high 	medium 	medium 
Recreational Access	hunting	hiking	hunting
Flood Risk	2% reduction	1% reduction	No reduction
Additional **Annual** Fee for Standard License Plate	$4 per vehicle	$1 per vehicle	$12 per vehicle

Which of the following options would you select?

Option 1

Option 2

Option 3

I would **not** select any of the options above to help finance land stewardship on private land

Please consider the following three options:

Characteristic	Option 1	Option 2	Option 3
Florida Panther	recovered 	recovered 	endangered 
Game Species	high 	low 	high 
Recreational Access	fishing	fishing	hiking
Flood Risk	1% reduction	2% reduction	No reduction
Additional **Annual** Fee for Standard License Plate	$8 per vehicle	$8 per vehicle	$12 per vehicle

Which of the following options would you select?

Option 1

Option 2

Option 3

I would **not** select any of the options above to help finance land stewardship on private land

Please consider the following three options:

Characteristic	Option 1	Option 2	Option 3
Florida Panther	recovered 	threatened 	endangered 
Game Species	low 	medium 	medium 
Recreational Access	hiking	fishing	hunting
Flood Risk	2% reduction	1% reduction	1% reduction
Additional **Annual** Fee for Standard License Plate	$4 per vehicle	$12 per vehicle	$1 per vehicle

Which of the following options would you select?

Option 1

Option 2

Option 3

I would **not** select any of the options above to help finance land stewardship on private land

Please consider the following three options:

Characteristic	Option 1	Option 2	Option 3
Florida Panther	endangered 	threatened 	threatened 
Game Species	high 	low 	low 
Recreational Access	fishing	hiking	hunting
Flood Risk	No reduction	No reduction	2% reduction
Additional **Annual** Fee for Standard License Plate	$4 per vehicle	$8 per vehicle	$1 per vehicle

Which of the following options would you select?

Option 1

Option 2

Option 3

I would **not** select any of the options above to help finance land stewardship on private land

How confident are you that your choices reflect how you would vote tomorrow if you were asked to vote on this issue?

Not at all confident — Extremely confident

0 1 2 3 4 5 6 7 8 9 10

If you answered that you would **NOT** help finance land stewardship on private lands, please tell us why. *Check all applicable responses.*

I should not have to pay more taxes

I do not trust private landowners to maintain natural habitats for wildlife

It is not my responsibility to pay private landowners stewardship of natural lands

Protecting natural lands is not important to me

The costs to finance private landowner stewardship are too high

I am not planning to stay in Florida

I will not pay for a program that promotes hunting or fishing

Other:

Specialty License Plate

Do you have a Specialty License Plate?

Yes

No

Which one do you have?

Conserve Wildlife

Save the Manatee

Protect the Panther

Helping Sea Turtles Survive

Protecting Wild Dolphins

Fish Florida

Protect Florida Whales

Wildlife Foundation of Florida

Go Fishing

Save Wild Florida

I have a different Specialty Florida License Plate

No, I do not have a Specialty Florida License Plate

Wildlife Value Orientations

How much do you **agree or disagree** with the following statements?

	Strongly **disagree**	Disagree	Neither agree nor disagree	Agree	Strongly **agree**
Humans should manage wild animal populations so that humans benefit.	○	○	○	○	○
We should strive for a world where there's an abundance of fish and wildlife for hunting and fishing	○	○	○	○	○
I care about animals as much as I do other people	○	○	○	○	○
Animals should have rights similar to the rights of humans	○	○	○	○	○
Wildlife are like my family and I want to protect them	○	○	○	○	○

How much do you **agree or disagree** with the following statements?

	Strongly **disagree**	**Disagree**	Neither agree nor disagree	**Agree**	Strongly **agree**
Hunting is cruel and inhumane to animals	○	○	○	○	○
The needs of humans should take priority over fish and wildlife protection	○	○	○	○	○
I feel a strong emotional bond with animals	○	○	○	○	○
If you are reading this, check "disagree"	○	○	○	○	○
We should strive for a world where humans and wildlife and fish can live side by side without fear	○	○	○	○	○

How much do you **agree or disagree** with the following statements?

	Strongly **disagree**	**Disagree**	Neither agree nor disagree	**Agree**	Strongly **agree**
I value the sense of a companionship I receive from animals	○	○	○	○	○
Fish and wildlife are on earth primarily for people to use	○	○	○	○	○
Hunting does not respect the lives of animals	○	○	○	○	○
I view all living things as part of one big family	○	○	○	○	○
People who want to hunt should be provided the opportunity to do so	○	○	○	○	○

End

If you have any additional comments or suggestions that you would like to share, please write them below.

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