

DISSERTATION

WILDLIFE VALUE ORIENTATIONS AMONG DIVERSE AUDIENCES IN THE  
AMERICAN SOUTHWEST: HELPING STATE WILDLIFE AGENCIES BROADEN THEIR  
CONSTITUENT BASE

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## ABSTRACT

### WILDLIFE VALUE ORIENTATIONS AMONG DIVERSE AUDIENCES IN THE AMERICAN SOUTHWEST: HELPING STATE WILDLIFE AGENCIES BROADEN THEIR CONSTITUENT BASE

There is growing recognition among wildlife professionals in the United States that although their decisions largely focus on topics biological in nature, the social, political, and economic ramifications of these decisions are considerable as well. As a result, social science is increasingly being included in the wildlife management decision-making process. At the same time, the constituencies that entrust state wildlife management agencies are diversifying, in terms of both their cultural heritage and their wildlife-related interests. To improve the effectiveness of agency efforts aimed at maintaining support from long-established stakeholders while simultaneously embracing emerging publics, there is a need to better understand the characteristics of diverse audiences. Wildlife value orientation (WVOs) theory offers an advantageous framework for systematically understanding the wildlife-related beliefs and interests of various segments of society.

This dissertation investigates WVOs and their application across three diverse spectra: culture, methodology, and generations, each addressed in its own manuscript and through research conducted as part of a series of case studies occurring in Arizona. In Chapter II, WVOs are compared across cultures; specifically, this chapter explores possible differences and similarities in WVOs between Latinos and Caucasians. In addition to measuring WVOs, this study collected information about life values, wildlife-related attitudes, subjective norms, and behavioral intentions. Results indicated that Latinos perceive wildlife differently than Caucasians; however there was significant heterogeneity within Latino communities in the way

they interacted with and related to wildlife. These findings provide managerial insight into engaging Latino communities in wildlife conservation issues as well as offer theoretical contributions by expanding the application of the WVO concept cross-culturally.

In Chapter III, we introduce and test a mixed methods approach for measuring WVOs within Latino communities. As agencies are increasingly charged with managing wildlife for a broader clientele, including people of diverse demographic and cultural backgrounds, it raises questions about the potential limitations of traditional survey methodologies for cross-cultural WVO assessment. In the interest of addressing this concern we examined WVOs in Latino communities in Arizona using two quantitative and two qualitative methodologies. We found evidence that traditional quantitative WVO surveys may still be reliable for diverse audiences; however, we also identify scenarios wherein other methodologies may be advantageous.

In Chapter IV, WVOs are compared across generations. As various cohorts of people across time experience different societal conditions believed to play a role in WVO formation, they can be grouped according to similar formative experiences. These generations experience various levels of urbanization, affluence, education, and technology, all contributing to distinctive life values. Concurrent with modernization is a value shift that is altering the way people perceive and interact with wildlife, specifically increasing the egalitarian perception that wildlife may serve as potential companions capable of trusting relationships with humans and who deserve caring and rights similar to those of humans. We confirmed there is a differential in the way generations perceive wildlife, suggesting agencies may want to consider engaging each cohort differently, according to how they relate to wildlife. These findings may assist agencies as they continue to engage broader constituencies and attempt to remain salient to younger generations.

Overall, we found WVO theory to be a functional and robust framework for examining people's perceptions of wildlife across cultures, methodologies, and generations. Because of its durability, WVO theory shows promise for unifying research on human-wildlife relationships in a way that transcends space, time, and contextual situations. Additionally, WVOs have the practical utility of helping agencies understand the social context of wildlife conservation, and may assist agencies in comprehending changing societal conditions so they may be better prepared for the future of wildlife conservation.

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## I. INTRODUCTION TO THE DISSERTATION

The ability of state wildlife agencies (agencies) to adequately represent today's public interests is being tested by a recent societal shift in the way people perceive and interact with wildlife. In the past, agencies have worked to conserve hunted and non-hunted wildlife species; using revenues generated largely from the sale of hunting and fishing licenses as well revenues from the Pittman-Robertson (The Federal Aid in Wildlife Restoration of 1937) and Dingell-Johnson (Federal Aid in Sport Fish Restoration Act of 1950) taxes on hunting and fishing equipment. However, in recent decades, there has been a significant decline in hunting, fishing, and other consumptive forms of wildlife-related recreation (U.S. Fish & Wildlife Service, 2007; Chase, 2010), which has led to concerns about the ability of the agencies to secure stable sources of funding to support wildlife conservation in the future. At the same time, there has been tremendous growth in interest and participation in other forms of wildlife-related recreation, such as wildlife viewing (U.S. Fish & Wildlife Service, 2007; Chase, 2010). Although valuable, these activities generate little immediate revenue for agencies and may strain already-constricted budgets. Tied to these trends is the changing nature of public interests that demand a say in how wildlife are managed and that correspond to different preferences for wildlife-related programs and services (Manfredo, Teel, & Henry, 2009; Teel & Manfredo, 2009). Greater diversity in viewpoints has contributed to increased interpersonal conflict, as well as social values conflict among stakeholders (Madden, 2004). Furthermore, agencies acting as stewards of public resources are having difficulty adequately representing the divergent interests of stakeholders and have increasingly endured challenges to their authority through mechanisms such as ballot initiatives and public referenda (Minnis, 1998).



Adding to the challenges associated with the changing nature of public interests regarding wildlife are demographic changes that have led to greater ethnic diversity (Schuett, Scott, & O'Leary, 2009; Cordell, Bergstrom, Betz, & Green, 2004) and a more urbanized society (U.S. Census Bureau, 2010). Historically, agencies have been slow to respond to diverse ethnic groups (Allison & Hibbler, 2004) which tend to be underrepresented in outdoor activities (Solop, Hagen, & Ostergren, 2003) including wildlife-related recreation pursuits (U.S. Fish & Wildlife Service, 2007). Given the growing political and economic influence of ethnicities (Lopez, Lopez, Wilkins, Torres, Valdez, Teer, et al., 2005), continued marginalization of these groups in concert with urbanites who are increasingly segregated from nature, could lead to reduced political capital for agencies. Conservation of wildlife is best accomplished if it is relevant to a broad constituency (Jacobson, Organ, Decker, Batcheller, & Carpenter, 2010); therefore, in the face of changing societal conditions, the long-term success of agencies is contingent upon their ability to reach and provide services for audiences that are diverse, both in terms of their cultural heritage as well as their wildlife-related interests.

In response to these trends, and in an effort to stay relevant, agencies are attempting to diversify to a system that is germane to a wider constituency, while simultaneously exploring ways to bolster their traditional hunter/angler-based business model. To become salient to a broader audience not interested in hunting or fishing, agencies have tried to offer new agency programs and services (e.g., wildlife viewing opportunities) designed to appeal to emerging interests whose values may not be reflected in wildlife related activities conventionally promoted by agencies. Although the intention of these additional programs is to generate a new clientele that could serve as an added support base for future agency activities, these new constituents may bring opinions that differ from those of traditional agency patrons and agency staff, many of

whom have, by convention, grown up hunting and fishing (Organ & Frizell, 2000). The long-term success of these efforts is no doubt challenged by a number of factors including the lack of stable funding mechanisms as well as reluctance to embrace change given the historical dependence of the agencies upon hunting and fishing for revenue as well as the agency culture that has formed around these traditions (Gill, 1996; Organ & Frizell, 2000). For these reasons, agencies have also focused their attention on strengthening traditional constituencies through hunter/angler recruitment and retention initiatives; however, the overall efficacy of these programs is largely unknown, as documented evidence evaluating the lasting effects of these initiatives is lacking.

To improve the effectiveness of these agency efforts aimed at maintaining support from long-established stakeholders and embracing emerging publics, there is a need to better understand the characteristics of diverse audiences including their wildlife-related interests. Recent human dimensions research on wildlife value orientations (WVOs) in the United States (Manfredo & Teel, 2008; Manfredo, Teel, & Henry, 2009; Teel & Manfredo, 2009; McCoy, 2010) and globally (Teel, Manfredo, Jensen, Buijs, Fischer, & Riepe, et al., 2010, Teel, Manfredo, & Stinchfield, 2007; also see *Human Dimensions of Wildlife* volume 12, issue 5) offers a conceptual framework for exploring these interests and monitoring how they may be changing over time as a result of broad societal forces. Building on this research tradition, this dissertation explores WVOs in several novel contexts, with the purpose of expanding upon its theoretical applicability as well as generalizing its managerial implications. Armed with a deeper understanding of diverse segments of the public, defined both in terms of their cultural heritage as well as their wildlife-related interests, agencies will be better prepared to identify ways to reach out to underserved audiences and continue to maintain relevancy in a changing society.

## Dissertation Organization and Purpose

Building upon these research traditions, the primary purpose of this dissertation is to investigate WVOs and their application across three different spectra: culture, methodology, and generations. This investigation will contribute to advancements in the application of the WVO concept by facilitating an exploration of its validity in a previously understudied population as well as by comparing and contrasting novel groups of individuals. An examination of WVOs across diverse ethnic groups can advance knowledge of cross-cultural differences in WVOs, as well as factors that may affect WVO shift (Teel, Manfredo, & Stinchfield, 2007). This cross-cultural understanding comes through understanding of the Macro (Modernization Theory) and Micro (Cognitive Hierarchy Theory of Human Behavior) portions of the model (Manfredo & Dayer, 2004; Manfredo & Teel, 2008) within an additional culture. Additionally, this dissertation has the more practical purpose of providing agencies with information useful in exploring ways to more adequately represent and garner support from underserved publics.

This dissertation is organized around three primary objectives, each addressed in its own manuscript. The first manuscript explores possible differences and similarities in WVOs between Latinos<sup>1</sup> and Caucasians, using data previously collected from a survey of Arizonan residents, and considers the implications of this for understanding agency audiences. In addition to measuring WVOs, this study collected information about other types of cognitions including attitudes toward wildlife-related issues among Latinos. The relationship demonstrated between WVOs and attitudes provides additional evidence for the predictive validity of the WVO concept.

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<sup>1</sup> As with any paper addressing ethnicity, terminology can be an issue. The term Latino is an abstraction of *Latino-Americano*, a demonym signifying a person of Spanish-Hispanic origin if the person's origin is Mexican, Mexican-American, Chicano, Puerto Rican, Dominican, Ecuadorian, Guatemalan, Honduran, Nicaraguan, Peruvian, Salvadorian, or other Spanish-speaking countries of the Caribbean, Central America, South America, or of Spain (Oboler, 1998). Occasionally, this term is used synonymously with Hispanic. Caucasian is a shortened version of Caucasian American, White American, or White. The term signifies a person having origins from Europe (e.g., Bonnett, 2007; Hartmann, Gerteis, & Croll, 2009). The author acknowledges the heterogeneity of each group and the richness of each ethnicity, but to adequately address it is outside the scope of this work.

The second manuscript introduces and tests a mixed-methods approach, consisting of quantitative and qualitative procedures, for measuring WVOs within Latino populations. Results of this approach in Arizona were used to evaluate the methodology (including its different components) for future use, as well as to validate findings reported in the first manuscript. The third manuscript quantitatively explores the variation in WVOs across generations using data from a series of surveys conducted with Arizona residents. The relationship found between WVOs and birth year offers additional insight into the factors that may be affecting change in public thought regarding wildlife over time in the U.S. as well as points to important needs for future research in this area.

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## II. WILDLIFE VALUE ORIENTATIONS AMONG LATINOS: MANAGERIAL AND THEORETICAL IMPLICATIONS FOR ENGAGING DIVERSE AUDIENCES

### **Executive Summary**

State wildlife agencies developed when hunting and fishing opportunities were plentiful and participation was generally socially acceptable. A recent societal shift is causing reduced participation in hunting and fishing, diminished wildlife conservation revenues, and shrinking political support, resulting in an uncertain future for agencies. One way for agencies to ensure their future is to reach out to constituencies traditionally underserved. The Latino communities are one such constituency, and wildlife value orientations (WVOs) are an advantageous framework for understanding the wildlife-related interests of this previously understudied constituency. To explore the distinctiveness and the breadth of variation within Latino communities, we compared the WVOs of Latinos and Caucasians residing in the American Southwest. We found that Latinos tend to be more mutualistic (view of wildlife as capable of relationships of trust with humans and defined by a desire for companionship with wildlife) and less domination (view of wildlife that prioritizes human wellbeing over wildlife and treats wildlife in utilitarian terms) oriented than Caucasians in their WVOs. However, through cluster analysis, discrete groups of Latinos emerged indicating Latinos cannot be considered as a monolithic ethnicity. Less acculturated Latinos were found to be more mutualistic and less domination oriented, while more acculturated Latinos were more comparable to their Caucasian counterparts. These findings provide managerial insight into engaging Latino communities in wildlife management as well as offer theoretical contributions by expanding the application of the WVO concept cross-culturally.

## Introduction

State wildlife agencies (agencies) and the science of wildlife management evolved during a time when idyllic conditions existed to create a codependency between agencies and consumptive wildlife recreation interests (Organ & Fritzell, 2000). Most agencies formed in the early and mid-1900s; a time when a higher percentage of the populace was connected directly to the land through agriculture and there was a general acceptance of hunting and fishing. As a result, agencies have a strong hunting and angling subculture (Organ & Fritzell, 2000). With the advent of the Pittman-Robertson Federal Aid in Wildlife Restoration Act of 1937 and the subsequent Dingell-Johnson Act, the mutual reliance between consumptive users and agencies was extended to fiscal matters as well. Historically, this partnership of hunters, anglers, and agencies has greatly benefited wildlife conservation; a standard many other countries have tried to emulate. The success of the North American Model of Wildlife Conservation<sup>2</sup> (Geist, Mahoney & Organ, 2001) that evolved from this tradition is evidenced by the rebound and recovery of many wildlife populations, bolstered by increasing wildlife conservation dollars. With this funding, agencies expanded their projects, workforce, and political influence.

However, today presents different conditions than the halcyon days of the past, and agencies may not have made corresponding changes to adapt (Gill, 1996). The forces of modernization have changed societal conditions such that life experiences are dramatically different from years past. Urbanization, for example, has resulted in less of the public directly connected to the land (Louv, 2005). Increasing education (U.S. Census Bureau, 2009), growing affluence (U.S. Census Bureau, 2009), and a diffusion of affordable technology (Louv, 2005)

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<sup>2</sup> The North American Model refers to the historic foundations of wildlife conservation within the United States. There is generally consensus that its tenets are: that wildlife is collectively owned by the citizens, private markets that intensify harvests should not exist, opportunities to enjoy wildlife should be equitable, and management decisions should be based on sound science (Prukop & Regan, 2005).



have all contributed to an increasingly modern society that is progressively more detached from nature and may view natural resources differently. These societal forces have led to the emergence of new agency constituencies who view nature as something vulnerable in need of protection, deviating from the views of previous generations that tended to perceive nature as something to be conquered or tamed. Concurrent with these trends are dwindling support and participation in hunting and fishing and other forms of consumptive wildlife recreation (Chase, 2010; US Fish and Wildlife Service, 2007). Because hunters and anglers are the main source of income for state agencies, this shrinking customer base, in concert with increased operation costs, has eroded agency budgets, threatening the traditional means of wildlife conservation.

Agencies may be able to mitigate the negative effects of these societal changes by broadening their political and monetary support. The latent demand for wildlife-related services that potentially exists within wider audiences may serve as a fountain of new supporters, the influx of which could infuse agencies with needed funding, political support, and enthusiasm for agency goals (Jacobson, Organ, Decker, Batcheller, & Carpenter, 2010). By augmenting their traditional supporters with new citizenry, agencies will increase their organizational resilience and reduce the risk of becoming politically marginalized (Berkes & Turner, 2006). However, as agencies broaden their client base and more people demand a say in the way their wildlife is managed, conserving wildlife in the public trust<sup>3</sup> will become increasingly more complex.

Broadening agency constituencies demands an ability to engage diverse audiences in such a way that agency activities and messaging will resonate with them. Within this context, diverse audiences are conventionally delineated to include emerging publics with increasingly

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<sup>3</sup> A primary tenet of the North American Model is the Public Trust Doctrine which establishes that all natural resources universally belong to all people of the nation in which the resources are found, and that all citizens have equal access to those resources (The Wildlife Society, 2010). In the United States, the majority share of this mandate is largely relegated to state wildlife agencies. Therefore, each state shares the responsibility of managing wildlife according to the collective will of its citizenry.

broadening wildlife-related interests as well as traditional supporters. The need to understand the wildlife-related interests and ideals of these different groups is an important first step in the public engagement process and stakeholder diversification. Cognizant of this goal, the intention of this investigation was to improve comprehension regarding the manner in which Latino communities of the American Southwest (specifically in Arizona) relate to wildlife, particularly given that they may have been traditionally underserved by state wildlife agencies. Wildlife value orientation (WVO) theory is one mechanism to facilitate understanding of diverse audiences, both in terms of their background as well as their wildlife-related interests.

## **Conceptual Background**

### **Wildlife Value Orientations**

Wildlife value orientation theory has been an approach used to understand the diversity of public interests regarding wildlife (Manfredo, Teel, & Henry, 2009; Teel & Manfredo, 2009). This theory is based on the value-attitude-behavior model (Homer & Kahle, 1988) in which individual behavior is guided by a series of interrelated cognitions arranged in a hierarchical fashion. At the base of this hierarchy are values, which are broad, enduring beliefs (Rokeach & Ball-Rokeach, 1989). These values influence the formation of attitudes, which are defined as the association of an evaluation and an object (e.g., an issue, an entity, another person, a behavior) in memory (Ajzen & Fishbein, 1980). Attitudes by their nature are more malleable than values and act as the immediate antecedent to an individual's behavior. Values are held in common by individuals of a given culture (Inglehart & Welzel, 2005), rendering them largely ineffectual for explaining variation in individual attitudes and subsequent behaviors *within* cultures (Bright, Manfredo & Fulton, 2000). Value orientations, which more readily capture this variation, are defined as “networks of basic beliefs that organize around values and provide contextual

meaning to those values in relation to a particular domain such as wildlife” (Teel & Manfredo, 2009, p. 129). Specifically, wildlife value orientations (WVOs) are reflective of cultural ideologies that play an important role in shaping individuals’ wildlife-related behaviors and attitudes toward issues dealing with wildlife treatment (Manfredo et al., 2009).

Past research in the United States has empirically documented two primary WVOs representing how different people relate to wildlife, a domination orientation and a mutualism orientation (Manfredo et al., 2009; Teel & Manfredo, 2009). Individuals with a domination orientation believe the needs of humans supersede those of wildlife and perceive wildlife as a resource to be managed for the benefit of humans. They generally hold attitudes more favorable to actions involving utilitarian treatment of wildlife (e.g., hunting, lethal control) and are more likely to exhibit behaviors such as hunting and fishing. Individuals with a mutualism orientation believe wildlife are deserving of caring and rights similar to humans and view wildlife as potential companions capable of relationships of trust. They are less likely to support actions resulting in death or harm to wildlife and more likely to engage in behaviors such as wildlife viewing and feeding.

Findings from a recent 19-state investigation conducted in the western United States provides evidence suggestive of a societal shift away from emphasis on a domination orientation toward wildlife (Manfredo et al., 2009). This shift in WVOs, which is believed to be at the root of declines in hunting and public acceptance of certain traditional forms of wildlife management (e.g., lethal control), is thought to be associated with a broader values shift that can be attributed to forces of modernization, including urbanization and improved economic well-being (Inglehart, 1997; Inglehart & Welzel, 2005). Because some of the same forces of modernization contributing to these shifts in values have been shown to impact the composition and distribution

of WVOs in the United States, there is also some degree of predictability in the shift away from domination and toward a mutualism view of wildlife at the societal level (Manfredo et al., 2009). As the U.S. continues to become more modernized and demographically diverse, leading to such changes in the public's wildlife-related interests, it is critical that agencies understand the characteristics of emerging segments of the population, including their WVOs, which define the nature of their relationship with wildlife.

### **Understanding WVOs among Diverse Audiences**

Exploring WVOs cross-culturally can improve understanding of diverse audiences. WVOs have been qualitatively investigated across different cultures through exploratory studies employed in various countries, including the Netherlands, China, Estonia, Mongolia, and Thailand as part of the Wildlife Values Globally Research Program (see *Human Dimensions of Wildlife*, volume 12, issue 5). WVOs have also been examined cross-culturally through an exploratory quantitative study in 10 European countries (Teel et al., 2010). Yet, despite these efforts, there is a need for additional research to enhance understanding of the cultural influences that can impact WVOs, as well as to explore how WVOs may vary across subcultures (e.g., different ethnicities or ancestries) that exist within nations. There is a strong utility in simultaneously investigating culture and WVOs as the United States becomes more diverse, and those of different backgrounds (both in terms of cultural heritage and in wildlife-related experiences) are juxtaposed upon a landscape that increasingly sprawls into natural habitats.

Different lines of research may potentially serve as frameworks for further exploration of WVOs across cultures. These frameworks predict cross-cultural differences in life values which in turn would have implications for differences in how people think about and relate to their natural environment and wildlife. Although certainly not exhaustive of the life values literature,

the frameworks most germane to the investigation of WVOs include modernization theory and cross-cultural value orientations. An underlying commonality for these frameworks is Maslow's hierarchy of needs (1943), which broadly suggests that individuals evaluate their natural surroundings according to the needs the natural world fulfills for them. For individuals trying to meet lower order needs, nature will be valued for the basic physiological needs that it provides in the form of food, shelter, and hydration. Conversely, for those oriented towards higher-order needs, nature will be valued for its ability to provide experiences contributing to improved quality of life, self-esteem and self-actualization. Because of shared backgrounds, cultural norms, and life values, people should interact with their natural surroundings more similarly to compatriots of the shared culture than to individuals originating from other cultures. These common theoretical underpinnings of each framework provide continuity while studying WVOs across cultures.

### *Modernization Theory*

Modernization Theory describes the process by which a society's life values evolve over time. The theory asserts that a person's life values are defined by the lifestyle circumstances or conditions of one's upbringing (Inglehart, 1997). Further, Inglehart (1997) contends that life values are contingent upon the needs (Maslow, 1943) the individual is trying to meet during his/her formative years. Therefore, individuals who grow up trying to satisfy basic physiological needs are likely to have *materialist* life values exhibited later in life, wherein ensuring social and economic security, maintaining order, and respecting authority are esteemed. Conversely, individuals pursuing higher-order needs such as self-esteem and self-actualization during their formative years are likely to have *postmaterialist* values, wherein protecting individuals'

freedoms, ensuring humanity and aesthetics, and governing in a participatory manner are desirable characteristics of society.

Inglehart's theory of modernization (1997) has implications for examining values cross-culturally. Specifically, according to this theory, individuals who have reached adulthood in developing countries are likely to have more materialist values; conversely, individuals who have matured in a developed country are likely to have more postmaterialist values (Inglehart & Welzel, 2005). An illustration of this pattern can be found in a comparison of the life values between the United States and Mexico within the World Values Survey (2000 wave). As Inglehart would predict, the developed U.S. tends to have a higher proportion of people with postmaterialist values than does Mexico<sup>4</sup>, a less developed country (World Values Survey, 2011). In his early work, Inglehart (1997) contended the rise in environmentalism<sup>5</sup> was directly tied to a societal shift toward emphasis on postmaterialist values in post-industrialized nations. However, his ideas were influenced by Dunlap and colleagues (1993; 2006; see also Dunlap & Mertig, 1995) and Dietz and Rosa (2002), among others, who cited the rise of environmental concern observed in some developing nations as a counterargument to Inglehart's theory. Following these critiques, Inglehart (1995, 2008) maintained the rise in environmentalism in affluent societies was largely due to a focus on preservation of quality of life (a higher-order concern tied to postmaterialist life values); while the rise in environmentalism seen in impoverished nations was attributable to dependence upon the environment for subsistence living and a degraded

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<sup>4</sup> Although there is heterogeneity of national heritage within Latinos, over 90% of Latinos living within Arizona claim Mexican heritage (U.S. Census Bureau, 2010). For this reason, we used Mexico as a comparative baseline.

<sup>5</sup> Inglehart (1997) defined environmentalism as emphasizing environmental protection over other more materialist concerns such as economic growth. Precepts of environmentalism are somewhat comparable to the mutualism WVO, wherein wildlife is deserving of caring and protection, and the concept also parallels tenets of postmaterialism. The strong relationship found among postmaterialist life values, mutualism WVOs and environmentalism (Manfredo et al., 2009; Teel et al., 2005) make Inglehart's work particularly salient to the study of WVOs.

ecosystem would no longer meet basic physiological needs (a trait reflective of materialist values).

Inglehart's theory has implications for this study because the underlying forces that beget postmaterialist life values are also thought to produce the broad societal shift away from domination toward more mutualism WVOs in countries like the United States. Given the theoretical connection of life values and WVO constructs and the empirically-demonstrated link between materialist/postmaterialist values and WVOs (Manfredo et al., 2009), one would predict a concurrence of materialist values and domination WVOs to be more prevalent in developing countries. Further, because values and WVOs are relatively stable across time (Rokeach & Ball-Rokeach, 1989; Manfredo et al., 2009), Modernization Theory predicts that recently-arrived Latinos would be more domination-oriented in their views of wildlife than their Caucasian neighbors, whereas Latinos who are highly acculturated<sup>6</sup> would be more similar to Caucasians in their WVOs (see Dayer, Stinchfield, & Manfredo, 2007).

### *Cross-Cultural Value Orientations*

Schwartz (2006) studied values cross-culturally in 73 countries, finding most societies can be described using seven cultural value orientations, organized into what he terms 'cultural value dimensions.' Specifically, Schwartz's *embeddedness vs. autonomy* value dimension addresses the way a person perceives his/her part in society. A society high on embeddedness sees the individual as a component of a larger collective, whereas a society high on autonomy views individuals as a whole unto themselves, free to express their individual uniqueness. Schwartz's second value dimension *hierarchy vs. egalitarianism* is concerned with the way that

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<sup>6</sup> Throughout this manuscript, the term acculturation is used to signify acculturation from the cultures of Latin America toward the prevailing culture of the Southwestern United States, and specifically to that of Arizona. This direction of valence does not imply the preference for one culture over another; rather, it is simply a description of the process specific to this research study and an attempt to avoid redundancy.

order is maintained in society. A society high on hierarchy derives order from structure and differing levels of power, while an egalitarian society views all individuals as equals acting with moral intentions for society's common good. Finally, the *mastery vs. harmony* value dimension defines the way that individuals interact with the social and natural environment that surrounds them. A mastery society views individuals as capable of directing the social and natural environment by asserting the person's will upon it. Conversely, a harmony society views individuals as part of the natural and social system, accepting their role inside it without trying to alter it to their needs.

Recent conceptualizations of the WVO construct have built upon Schwartz's ideas in that the domination WVO is believed to be reflective of the mastery value orientation, whereas the mutualism WVO is more reflective of an egalitarian orientation (Manfredo et al., 2009). Schwartz's (2006) cross-cultural values research indicates that mastery is a predominant orientation of the U.S., while Mexico places greater emphasis on the egalitarianism and harmony orientations. Consequently, this research suggests that Caucasians would be more domination oriented and Latinos would be more mutualistic in their views of wildlife. An additional consequence is that as Latinos acculturate to the U.S. they may become more representative of the domination WVO prevalent in the U.S., while less acculturated Latinos may be more mutualistic.

In summary, the life values frameworks discussed above have important linkages to WVO theory and provide insight useful for exploring WVOs cross-culturally. Because life values are established at a young age, are culturally-derived, and are highly resistant to change (Rokeach & Ball-Rokeach, 1989, Schwartz, 1992; Inglehart & Baker, 2000), adult individuals who relocate to countries of dissimilar development are not predicted to change their values as a



result of a new residence. However, the life values of their children may be impacted by the new set of life circumstances affecting their upbringing. Similarly, because WVOs are formed early on in life and are derived from the same set of conditions affecting broader life values (Manfredo et al., 2009); they are believed to remain stable within adult individuals across time and contexts. Therefore, as individuals from developing countries relocate to developed countries, we would expect their WVOs to more closely resemble the WVOs of their native country rather than those of their destination country. This prediction would be especially true for recently-relocated individuals who are less acculturated to the destination country; however, the disparity in WVOs may diminish the longer families reside in the destination country, and newer generations' WVOs may become more reflective of those of the destination country. It is important to note that the predictions of Inglehart's Modernization Theory and Schwartz's cross-cultural value orientations discussed above offer contrasting conclusions for WVO research (Inglehart's theory indicates Latinos may be more domination-oriented and less mutualistic; while Schwartz's work suggests the converse). Given this ambiguity, as well as the inextricable connection of cultural heritage, life values, and WVOs, examining WVOs cross-culturally is important both to understanding how Latinos interact with wildlife as well as to advancing the cross-cultural application of WVO theory.

### **Study Purpose**

This investigation aimed to utilize the aforementioned theoretical frameworks to advance WVO theory while simultaneously augmenting agency understanding by examining the relationship between ethnicity and how diverse audiences relate to wildlife as measured by WVOs. A case study of Latino and Caucasian communities in Arizona was used to explore this relationship. We would expect that as Latinos from developing countries relocate to Arizona

their WVOs would remain relatively static at the individual level. Therefore, we hypothesized that, as a whole, Latinos in Arizona will have different WVOs than Caucasians. Because Inglehart's (1997) Modernization Theory suggests that Latinos would generally be more domination oriented and Schwartz's (2006) cross-cultural value orientations research would predict that Latinos would be more mutualistic, our hypothesis that Latinos and Caucasians diverge in their WVOs was non-directional ( $H_1: WVOs_{\text{Latinos}} \neq WVOs_{\text{Caucasians}}$ ).

As cultural heritage is the basis for our expectation of differing WVOs between Latinos and Caucasians, we anticipated acculturation to be tied to variation in WVOs within Latino communities. Therefore, a second objective of our research was to explore potential differences in WVOs among Latinos with different levels of acculturation. We hypothesized that Latinos who are more acculturated may have WVOs more similar to those of Caucasians, whereas less acculturated individuals may have WVOs that diverge more strongly from their Caucasian counterparts ( $H_2: WVOs_{\text{High acculturated Latinos}} \approx WVOs_{\text{Caucasians}}$ ;  $H_3: WVOs_{\text{High acculturated Latinos}} \neq WVOs_{\text{Low acculturated Latinos}}$ ; see Shaul & Gramann, 1998).

A tertiary research objective was to determine how other levels of cognition correlate with WVOs within the Latino community. Specifically, we examined the link between WVOs and measures of life values, attitudes toward wildlife management actions, and attitudes, norms, and behavioral intentions regarding hunting and fishing ( $H_4: \text{life values and } WVOs_{\text{correlation}} > 0$ ;  $H_5: \text{wildlife-related attitudes and } WVOs_{\text{correlation}} > 0$ ;  $H_6: \text{behavioral intentions and } WVOs_{\text{correlation}} > 0$ ;  $H_7: \text{subjective norms and } WVOs_{\text{correlation}} > 0$ ). Evidence of relationships among these concepts would provide additional information about Latino responses to wildlife-related issues for management decisions, but would also help demonstrate the predictive validity of the WVO concept in a new cultural context.

## **Methods**

### **Study Area**

Arizona is an ideal study area for examining Latino communities and their WVOs and subsequently comparing them to their Caucasian counterparts. Arizona is approximately one-third Latino, nearly twice the national average, and this statistic continues to rise (U.S. Census Bureau, 2009). Furthermore, Arizona has recently undergone rapid urbanization (Jenerette & Wu, 2001), and urban sprawl has led to an acceleration of human-wildlife conflict as well as increased strife among people with differing views regarding how wildlife should be managed. As other states are expected to undergo similar demographic changes to those already seen in Arizona, this study may provide insight into how other agencies may prepare for future changes affecting wildlife conservation.

### **Sampling and Data Collection**

Data for this study were collected in two survey efforts. The first survey was conducted by phone in November and December of 2010 and was part of a larger wildlife attitudes study of the general population of Arizonans. This survey was pretested with approximately 30 people, and the instrument was refined accordingly. Random-digit dialing was used to obtain a representative sample of Arizona adults stratified by age, gender, and geography of Arizona (63% Maricopa County, 17% Pinal County, 5% northern rural counties, 16% southern rural counties). Each potential respondent received at least six call-back attempts made at various times and days in an effort to reduce non-response bias ( $n=1,165$ ; response rate=36%). The second survey was conducted by phone five months later but only sampled adult Latinos in Arizona. This survey was also pretested with 35 people, although the instrument did not require refinement. The sample of Latinos was obtained using a Spanish surname sample, with at least

six call-back attempts to reduce non-response bias. The Latino sample was stratified by age, gender, and geography of Arizona, similar to the first study ( $n=1,230$ ; response rate=19%). Although these efforts had distinctive goals, some questions were common to both surveys and were asked in identical ways, particularly the items used to assess demographic characteristics and WVOs. The second survey had additional measures to assess values, attitudes, norms, and behavioral intentions, which allowed for a more in-depth examination of the relationship between WVOs and these other types of cognitions among Latinos. Because of the congruity and rigorous nature of the two survey efforts, the datasets of each were merged prior to analysis and hereafter referred to as 'survey' to connote both data collection efforts)

Because a non-response check was not feasible for this study, sample demographics, weighted by ethnicity to account for the overrepresentation of Latinos, were compared to information reported by the U.S. Census Bureau (2010). Study statistics did not differ significantly from population parameters on the variables of gender, household size, age, or geographic location. Additionally, Spanish-only speakers occurred in the sample in the same relative proportion as that of the population (5.3% of the sample was Spanish-only speaking versus 5.1% indicated by the 2010 census). There was a statistical difference between the population and the sample in regards to education level (86% of the population obtained at least high school diploma versus 91% in the sample; 61% of the population had attended or completed college versus 62% of the sample); however, this difference did not justify any further weighting (Cohen, 1992).

Due to obstacles associated with traditional survey methodologies when garnering information from diverse audiences (Bruyere, Teel, & Newman, 2009); several steps were taken to achieve maximum participation. A survey research firm with a history of working with Latino

communities was hired, and bilingual interviewers were instructed to initiate the survey in the language preferred by the respondent. Additionally, respondents were unaware of the survey's association with government groups until after the data were collected, although they were given an opportunity to withdraw from the study at any time.

### **Measurement of Key Concepts**

This survey measured WVOs using a 14-item battery designed to assess the two primary orientations, domination and mutualism, consistent with prior WVO research (Teel, et al., 2005; Manfredo et al., 2009; Teel & Manfredo, 2009; Teel et al., 2010). The domination orientation was comprised of two belief dimensions, hunting and appropriate use of wildlife, while the mutualism orientation consisted of caring and social affiliation belief dimensions. Responses to each of the 14 items were collected on a seven-point agree/disagree scale for all participants (Table 1). For Latinos only, acculturation was measured using a 12-item battery referenced frequently in the literature: the short acculturation scale for Hispanics, measured on a five-point scale (Marin, Sabogal, Marin, Otero-Sabogal, & Perex-Stable, 1987; Table 2). Life values were measured using a derivation of Inglehart's World Values Survey (Inglehart & Welzel, 2005), using six survey items. For each item, a statement was made juxtaposing the importance of a materialist ideal with a postmaterialist ideal (e.g.; I feel that maintaining a high level of economic growth is more important than making our cities more beautiful). Each statement, presented in random order, was followed by a five-point agree/disagree scale for participant responses (Table 3). Attitudes toward wildlife management actions and attitudes, norms, and behavioral intentions regarding hunting and fishing were also measured using a five-point agree/disagree scale (Table 3).

Demographics included education (1=<GED, 2=GED, 3=2-year degree, 4=4-year degree, 5=advanced degree), income (1=0-20, 2=20-40, 3=40-60, 4=60-80, 5=80-100, 6=100-120, 7=120+ [in thousands]), gender, age, and type of residence growing up (1=large city/urban area, 2=suburban area, 3=small town, 4=rural farm or ranch, 5=rural NOT on a farm or ranch). In addition, the following variables were included to obtain more background information for comparative purposes among Latinos: years residing in the U.S., birth country, and generations residing in the U.S. (1=I am the first person of my family to live in the U.S., 2=one of my parents was the first person of my family to live in the U.S., 3=one of my grandparents was the first person of my family to live in the U.S., 4=one of my great grandparents was the first person of my family to live in the U.S., 5=my family has been in the U.S. longer than four generations).

### **Data Analysis**

The Statistical Package for the Social Sciences, SPSS/PASW 18.0 was used for all statistical analyses. Reliabilities were determined using Cronbach's alpha, and when sufficiently high (Cortina, 1993), survey items were aggregated into mean composite scales. The four-item hunting belief dimension and the three-item appropriate use of wildlife belief dimension were combined into a mean composite scale representing the domination WVO. Analogously, the four-item social affiliation belief dimension and the three-item caring belief dimension were combined into a mean composite scale representing the mutualism WVO (Table 1). Consistent with prior WVO research, a four-group typology of WVOs was generated using an approximate median split (4.5 to standardize with other research) on the domination and mutualism scales (Teel & Manfreda, 2009; Teel et al., 2010). Those high on domination and low on mutualism belong to the Traditionalist type who believe that wildlife should be used and managed primarily for human benefit and tend to prioritize human well-being over wildlife. Those low on

domination and high on mutualism are Mutualist types who tend to view wildlife as if part of an extended family that is deserving of rights and caring. Individuals measuring high for both WVOs are Pluralists type, as they have the capability to demonstrate either or both WVOs contingent upon the context of the wildlife interaction (Tetlock, 1986). Those that do not significantly identify with either WVO are in the Distanced type, and tend to be less interested in wildlife and wildlife-related issues (Table 4; see also Teel et al, 2010; Teel & Manfredi, 2009).

To determine if there was a significant difference between the WVOs of Caucasians and Latinos *F*-tests were performed on the domination and mutualism WVO scales. A crosstabulation and  $\chi^2$  analysis explored potential differences between Caucasians and Latinos on WVO types. To explore the heterogeneity of WVOs within the Latino community, a K-means cluster analysis (see de Craen, Commandeur, Frank, & Heiser, 2006; Leisch, 2006; Cheong & Lee, 2008) was performed. Variables of education, income, gender, age, type of residence growing up, acculturation, tenure of residency in the U.S., birth country, preferred language, and generations residing in the U.S. were included to produce distinct clusters of Latinos. The number of clusters included in the analysis was informed by Akaike's Information Criterion (AIC), silhouette measures of cluster cohesion and separation, and the need to represent extant variety of Latinos known to the researcher *a priori*. Because objective and subjective indicators did not yield appreciably different results (both generated average silhouettes of 0.2), five clusters were chosen to represent the heterogeneity of Latino communities. Clusters were then compared with respect to their life values, WVOs, attitudes toward wildlife management actions, and attitudes, norms, and behavioral intentions regarding hunting and fishing. Analyses of variance (*F*-tests) with a subsequent Student-Newman-Keuls post-hoc test were used to determine variability among the clusters.

Path analysis was used to accomplish the third objective of determining how various levels of cognition were related within the Latino community. Cognitions such as life values, WVOs, attitudes toward wildlife management actions, attitudes regarding hunting and fishing, behavioral intentions for future participation in hunting and fishing, and subjective norms surrounding hunting and fishing were also hierarchically associated to each other in a path diagram (Figure 1). Error within psychometric measurement artificially diminishes the relationship between two latent constructs that are known to correlate. Therefore, this measurement error, or attenuation, is corrected for by dividing the observed correlation between the two latent constructs by the square root of the product of reliabilities of those constructs (Furr & Bacharach, 2008).

## Results

The sample size obtained for this investigation allowed for a maximum margin of error of +/- 2.79% at the 95% confidence interval for both Caucasians ( $n=1,165$ ; response rate=36%) and Latinos ( $n=1,230$ ; response rate=19%). The sample purposefully overrepresented Latinos, as the goal of studying the heterogeneity within Latino communities could only be accomplished by doing so. Therefore, when discussing the general population at the state level, data are weighted by ethnicity to account for the overrepresentation of Latinos in the sample. Within the overall study sample, Latinos and Caucasians differed in several demographical areas. Throughout this study, a  $p$  value of less than 0.05 was used to denote statistical significance while effect sizes were used as an indicator of practical significance (see Vaske, 2008 for criteria for practical significance). As a whole, Latinos in our study were slightly younger ( $\bar{x}_{\text{Latino}}=41$ ,  $\bar{x}_{\text{Caucasian}}=49$ ;  $F(1, 1021) = 47.45$ ,  $p<0.001$ ), more likely to reside in urban areas ( $\chi^2(4 \text{ df}) = 139.57$ ,  $p<0.001$ ), and more likely to have lived in Arizona a longer period of time ( $\bar{x}_{\text{Latino}}=26.9$ ,  $\bar{x}_{\text{Caucasian}}=24.8$ ;  $F(1,$



2237) = 7.725,  $p=0.005$ ). In addition, they had a lower level of income as compared to Caucasians in the study ( $\bar{x}_{\text{Latino}}=\$47,700$ ,  $\bar{x}_{\text{Caucasian}}=\$75,400$ ;  $F(1, 1815) = 291.75$ ,  $p<0.001$ ) and had received less formal education (43.3% of Latinos achieved an education beyond high school compared to 80.4% of Caucasians;  $\chi^2(4 \text{ df}) = 455.27$ ,  $p<0.001$ ). Each Likert scale created within this research study had acceptable reliability (Tables 1-3).

### **WVOs and Ethnicity**

On the mutualism scale, Latinos ( $\bar{x}=5.66$ ) scored significantly higher than Caucasians ( $\bar{x}=5.09$ ;  $F=109.9$ ,  $p<0.001$ ,  $\eta=0.194$ ). Conversely, on the domination scale, Latinos ( $\bar{x}=4.74$ ) scored significantly lower than Caucasians ( $\bar{x}=5.11$ ;  $F=50.0$ ,  $p<0.001$ ,  $\eta=0.165$ ). Interestingly, when factors associated with modernization (namely education, income, and type of residence during maturation) were held constant, the estimated mean difference between Latinos ( $\bar{x}=5.53$ ) and Caucasians ( $\bar{x}=5.24$ ) was reduced but still remained statistically different for mutualism ( $F=14.7$ ,  $p<0.001$ ,  $\eta=-0.09$ ). Additionally, the difference between Latinos ( $\bar{x}=4.77$ ) and Caucasians ( $\bar{x}=5.10$ ) on the domination WVO was also slightly reduced once the potentially confounding effects of education, income, and type of residence during youth were held constant ( $F=22.1$ ,  $p<0.001$ ,  $\eta=0.12$ ).

The differences in WVOs between ethnicities were reflected in comparisons using the WVO type as well ( $\chi^2(df=3) = 115.8$ ,  $p<0.001$ ,  $\phi_c=0.226$ ). Within the chi-square analysis, a z-test was used to assess differences in proportions belonging to the four WVO types across ethnicities. Distanced individuals were the smallest group for both ethnicities, and occurred in statistically equivalent proportions (3.7% Latinos, 4.1% Caucasians;  $Z=ns$ ). The Pluralist type, on the other hand, was the largest group for both ethnicities, but Latinos were proportionally higher in this group (50.1% Latinos, 42.0% Caucasians;  $Z=3.78$ ;  $p<0.001$ ). Latinos were also

proportionally higher in the Mutualist category (35.2% Latinos, 25.6% Caucasians;  $Z=4.82$ ;  $p<0.001$ ), but underrepresented in the Traditionalist type (10.9% Latinos, 28.3% Caucasians;  $Z=10.58$ ,  $p<0.001$ ).

### **Heterogeneity of WVOs within Latino Communities**

The WVOs of Latinos and Caucasians were different; however, the variation within ethnicities was far greater than between ethnicities. Patterns of WVOs among Latinos were similar to those for other previously-studied populations (e.g., Manfredo et al., 2009, Zinn & Pierce, 2002) in that they were influenced by gender ( $F_{mutualism}=22.7$ ,  $p<0.001$ ;  $F_{domination}=66.9$ ,  $p<0.001$ ) and age ( $r_{mutualism}=-0.056$ ,  $p=ns$ ;  $r_{domination}=0.083$ ,  $p=0.004$ ), with females and youth tending to be more mutualistic and less domination-oriented. However, acculturation was also an important explanatory factor for the variance seen within the Latino population. As individuals became increasingly more acculturated their mutualism WVO score tended to increase ( $r=0.22$ ,  $p<0.001$ ) and their domination WVO score tended to decrease ( $r=-0.10$ ,  $p<0.001$ ). Further evidence of the impact of acculturation could be found in results of the cluster analysis (Table 5). In particular, Clusters 2 ( $C_2$ ) and 3 ( $C_3$ ) were similar in age and education, but  $C_2$  was the least acculturated (it also contained the fewest U.S.-born respondents, had been in the U.S. the fewest generations, and lived outside the U.S. the longest), and  $C_3$  was the most acculturated (this group had the most U.S.-born respondents, had been in the U.S. the most generations, and had the longest tenure in Arizona). Correspondingly,  $C_2$  had the highest mutualism WVO score (5.8) of all the clusters, and  $C_3$  had the highest domination WVO score (4.9).

The comparison between Clusters 1 and 5 also revealed information valuable for interpreting the relationship between acculturation and WVOs. These groups were nearly identical in age, income, and type of residence during the formative years. However,  $C_1$  consisted

of respondents who had only spent approximately a third of their lives in the U.S., while C<sub>5</sub> respondents had spent nearly all of their lives in the U.S. Accordingly, C<sub>1</sub> was less acculturated (2.9) than C<sub>5</sub> (3.5), and, consistent with results of the C<sub>2</sub>-C<sub>3</sub> comparison, scored significantly higher on the mutualism WVO (5.8;  $F=4.76, p<0.001$ ) as compared to the more acculturated group (5.5).

Cluster 4 was the youngest group, and individuals in this group generally had lived most of their lives in Arizona, primarily in a suburban area. Their education level was low relative to the other groups, but this was likely attributable to their young age rather than a lack of attainment. Their use of Spanish was moderate, with approximately a fifth participating in the survey in Spanish. This group received a relatively high score on mutualism (5.8) and scored lower on the domination WVO scale (4.5) than other groups.

### **WVOs and Other Levels of Cognition**

Consistent with relationships specified by WVO theory (Manfredo et al., 2009) and the cognitive hierarchy (Homer & Kahle, 1988), path analysis results for the Latino population indicated values correlated with WVOs. As expected, the postmaterialist value correlated with the mutualism WVO ( $r=0.174$ ) and the materialist value correlated with the domination WVO ( $r=0.246$ ). These values and WVOs in turn impact the attitudes that direct behaviors in a wildlife-related context (Figure 1). To illustrate the directional nature of these relationships, groups C<sub>1</sub> and C<sub>2</sub> scored relatively higher on the postmaterialist life values and mutualism WVO scales, held the least favorable attitudes toward consumptive forms of wildlife-related recreation, were less approving of lethal removal of nuisance/threatening wildlife, and indicated the least likelihood of hunting or fishing in the future. The groups that were more mutualistic were also more likely to report subjective norms that were less approving of hunting and fishing.

Conversely, groups C<sub>3</sub> and C<sub>5</sub> tended to score higher on the materialist life values and domination WVO scale and were correspondingly more positive toward hunting and fishing, more accepting of lethal removal of nuisance/threatening wildlife, and indicated more interest in hunting and fishing (particularly the significantly younger C<sub>5</sub>). The groups that were more domination-oriented were also more likely to report norms that were more approving of hunting and fishing (Table 5). Finally, as confirmation to the previous hypothesis that acculturation affects cognitions regarding wildlife, C<sub>1</sub> and C<sub>2</sub> were the least acculturated groups and C<sub>3</sub> and C<sub>5</sub> groups were the most acculturated.

## **Discussion**

The intent of our investigation was to examine WVOs among different ethnic groups, building upon the compendium of exploratory international and cross-cultural research in this area (Dayer et al., 2007; Teel et al., 2007; Teel et al., 2010). Expressly, the goal was to augment agency understanding of how Latinos relate to wildlife while simultaneously advancing WVO theory in a cross-cultural context. While our results indicated that Latinos clearly perceive the wildlife resource differently from Caucasians, their perceptions were found to vary significantly by acculturation level, suggesting that the Latino audience should not be viewed as a monolithic segment of the public. Further, we determined that these differences have important implications for both theory and management in that they translate into variation in attitudinal and behavioral responses regarding wildlife-related issues.

### **WVOs of Latino Communities**

Our findings with respect to the elevated manifestation of the mutualism WVO and the reduced prevalence of a domination WVO among Latinos, particularly those who are less acculturated, as compared to Caucasians, has inferences for the life values frameworks presented

herein. For example, Schwartz's (2006) research places the U.S. population strongly within the mastery realm of the life values spectrum, with Mexico, as a nation, more likely to emphasize a harmony/egalitarian orientation. Our findings are consistent with predictions stemming from Schwartz's model given that the mutualism WVO, believed to be reflective of a broader egalitarian ideology, was more prevalent among Latinos, particularly among those less acculturated to the U.S.; however more definitive research is needed.

Conversely, results seem somewhat inconsistent with the predictions of Modernization Theory (Inglehart, 1997), which contends that people from less developed countries such as Mexico are more likely to emphasize materialist (as opposed to postmaterialist) values. Materialist values have been shown through previous research to correspond to a domination WVO, whereas postmaterialist values are more readily linked to a mutualism orientation toward wildlife (Manfredo et al., 2009). Upon closer examination, there may be several explanations for these unanticipated findings. For example, the 2000 wave of Inglehart's World Values Survey clearly indicates that citizens of Mexico are more likely to have materialist values compared to Americans; however, results from other waves of the survey are not as definitive (World Values Survey, 2009). Another possible explanation may be found when considering the origin of a mutualism orientation. Inglehart (1997) argues that postmaterialist values are primarily cultivated in situations of economic security wherein quality of life and self-actualization concerns are motivations for seeing the natural environment as something to be cared for or protected (a perspective consistent with a mutualism WVO). Yet, similar to proposals made by Dunlap et al. (1993) and others who have identified reasons for a rise in environmental concern in developing countries, one could argue that a mutualism orientation may also be spawned in poverty-stricken environments wherein individuals are reliant upon their natural surroundings,

including wildlife, for subsistence living. Their motivation for caring for the environment and its resources is derived from a sense of self-preservation to meet basic physiological needs, rather than from an interest in self-actualization or fulfillment of other higher-order needs (Dunlap et al., 1993; Dunlap & York, 2008). The effect of this confound may be exacerbated in Arizona where an estimated 19% of Latinos are undocumented (Passel & D’Vera Cohn, 2011), often coming from semi-subsistence rural economies (Alba & Nee, 1997; Roberts, Frank, & Lozano-Ascencio, 1999). Because of the continued abstruse nature of the relationship of life values and WVO theory, continued research, particularly cross-cultural investigations, is recommended.

### **Acculturation**

For wildlife conservation to continue under the current model, it is important to understand the diversity of interests within a society (Teel & Manfredi, 2009). This investigation augments that understanding by focusing on subcultures defined by ethnicity as well as understanding the variation within an ethnical subculture. There is utility in exploring these subcultures because our findings documented important differences in WVOs between ethnicities. Our findings also justify a caution against assuming that all Latinos are equally dissimilar from Caucasians; this would be too simplistic of a model, as confirmed by the diversity of perspectives revealed in our sample. Less acculturated Latinos were generally more mutualistic and less accepting of utilitarian treatment of animals, whether via management action or through consumptive recreation. More acculturated Latinos tended to more closely resemble their Caucasian counterparts, in that they were relatively more domination-oriented and more accepting of extractive management actions and hunting and fishing. This connection between acculturation and the way wildlife is perceived may be useful to inform management actions in areas that are predominantly Latino. This information may also prove valuable in efforts aimed

at recruiting Latinos into wildlife-related recreation or engaging Latinos on wildlife conservation topics. More generally, as suggested by our findings, culture is an important factor contributing to the variation in WVOs present in the U.S., and it is therefore a recommended topic for future research on human-wildlife and human-nature relationships.

### **Other Cognitions Related to Wildlife**

The link we established between WVOs and the wildlife-related attitudes and behaviors of Latinos lends additional credence to the argument that culture and acculturation are important factors to consider in WVO theory and research. For instance, the least acculturated Latino group in our sample was the most mutualistic and had the least tolerance for traditional forms of wildlife management, was less approving of consumptive wildlife-related recreation activities, and was least likely to express interest in participating in such activities in the future. The more acculturated groups showed nearly the opposite patterns; they had the most positive attitudes toward hunting and fishing and had the greatest intentions to participate in these activities in the future. Life values were correlated with these other levels of cognition, although to a lesser degree than expected, possibly due to the small amount of variance on values measures within the sample. In addition to demonstrating these cognitions relate specifically in Latino communities, these findings confirm the predictive validity of these concepts for use in future cross-cultural applications.

Agencies can take advantage of this research in their outreach to Latinos by customizing appropriate messaging tailored for the different segments identified within the Latino community. For example, those who are less acculturated and who speak Spanish in the home or as a primary language are more likely to have a mutualism WVO. Therefore they may be less accepting of management actions that cause harm to individual wildlife and may be better

engaged through emphasis on the ecological and inherent qualities of wildlife rather than the satisfaction derived from consumptive wildlife-related recreation. Nevertheless, Latinos may be receptive to messages promoting engagement in wildlife viewing and other non-consumptive forms of wildlife-related recreation.

Our results are reflective of the findings of Cordell and colleagues (2002), who found ethnicity affects how a respondent values natural resources and how they utilize those resources. Utilization, in terms of recreational use, has also been shown to vary across ethnicities (Beehler, McGuinness, & Vena, 2003; U.S. Fish & Wildlife Service, 2007). In similar fashion to our hypothesizing, Lopez and colleagues (2007) also expected to see variation in attitudes toward natural resources according to level of acculturation, although they were not successful in demonstrating a correlation between these two variables. The intention of the research presented herein is to augment these and other studies of Latinos and their interactions with natural resources.

### **Implications**

This study builds upon a strong research tradition of WVO theory and contributes to our understanding of how diverse audiences relate to wildlife and the natural environment. Although prior research indicates that values and WVOs tend to be static within individuals and change occurs gradually at a societal level across generations (Manfredo & Teel, 2008; Manfredo et al., 2009; Inglehart, 1997; Inglehart & Welzel, 2005), understanding the mechanism by which this happens cross-culturally is important to advancing WVO theory. This theory is expanded through the confirmation of the existence of the mutualism and domination WVOs within the Latino communities of the American Southwest, a finding suspected, but not empirically demonstrated in prior literature. Our findings corroborate those of several qualitative studies



conducted in various cultures (see *Human Dimensions of Wildlife*, volume 12, issue 5), as well as an exploratory quantitative study in 10 European countries (Teel et al., 2010), that have detected these orientations in cultures outside of the United States. In this way, our results shed additional light on the WVO concept's validity as well as the prevalence of specific forms of wildlife-related thought in other cultural contexts. It also advances theoretical knowledge by examining WVOs *across*, and simultaneously *within*, understudied cultures and subcultures.

Agencies can benefit from using WVOs to better understand different audiences as their constituencies begin to diversify culturally and in the way they interact with and think about wildlife. The Latino audience, in particular, is one of the fastest growing population segments in the United States (Schuett, Scott, & O'Leary, 2009) and one that up until now has been largely underrepresented in wildlife-related activities (U.S. Fish and Wildlife Service, 2007). In addition to serving as a baseline for improved agency awareness of how Latino perspectives may differ from those of the predominant culture in the U.S., managers may consider using this knowledge to inform management actions that may disproportionately affect Latinos. For example, decisions about how to handle human-wildlife conflict in predominately Latino neighborhoods would be more acceptable if no direct harm was experienced by the wildlife. Also, this information could be used to tailor messages for different segments of the public to utilize the potential latent demand for wildlife-related recreation within the Latino communities. Specifically, outreach efforts may focus on wildlife appreciation and enjoying wildlife within urban areas. Capitalizing on this latent demand is particularly salient to agencies concerned with building greater trust and political capital among underrepresented audiences, who may inject broader enthusiasm into wildlife conservation efforts. As the Latino population continues to grow in the United States, Latinos and the cultures of their native countries will become an

increasingly more important part of the American identity. As such, the approach that Latinos take in their interactions with wildlife and their responses to wildlife-related issues will have an influence on how America as a whole perceives wildlife. Knowing how Latinos and Caucasians compare will also be helpful as agencies seek to evolve toward a more sophisticated North American Model of Wildlife Conservation.

### **Future Research Needs**

There is an overall need for more cross-cultural WVO research in the various cultures around the world. However, collecting social science data across cultures can be problematic, as quantitative methods assume participants interact with the survey instrument uniformly, a possibly erroneous assumption when applied to cross-cultural data collection (Dayer et al., 2007). Recent qualitative methods that show promise for exploring human-wildlife relationships across cultures (e.g., Dayer et al., 2007; McCoy, 2010) examine emotional reactions to stimuli in the form of a photograph or prompt for an experience about wildlife. Despite the potential, future research is needed to compare quantitative and qualitative measurement methodologies to establish if the quantitative approach has sufficient equivalence among diverse audiences and in other cultural contexts (an issue addressed in Chapter III).

Once there are sufficient WVO assessments across different cultures, there may soon be enough data to conduct meta-analyses that elucidate the relationship between life values and WVOs. Specifically, meta-analyses relating the results of recent international WVO assessments (Teel et al., 2010 as well as *Human Dimensions of Wildlife*, 12[5]) to the findings of several life values research efforts conducted by Schwartz (2006), Franzen and Meyer (2010), or Inglehart and Welzel (2005) would be a fruitful area for future research. Exploring the relationship between life values and WVOs at the population or societal level would augment research that

has already demonstrated that connection at the individual level (Manfredo, Teel, & Henry, 2009). For the purposes of this meta-analysis, we recommend that countries of Hispanic origin be included in future WVO assessments to serve as an important benchmark for comparison to this study and corroboration of our findings.

Additional research in the areas mentioned above will be useful in increasing the cross-cultural application and utility of the WVO concept. Although our research indicates there are differences between Latinos and Caucasians, further research is needed to explore those differences, as well as variance within Latino cultures and the potential disparities between Latinos and other ethnicities. By expanding knowledge about WVOs in various communities we would enhance social science theory as it applies to natural resource-related topics as well as assist wildlife conservation organizations in directing programs and services for diverse audiences.

Table 1 Survey items and reliability results for wildlife value orientations and their respective belief dimensions from 2010 and 2011 surveys of Arizonans ( $n=2,395$ ).

Wildlife Value Orientation, basic belief dimension, and basic belief item <sup>1</sup>	Reliability <sup>2</sup>		
	Latinos	Caucasian	Total
Domination Wildlife Value Orientation	.61	.73	0.67
Appropriate Use Belief Dimension	.53	.55	0.56
Humans should manage fish and wildlife population so that humans benefit			
The needs of humans should take priority over fish and wildlife protection			
Fish and wildlife are on earth primarily for people to use			
Hunting Belief Dimension	.66	.78	0.74
We should strive for a world where there's an abundance of fish and wildlife for hunting and fishing			
Hunting is cruel and inhumane to animals <sup>3</sup>			
Hunting does not respect the lives of animals <sup>3</sup>			
People who want to hunt should be provided the opportunity to do so			
Mutualism Wildlife Value Orientation	.81	.83	0.82
Social Affiliation Belief Dimension	.73	.79	0.77
We should strive for a world where humans and wildlife and fish can live side by side without fear			
I view all living things as part of one big family			
Animals should have rights similar to the rights of humans			
Wildlife are like my family and I want to protect them			
Caring Belief Dimension	.67	.67	0.68
I care about animals as much as I do other people			
I feel a strong emotional bond with animals			
I value the sense of companionship I receive from animals			

<sup>1</sup> Item response scale: 1 (strongly disagree) to 7 (strongly agree)

<sup>2</sup> Reliabilities measured as Cronbach's  $\alpha$

<sup>3</sup> Item was reverse coded prior to analysis

Table 2 Survey items and reliability results for the Short Acculturation Scale for Hispanics (SASH) and its subscales from a 2011 survey of Latino communities in Arizona.

	Cronbach's $\alpha$
Acculturation Scale	0.92
Language subscale <sup>1</sup>	0.93
In general, what language(s) do you read and speak?	
What was the language(s) you used as a child?	
What language(s) do you usually speak at home?	
In which language(s) do you usually think?	
What language(s) do you usually speak with your friends?	
In what language(s) are the TV programs you usually watch?	
In what language(s) are the radio programs you usually listen to?	
In general, what language(s) are the movies, TV and radio programs you prefer to watch and listen to	
Social subscale <sup>2</sup>	0.80
Your close friends are	
You prefer going to social gatherings/parties at which people are	
The persons you visit or who visit you are	
If you could choose your children's friends you would want them to be	

<sup>1</sup>Response categories for Language Subscale: 1-Only Spanish, 2-More Spanish than English, 3-Both equally, 4-More English than Spanish, 5-Only English

<sup>2</sup>Response categories for Social Subscale: 1-All Latinos, 2-More Latinos than Americans, 3-About half and half, 4-More Americans than Latinos, 5-All Americans

Table 3 Survey items and reliability results for various levels of cognition from a 2011 survey of Latinos in Arizona

Levels of cognition <sup>1</sup>	Reliability
Life Values	0.66 <sup>2</sup>
I feel that maintaining order in the nation is more important than protecting freedom of speech	
I feel that maintaining a high level of economic growth is more important than making our cities more beautiful	
I feel that fighting rising prices is more important than giving people more say in important government decisions	
I feel that progressing toward a more humane society is more important than maintaining a stable economy <sup>3</sup>	
I feel that living in a society in which ideas count more than money is more important than fighting crime <sup>3</sup>	
I feel that making sure people have more say in how things are done at their jobs and their communities is more important than this country having strong defense forces <sup>3</sup>	
Attitudes toward wildlife recreation	0.67 <sup>4</sup>
Fishing is acceptable to me personally	
Hunting is acceptable to me personally	
Attitudes toward wildlife management actions	0.79 <sup>2</sup>
If it is seen near your home	
If it is a nuisance near your home. For example it gets into trash or damages landscaping	
If it has a disease that may spread to humans	
If it attacks a pet near your home	
If it attacks a person near your home	
Behavioral intention toward wildlife recreation	0.73 <sup>4</sup>
I plan to go fishing in the future	
I plan to go hunting in the future	
Subjective norms regarding wildlife recreation	0.70 <sup>4</sup>
My family, friends and other people important to me would approve of me if I were fishing	
My family, friends and other people important to me would approve of me if I were hunting	

<sup>1</sup> Item response scale for all levels of cognition: 1 (strongly disagree) to 5 (strongly agree)

<sup>2</sup> Reliability is given as Cronbach's Alpha

<sup>3</sup> Item was reverse coded prior to scale aggregation

<sup>4</sup> Reliability is given as a Pearson's correlation because the scale only has two measures

Table 4 A four group typology of Wildlife Value Orientations (adapted from Teel et al., 2010)

Mutualism	High	<p><b>Mutualists.</b> Have a mutualism orientation, viewing wildlife as capable of relationships of trust with humans, as if part of an extended family, and as deserving of rights and caring. They are less likely to support actions resulting in death or harm to wildlife, more likely to engage in welfare-enhancing behaviors for individual animals, and more likely to view wildlife in human terms.</p>	<p><b>Pluralists.</b> Have both a mutualism and a domination value orientation toward wildlife. The influence of the two value orientations is believed to be situationally contingent, meaning that which of the orientations plays a role is dependent upon conditions of the given issue or situation (Tetlock, 1986). For certain issues, Pluralists are likely to respond in a manner similar to that of Traditionalists, whereas for other issues they may behave more like Mutualists.</p>
	Low	<p><b>Distanced.</b> Do not have either a mutualism or a domination orientation. As their label suggests, they tend to be less interested in wildlife and wildlife-related issues.</p>	<p><b>Traditionalists.</b> Have a domination orientation, believing that wildlife should be used and managed primarily for human benefit. They are more likely to prioritize human well-being over wildlife in their attitudes and behaviors. They are also more likely to find justification for treatment of wildlife in utilitarian terms and to rate actions that result in death or harm to wildlife as acceptable.</p>
		Low	High
Domination			

Table 5 Characteristics of five clusters of Latinos from a 2011 survey of Latino communities in Arizona.

Factor	Cluster					<i>F</i>	Correlation	
	1 n=162	2 n=149	3 n=264	4 n=364	5 n=291		Mutualism	Domination
<b>Demographics</b>								
Time in Arizona <sup>1</sup>	9.6 <sup>a</sup>	21.7 <sup>b</sup>	53.7 <sup>c</sup>	15.4 <sup>d</sup>	31.3 <sup>e</sup>	1333.40 <sup>**</sup>	-.036	.090 <sup>**</sup>
US born <sup>2</sup>	51 <sup>a</sup>	32 <sup>b</sup>	88 <sup>c</sup>	72 <sup>d</sup>	84 <sup>c</sup>	57.95 <sup>**</sup>	-.195 <sup>**</sup>	.060 <sup>*</sup>
Generations in US	2.6 <sup>a</sup>	2.6 <sup>a</sup>	3.7 <sup>b</sup>	2.7 <sup>a</sup>	3.5 <sup>c</sup>	35.68 <sup>**</sup>	-.072 <sup>*</sup>	.062 <sup>*</sup>
Language <sup>3</sup>	35 <sup>a</sup>	38 <sup>a</sup>	4 <sup>b</sup>	20 <sup>c</sup>	6 <sup>b</sup>	37.61 <sup>**</sup>	-.173 <sup>**</sup>	.012
Residence growing up <sup>4</sup>	1.7 <sup>a</sup>	1.6 <sup>a</sup>	2.1 <sup>b</sup>	1.8 <sup>a</sup>	1.7 <sup>a</sup>	6.66 <sup>**</sup>	-.023	.081 <sup>**</sup>
Education	2.4 <sup>a</sup>	2.3 <sup>a</sup>	2.3 <sup>a</sup>	2.2 <sup>a</sup>	2.6 <sup>b</sup>	8.06 <sup>**</sup>	-.207 <sup>**</sup>	.081 <sup>**</sup>
Income	2.8 <sup>a</sup>	2.4 <sup>b</sup>	3.0 <sup>a</sup>	2.5 <sup>b</sup>	3.2 <sup>a</sup>	8.63 <sup>**</sup>	-.209 <sup>**</sup>	.091 <sup>**</sup>
Age <sup>5</sup>	1.6 <sup>a</sup>	2.7 <sup>b</sup>	3 <sup>c</sup>	1.3 <sup>d</sup>	1.6 <sup>a</sup>	301.0 <sup>**</sup>	-.056	.083 <sup>**</sup>
Time abroad <sup>1</sup>	15 <sup>a</sup>	20 <sup>b</sup>	10 <sup>c</sup>	5 <sup>d</sup>	6 <sup>d</sup>	41.36 <sup>**</sup>	.165 <sup>**</sup>	.025
Acculturation <sup>6</sup>	2.9 <sup>a</sup>	2.7 <sup>b</sup>	3.5 <sup>c</sup>	3.1 <sup>d</sup>	3.5 <sup>c</sup>	35.21 <sup>**</sup>	-.223 <sup>**</sup>	.114 <sup>**</sup>
<b>Life Values</b>								
Materialist	3.2 <sup>a</sup>	2.9 <sup>b</sup>	3.0 <sup>a,b</sup>	3.0 <sup>a,b</sup>	3.1 <sup>a,b</sup>	2.13	-	.246 <sup>**</sup>
Postmaterialist	3.1 <sup>a</sup>	2.9 <sup>b</sup>	3.1 <sup>a</sup>	3.0 <sup>a,b</sup>	3.1 <sup>a</sup>	5.47 <sup>**</sup>	.174 <sup>**</sup>	-
<b>Wildlife Value Orientations</b>								
Mutualism	5.8 <sup>a,b</sup>	5.8 <sup>a</sup>	5.6 <sup>b,c</sup>	5.8 <sup>a,b</sup>	5.5 <sup>c</sup>	4.76 <sup>**</sup>	-	-
Domination	4.8 <sup>a,b</sup>	4.7 <sup>a,b</sup>	4.9 <sup>a</sup>	4.5 <sup>b</sup>	4.8 <sup>a</sup>	4.64 <sup>**</sup>	-	-
<b>Attitudes-Management<sup>7</sup></b>								
... is near your home	2.2 <sup>a</sup>	2.2 <sup>a</sup>	2.6 <sup>b</sup>	2.4 <sup>a,b</sup>	2.4 <sup>a,b</sup>	3.14 <sup>*</sup>	-.146 <sup>**</sup>	.159 <sup>**</sup>
... is a nuisance	2.2 <sup>a</sup>	2.2 <sup>a</sup>	2.7 <sup>b</sup>	2.5 <sup>a,b</sup>	2.4 <sup>a</sup>	5.30 <sup>**</sup>	-.140 <sup>**</sup>	.164 <sup>**</sup>
... has a disease	3.9 <sup>a,b</sup>	3.8 <sup>a</sup>	4.1 <sup>b</sup>	3.9 <sup>a,b</sup>	4.0 <sup>a,b</sup>	2.78 <sup>*</sup>	-.173 <sup>**</sup>	.154 <sup>**</sup>
... attacks a pet	3.1 <sup>a</sup>	3.2 <sup>a</sup>	3.7 <sup>b</sup>	3.3 <sup>a</sup>	3.4 <sup>a,b</sup>	5.62 <sup>**</sup>	-.124 <sup>**</sup>	.160 <sup>**</sup>
... attacks a person	3.7 <sup>a</sup>	3.7 <sup>a</sup>	4.1 <sup>b</sup>	3.8 <sup>a,b</sup>	4.1 <sup>b</sup>	5.05 <sup>**</sup>	-.189 <sup>**</sup>	.148 <sup>**</sup>
<b>Attitudes<sup>7</sup></b>								
Fishing	3.8 <sup>a</sup>	3.8 <sup>a,b</sup>	4.0 <sup>a,b</sup>	3.8 <sup>a,b</sup>	4.1 <sup>b</sup>	3.39 <sup>**</sup>	-.182 <sup>**</sup>	.359 <sup>**</sup>
Hunting	2.8 <sup>a</sup>	3.0 <sup>a,b</sup>	3.2 <sup>b,c</sup>	3.0 <sup>a,b</sup>	3.5 <sup>c</sup>	7.19 <sup>**</sup>	-.296 <sup>**</sup>	.518 <sup>**</sup>
<b>Behavioral Intention<sup>8</sup></b>								
Fishing	3.1 <sup>a</sup>	2.8 <sup>b</sup>	3.0 <sup>a</sup>	3.2 <sup>a</sup>	3.5 <sup>c</sup>	9.85 <sup>**</sup>	-.175 <sup>**</sup>	.343 <sup>**</sup>
Hunting	2.3 <sup>a,b</sup>	2.2 <sup>a</sup>	2.3 <sup>a,b</sup>	2.5 <sup>b</sup>	2.6 <sup>b</sup>	3.98 <sup>**</sup>	-.193 <sup>**</sup>	.412 <sup>**</sup>
<b>Subjective Norm<sup>9</sup></b>								
Fishing	3.7 <sup>a</sup>	3.7 <sup>a</sup>	4.1 <sup>b,c</sup>	4.0 <sup>b</sup>	4.3 <sup>c</sup>	11.64 <sup>**</sup>	-.162 <sup>**</sup>	.264 <sup>**</sup>
Hunting	3.1 <sup>a</sup>	3.1 <sup>a</sup>	3.5 <sup>b</sup>	3.2 <sup>a</sup>	3.8 <sup>b</sup>	10.63 <sup>**</sup>	-.270 <sup>**</sup>	.391 <sup>**</sup>

<sup>1</sup> Measured in years

<sup>2</sup> Percentage of Latinos that were born in the United States

<sup>3</sup> Percentage of interviews in each cluster that were conducted in Spanish

<sup>4</sup> Lower values signify more urbanized, higher numbers signify more rural environments

<sup>5</sup> Age measured as (1=18-34, 2=35-49, 3=50-65, 4=66+)

<sup>6</sup> Higher values indicate higher acculturation to US culture

<sup>7</sup> Higher values indicate higher acceptability for lethal removal

<sup>8</sup> Higher values indicate higher intention to participate in the activity in the future

<sup>9</sup> Higher values indicate more acceptable subjective norm

\* Significant at  $p < 0.05$ , \*\* Significant at  $p < 0.01$



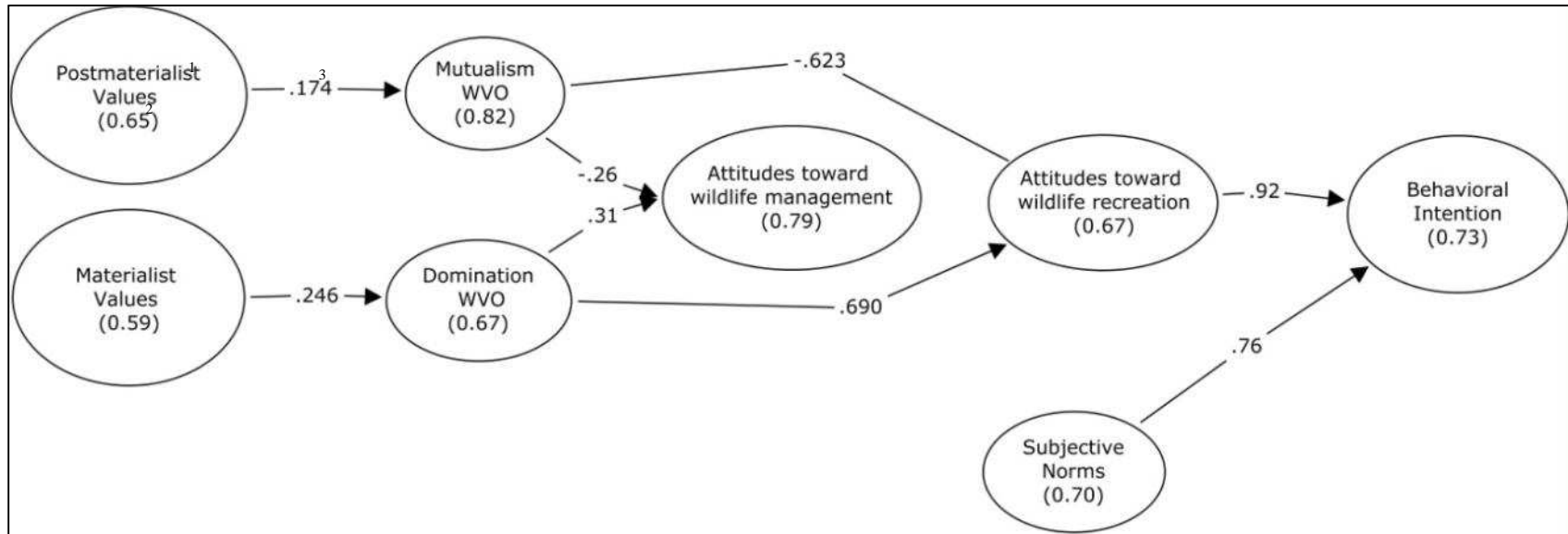


Figure 1 Path diagram showing the correlations between interrelated cognitions related to wildlife within Latino communities

<sup>1</sup> Life values are measured using a derivation of Inglehart's world values survey

<sup>2</sup> Numerical values in the parentheses are the internal reliability for each latent construct

<sup>3</sup> Correlations between latent constructs are corrected for attenuation to account for measurement error within each construct

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### III. A COMPARISON OF QUANTITATIVE AND QUALITATIVE METHODS TO MEASURE WILDLIFE VALUE ORIENTATIONS AMONG DIVERSE AUDIENCES: A CASE STUDY OF LATINOS IN THE AMERICAN SOUTHWEST

#### **Executive Summary**

To manage wildlife in the Public Trust, it is crucial for state wildlife agencies in the U.S. to systematically determine the will of the constituency that owns the wildlife. As the population of American society diversifies, and the public interest in wildlife-related issues broadens, it is essential that these agencies find ways to better understand and engage increasingly diverse audiences. Recently, researchers have augmented understanding of how people perceive wildlife via a framework of wildlife value orientations (WVOs). However, as agencies consider applying this framework in other areas to explore the wildlife-related interests of people from diverse backgrounds, it raises questions about the potential limitations of traditional survey methodologies for WVO assessment across cultures. In the interest of addressing this concern and considering alternative, mixed methods approaches, we examined WVOs in Latino communities in the American Southwest using two quantitative and two qualitative methodologies. We found sufficient correlations between measures resulting from these varied methods, suggesting that traditional quantitative assessments may still be a reliable means of capturing the WVOs of diverse audiences. Additionally, we identify scenarios wherein other methodologies may be advantageous.

## Introduction

In the United States, wildlife is owned by the people and held by the state in public trust<sup>7</sup>. To abide by this premise and manage wildlife in accordance with the collective will of their citizenry, state wildlife agencies (agencies) are increasingly tasked with finding ways to engage a broader and more diverse constituency. This is particularly the case in light of demographic changes that have led to greater ethnic diversity in American society (Schuett, Scott, & O'Leary, 2009; Cordell, Bergstrom, Betz, & Green, 2004). Historically, agencies have been less responsive to diverse ethnic groups (Allison & Hibbler, 2004) which tend to be underrepresented in outdoor activities (Solop, Hagen, & Ostergren, 2003) including wildlife-related recreation pursuits (U.S. Fish & Wildlife Service, 2007). Given their growing political and economic influence (Lopez, Lopez, Wilkins, Torres, Valdez, Teer, et. al, 2005), continued marginalization of these groups could lead to reduced political capital for agencies in the future. The long-term success of agencies and their wildlife conservation efforts is therefore contingent upon their ability to reach and provide services for ethnically diverse audiences that are a growing force within society.

To improve the effectiveness of agency efforts aimed at maintaining support from long-established stakeholders as well as embracing these emerging publics, there is a need to better understand the characteristics of diverse audiences, including their wildlife-related interests. While important advancements in this area have been made, including recent investigations of human thought regarding wildlife across cultures (e.g., see Dayer, Stinchfield, & Manfredo, 2007; Teel, Manfredo, & Stinchfield, 2007; Teel et al., 2010; McCoy, 2010; Hermann, Voß, & Menzel, 2013; Vaske, Jacobs, & Sijtsma, 2011), there is a dearth of information about how

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<sup>7</sup> A primary tenet of the North American Model is the Public Trust Doctrine which establishes that all natural resources universally belong to all people of the nation in which the resources are found, and that all citizens have equal access to those resources (Prukop & Regan, 2005; The Wildlife Society, 2010).



different methods for cross-cultural assessment compare and may be useful for this endeavor. Our research was aimed at addressing this gap in the literature through an examination of various methods for assessing the wildlife-related beliefs, as measured by wildlife value orientations, among Latinos in the American Southwest.

### **Wildlife Value Orientations**

Wildlife value orientation (WVO) theory offers a framework for exploring the wildlife-related interests of diverse publics (Manfredo, Teel, & Henry, 2009; Teel & Manfredo, 2009; Teel et al., 2010). This theory is based on the value-attitude-behavior model (Homer & Kahle, 1988; Manfredo, Teel & Henry, 2009) in which individual behavior is guided by a series of interrelated cognitions arranged in a hierarchical fashion. At the base of this hierarchy are values, which are broad, enduring beliefs (Rokeach & Ball-Rokeach, 1989). These values influence the formation of attitudes, which are defined as the association of an evaluation and an object (e.g., an issue, an entity, another person, a behavior) in memory (Ajzen & Fishbein, 1980). Attitudes by their nature are more malleable than values and act as the immediate antecedent to an individual's behavior. Values are held in common by individuals of a given culture (Inglehart & Welzel, 2005), rendering them largely ineffectual for explaining variation in individual attitudes *within* cultures (Bright, Manfredo & Fulton, 2000). Value orientations, which more readily capture this variation, are defined as “networks of basic beliefs that organize around values and provide contextual meaning to those values in relation to a particular domain such as wildlife” (Teel & Manfredo, 2009, p. 129). Specifically, wildlife value orientations (WVOs) are reflective of cultural ideologies that play an important role in shaping individuals' wildlife-related behaviors and attitudes toward issues dealing with wildlife treatment (Manfredo et al., 2009).

Prior literature primarily addresses a domination and a mutualism WVO (Manfredo, Teel, & Henry, 2009; Teel & Manfredo, 2009; Teel, et al., 2010). Individuals with a domination orientation believe the needs of humans supersede those of wildlife and perceive wildlife as a resource to be managed for the benefit of humans. They generally hold attitudes more favorable to actions involving utilitarian treatment of wildlife (e.g., hunting, lethal control) and are more likely to exhibit behaviors such as hunting and fishing. Individuals with a mutualism orientation believe wildlife are deserving of caring and rights similar to humans and view wildlife as potential companions capable of relationships of trust. They are less likely to support actions resulting in death or harm to wildlife and more likely to engage in behaviors such as wildlife viewing and feeding. These two primary WVOs have given rise to a four-group typology utilized in previous research (Table 6; Teel & Manfredo, 2009; Teel et al., 2010). Those scoring high on the domination WVO scale and low on mutualism belong to the Traditionalist type who believes that wildlife should be used and managed primarily for human benefit and tend to prioritize human well-being over wildlife. Those scoring low on the domination scale and high on mutualism are Mutualists, who tend to view wildlife as if part of an extended family that is deserving of rights and caring. Individuals scoring high on both dimensions are classified as Pluralists, as they have the capability to demonstrate either or both WVOs contingent upon the context of the wildlife issue or interaction (Tetlock, 1986). Those who do not significantly identify with either WVO are in the Distanced type, who tends to be less interested in wildlife and wildlife-related issues.

### **WVO Measurement within Diverse Audiences**

The need to expand the collective knowledge about human-wildlife relationships across cultures is imperative; however, there are several issues that may hinder this effort. WVOs have

historically been measured via a quantitative mail-back survey developed in the United States for use in predominately Caucasian populations (Fulton, Manfredi, & Lipscomb, 1996; Manfredi, Teel, & Bright, 2003; Teel & Manfredi, 2009). Yet, minority populations may be less likely to participate in traditional surveys, rendering them largely ineffective for collecting data from diverse audiences (Bruyere, Teel, Newman, 2009). Additionally, gaining survey item equivalence across languages can be challenging, especially within Latino cultures that have diverse countries of origin, each with its own vernacular, dialects, and patois. Furthermore, Likert-type scales traditionally used in WVO surveys may be foreign to some cultures (Spini, 2003) and can further complicate quantitative cross-cultural data collection (Dayer et al. 2007). To begin to address these concerns and the need for cross-cultural understanding, several recent exploratory studies investigating WVOs have occurred. Investigators have measured WVOs using qualitative methodologies in research conducted in the Netherlands, China, Estonia, Mongolia, and Thailand as part of the *Wildlife Values Globally* Research Program (see *Human Dimensions of Wildlife*, volume 12, issue 5). Another international effort to assess WVOs across cultures was a survey of residents in ten European countries conducted by Teel and colleagues (2010). In that multinational effort, researchers used surveys translated into the native language and face-to-face interviews. While these studies provide important initial baselines for comparison, it is empirically unknown how qualitative methods compare to quantitative techniques for WVO assessment (see McCoy [2010] for a recent exception). Likewise, the literature is sparse regarding how various cultures interact with the translated survey instrument in comparable ways to English-speaking North-Americans; however, there are recent notable exceptions (Hermann, Voß, & Menzel, 2013; Vaske, Jacobs, & Sijtsma, 2011, Teel et al., 2010), but none that extend to Spanish-speaking countries. Therefore, as the WVO quantitative

instrument is used within Latino communities, the outcomes may be considered suspect without further evaluation, particularly in relation to qualitative approaches that may more readily capture, in an in-depth way, the meaning people assign to topics of interest. Given these limitations and gaps in the literature, there is a need to explore alternative methodologies for examining WVOs, as well as a need to determine the adequacy of existing WVO measurement techniques in cross-cultural contexts.

### **Study Purpose**

In an effort to enhance agency understanding of diverse audiences as well as offset the potential inadequacies of traditional WVO assessment procedures, this manuscript reports on a mixed methods approach to measuring the WVOs of Latinos residing in the American Southwest. The purpose of this study was to expand WVO theory by extending its application to understudied cultures and to introduce and test new techniques that, if proven effective, could be adapted for use in a cross-cultural context in the future. Specific objectives were to (1) compare various methodologies for WVO measurement, (2) determine to what extent traditional survey methods adequately capture the WVOs of the Latino population, and (3) show what, if any, effects acculturation<sup>8</sup> of the respondent has on measurement viability, as culture may be a contributor to measurement error in quantitative assessments. Our assumption was that if the quantitative survey was shown to be a valid and reliable means of gauging the WVOs of Latinos in our study, this could strengthen the utility of such an approach for use with different cultures, as well as lay the foundation to expand applications of the WVO concept to Central and Latin America. This finding would have implications for potential meta-analyses that could be

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<sup>8</sup> Throughout this manuscript, the term acculturation is used to signify acculturation from the cultures of Latin America toward the prevailing culture of the Southwestern United States, and specifically to that of Arizona. This direction of valence does not imply the preference for one culture over another; rather, it is simply a description of the process specific to this research study and an attempt to avoid redundancy.

conducted across various cultures as well. However, if results of the different methodologies used here were not comparable, it would suggest the need for reliance on alternative methods of data collection when researching the WVOs of diverse audiences.

## **Methods**

### **Study Area**

Arizona is an ideal study area for examining various means of WVO assessment within Latino communities. Arizona is approximately one-third Latino, nearly twice the national average, and this statistic continues to rise (U.S. Census Bureau, 2009). Furthermore, Arizona has recently undergone rapid urbanization (Jenerette & Wu, 2001), and urban sprawl has led to an acceleration of human-wildlife conflict as well as increased strife among people with differing views regarding how wildlife should be managed. This juxtaposition of different constituencies with varied cultural backgrounds creates idyllic conditions to study diverse audiences generally, as well as how they interact with wildlife more specifically. Furthermore, as other states are expected to undergo similar demographic changes already seen in Arizona, this study may provide insight into how other agencies may prepare for future changes affecting wildlife conservation.

### **Sampling**

To obtain a representative sample of adult Latinos in the Phoenix metropolitan area, a research firm with a history of working with Latino communities was hired to recruit participants and assist with data collection. The research firm randomly contacted individuals from a Spanish surname sample that lived within a five mile radius of a local community center familiar to many Latinos in the geographic area and located in a predominately Latino neighborhood. In order to qualify for participation, respondents were required to be Latino and at least 18 years of age. The

research firm was instructed to obtain a good mix of gender and age groups; however formal strata were not used for this purpose. Based on prior participation rates, the research firm obtained a commitment from 70 individuals, expecting approximately 60 would ultimately participate. The quantity of 60 was chosen as a target to allow for a balance between statistical inference ability and financial constraints. Of the 70 people contacted by the research firm to participate, 58 came to the community center and subsequently agreed to contribute to the study. As participants arrived at the community center, they were registered by bilingual members of the research firm and asked in which language they preferred to participate. Five of the twelve data collection technicians were fluent in Spanish, as was the primary investigator (lead author on this manuscript). No participants indicated a preference to communicate in Spanish, although a few participants used Spanish to clarify their meanings during portions of the data collection effort.

### **Data Collection and WVO Measurement**

Data collection technicians were provided background on WVO theory and trained in interviewing protocols and specific WVO assessment procedures prior to the study. As part of this process, they viewed a mock interview performed by the primary investigator and conducted a sample interview in which the primary investigator played the research participant. Technicians then interviewed each other twice; during the first round, interviewees answered questions as they applied to their lives personally, and for the second round, they were instructed to role play by representing one of the four WVO types described earlier. Finally, the week prior to data collection, each technician interviewed the primary investigator twice as he was role playing different WVOs types. Debriefings were held after the initial training, during the one-on-one training with the primary investigator, and immediately prior to and after actual data collection.

A mixed methods approach adapted from prior quantitative and qualitative research was used to measure WVOs. Four methodologies, each of which is described in more detail below, were utilized: a quantitative survey (hereafter referred to as survey), a guided discussion of photos depicting various wildlife-related scenes (photos), interviews designed to elicit stories about wildlife (stories), and a quantitative self-identification approach (self-ID). Participants were semi-randomly assigned (because the stories and photos section had the potential to take longer to complete, early arrivers were assigned to those stations first) to one of three groups (A=Stories, B=Photos, C=Survey and Self-ID [collected together]), each of which was exposed to the four WVO assessment techniques in a different order to ensure the ordering of the methodologies did not bias results. Logistically, the survey and self-ID methods needed to be administered in the same location, so each of the three groups was split in half, with one half completing the survey first and the other half beginning with the self-ID method. For quality control purposes, each participant was assigned a unique alphanumeric code according to their assigned group and check-in order, taking the form of 'X-000'; participants are hereafter identified by their code to protect their anonymity.

The WVO **survey** methodology consisted of 14 belief items used in recent studies in the United States (Table 7; Manfredro et al., 2009; Teel & Manfredro, 2009; McCoy, 2010). The survey instrument, available in both English and Spanish, measured the two principle orientations, domination and mutualism. Reliabilities were determined using Cronbach's alpha, and when sufficiently high (Cortina, 1993), survey items were aggregated into mean composite scales. The four-item hunting belief dimension and the three-item appropriate use of wildlife belief dimension were combined into a mean composite scale representing the domination WVO (on a 7-point agree/disagree scale, with the higher values being more strongly representative of

the WVO). Analogously, the four-item social affiliation belief dimension and the three-item caring belief dimension were combined into a mean composite scale representing the mutualism WVO. Consistent with prior WVO research, a four-group typology of WVOs was generated using an approximate median split (4.5 to standardize with other research) on the domination and mutualism scales (Table 6; Teel & Manfredi, 2009; Teel et al., 2010). Because of the consistency of this approach with previous research, the survey methodology was not formally pretested.

The **photos** methodology, adapted from McCoy (2010), used video-recorded one-on-one interviews in which the participant was led into a guided discussion about emotional reactions to images depicting wildlife and human-wildlife interaction scenes (Figure 2). These images (replicated from McCoy, 2010) were chosen to be representative of each of the primary belief dimensions of the mutualism and domination WVOs. As a preamble for the interview, participants were informed that the technician was interested in the way they felt about wildlife, as well as their thoughts and opinions about nature. For each image, participants were asked how the photo made them feel, if they related to the photo, if they liked the photo, under what scenarios the scenes depicted might be more or less acceptable, as well as other questions that were specific to each image (e.g., for photo #6 participants were asked ‘Do you feel this is good for the children?’ to further explore how participants perceived the needs of humans relative to the needs of wildlife). This method capitalized on the congruity of primary emotions, such as happiness, sadness, anger, and fear, across cultures (Tanaka & Osgood, 1965), and in this way derives from the work of Dayer and colleagues (2007). The universality of emotions is believed to counteract the potentially confounding effects of various cultural contexts or circumstances and the influences of cognition while assessing WVOs (Dayer et al., 2007; Appendix G). After



discussing emotions and other reactions induced by the images, the technician ascribed coarse ratings for participants on the composite, seven-point domination and mutualism scales. Later, two individuals intimately familiar with the study's objectives and background (the primary investigator and a colleague, hereafter referred to together as 'investigators') studied the video-recorded interviews and independently coded responses for each interview (see data analysis section below for more detail on coding procedures). Each investigator also assigned the interview an overall score on each WVO scale. Although classifying participants as being high or low on the WVO scales was relatively straightforward, determining the magnitude of each WVO was more subjective but informed by the frequency, consistency, and strength of statements made during the interviews that were reflective of particular perspectives. Once scores were assigned for each WVO, participants were classified into WVO types using the four-group typology and corresponding analysis procedures from prior WVO research (Teel & Manfredi, 2009; Teel et al., 2010). Rating the interviews in this manner allowed for comparisons with the other three methodologies, while simultaneously drawing upon the richness and depth allowed by qualitative data collection. This method was pretested on several colleagues prior to data collection for clarity and flow of discussion prompts.

The **stories** methodology used video-recorded one-on-one interviews soliciting information about participants' prior experiences regarding wildlife. This methodology also took advantage of the universality of emotions across cultures (Tanaka & Osgood, 1965), asking participants to detail the emotions felt during the experiences they recalled. This approach replicated the work of Dayer and colleagues (2007), using the prompts 'Please share with me experiences with wildlife that make you happy [repeated using other emotions of: sad, angry, or afraid]. If needed, respondents were probed further using 'Can you give a more detailed

description of what happened?’ or ‘Do you have another example of this?’ In the absence of prior direct experience with wildlife, the technician prompted for an imagined experience, a story experienced by someone else, or an experience had through media that may have elicited one of the four emotions discussed (see Appendix H for full protocol). After discussing the stories regarding wildlife, the technician ascribed coarse ratings for participants on the composite, seven-point domination and mutualism scales. Later the investigators studied the video-recorded interviews and independently coded responses for each interview, consistent with the approach used for the photos methodology. Also consistent with this approach, each investigator assigned the interview an overall score on each WVO scale and classified participants into WVO types. Because our technique deviated little from prior research, including the work of Dayer et al. (2007), this method was not pretested.

In the final approach to WVO assessment, the **self-ID** methodology, participants received a written description of two hypothetical individuals intended to be strongly archetypical of the domination and mutualism WVOs (Table 8). The description of each archetype was developed based on similar verbiage of items from the survey battery as well as descriptions of WVOs and accounts of empirical findings regarding corresponding attitudes/behaviors appearing in prior literature (Manfredo et al., 2009; Teel & Manfredo, 2009). Participants were then asked, for each archetype, to respond on a seven-point scale to three questions assessing the extent to which they agreed, related to, or identified with the archetype. The three questions were tested for scale reliability using Cronbach’s alpha and combined into mean composite scales (one for domination and one for mutualism) to determine WVOs. Individuals who identified with only one archetype were classified as either Mutualists or Traditionalists. Participants who identified strongly with both archetypes were classified as Pluralists, and participants who did not identify with either

archetype were categorized as Distanced. This method was pretested on several colleagues prior to data collection for clarity and ease of comprehension.

In addition to measuring WVOs using the four methodologies detailed above, data on other variables, including acculturation and demographics, were collected. Acculturation was measured using the Short Acculturation Scale for Hispanics, valued for its brevity and demonstrated reliability (Marin, Sabogal, Marin, Otero-Sabogal, & Perex-Stable, 1987). Demographics of interest included gender, age, birth country, length of residency inside and outside of the U.S., income (1=<10k, 2=10-25k, 3=25-35k, 4=35-50k, 5=50-75k, 6=75-100k, 7=100-150k, 8=150-200k, 9=200k+), education (1=<GED, 2=GED, 3=2-year degree, 4=4-year degree, 5=advance degree), and how many generations one's family has lived in the U.S.

### **Data Analysis**

The two qualitative-based methodologies, photos and stories, were analyzed using emergent coding, both to ascertain the WVOs of participants as well as identify common themes and issues relating to how Latinos interact with wildlife and their natural surroundings more generally<sup>9</sup>. During coding, phrases indicative of a particular WVO were identified, and reoccurring themes were documented. To standardize, the investigators openly discussed the coding of the first few interviews, but assigned WVO scale scores independently.

Pearson's correlation was used to compare WVO scale scores resulting from the four different methodologies. Although all correlations are displayed in tables linked to the results section, the preponderance of discussion will focus on the comparison of the survey to other

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<sup>9</sup> Sufficiently addressing how WVOs revealed by the qualitative interviews compared to those resulting from other methodologies *and* thoroughly examining the richness of data on how Latinos interact with wildlife and nature could not be adequately accomplished in a single manuscript. Therefore, in line with our purpose here, this manuscript focuses primarily on the comparison of WVO assessment methods, with less attention given to the full breadth of findings resulting from the qualitative interviews which will likely be the focus of a future paper.

methodologies. We justify this decision based on our interest in evaluating the survey's applicability to the Latino population as well as its long-standing primacy in WVO literature.

Additional comparisons were made in which the 7-point WVO scales were dichotomized at the 4.5 midpoint, the same cut-off used to classify participants into WVO types. For these analyses, a tetrachoric correlation (Cohen, 1983; Vaske, 2008) was performed to determine how the methodologies compared in their classification of participants into types. In this way, while the Pearson's correlation analyses indicate how the four methodologies compare in their measurement of domination and mutualism using the raw WVO scales, the tetrachoric correlations are an indication of how each methodology compares in its categorization of individuals into WVO types.

Items in the acculturation scale were tested for reliability using Cronbach's alpha and subsequently combined into an overall mean composite (5-point agree/disagree scale with 1=identifying more with Latino culture, 5=identifying more with Caucasian culture). The midpoint of the acculturation scale (3=identifying with both cultures about equally) was used as a cut-off to categorize participants into groups of 'higher' (acculturation levels higher than the midpoint) versus 'lower' (less than or equal to the midpoint) acculturation. Within each group, comparisons of WVO scores resulting from the four methodologies were performed using procedures described above to examine the role of acculturation in influencing these results. All statistical analyses were conducted using SPSS/PASW 18.0.

## **Results**

The average stories interview lasted 12.6 minutes, with the longest lasting 22.7 minutes and the shortest 6.4 minutes. The average photos interview lasted 18.8 minutes, with the longest lasting 37.8 minutes and the shortest 10.8 minutes. The order of WVO assessment procedures

did not have an appreciable effect on results. Of the 58 participants, 40 completed all four methodologies; however, time constraints prevented 18 participants from completing the photos interview. Results of the quantitative methodologies, including the survey (domination [ $\alpha=0.80$ ], mutualism [ $\alpha =0.86$ ]) and self-ID (domination [ $\alpha=0.97$ ], mutualism [ $\alpha =0.91$ ]), revealed sufficient WVO item reliability.

Similarly, the inter-rater reliability between the two investigators on the photos (domination [ $r=0.90$ ], mutualism [ $r=0.84$ ]) and stories methodologies (domination [ $r=0.93$ ], mutualism [ $r=0.67$ ]) were acceptably high, thus scores were averaged across investigators to produce mean composite scales. To quantify WVOs from these qualitative techniques each investigator coded individual phrases and, after considering the interview in aggregate, assigned a score on each WVO scale as described above. Phrases demonstrative of the domination WVO included: “If I had to lay him out, I’d probably have to skin him and probably barbeque him” (C-059) and “[I think the Department should] stop selling tags for a year so there will be more to hunt next year” (C-055), each highlighting a utilitarian view of wildlife. Coded phrases attributable to the mutualism WVO included: “He’s carrying [the deer depicted in the photo], giving him love, that’s what he needs” (B-029); “I would like to hold a baby deer; to comfort it” (A-002), and “This animal wouldn’t be here [seeking human aid] if it weren’t hungry” (B-046), exemplifying the view of wildlife as companions, deserving of rights and caring. Some comments during the interviews were simultaneously representative of both WVOs, suggesting a Pluralist perspective. The following phrase offers an example, highlighting the context-specific nature of participants’ reactions in some cases: “We should only trap [wildlife] if it is outside of its environment” (B-041). Another instance of this was revealed in a participant’s preference to hunt big game over doves because he did not care to hurt smaller animals (B-044), again

demonstrating a willingness to place the needs of humans over those of wildlife, but only under certain circumstances. Additionally, participants who demonstrated both WVOs strongly, but not necessarily concurrently, were placed into the Pluralist category. One participant expressed enthusiasm for hunting, identifying himself as a sport hunter, but later lamented the loss of a mountain lion to its family when hit by a car, as well as the wildlife suffering caused by the British Petroleum Deepwater Horizon oil spill (A-022; [beginning in April, 2010]). Some participants did not demonstrate characteristics strongly indicative of either WVO, and in certain instances expressed a sense of fear toward wildlife, suggesting they belonged to the Distanced type. Key phrases exemplifying this type included: “[Animals] were nice to see from far away, but not close up. I just prefer them to stay where they are, just stay in their habitat. As long as they don’t come near me” (B-045). Further examples included: “I’m afraid of pigs ‘cause I read *Lord of the Flies* [in high school]” (B-031); and “[the picture] reminds me of *Duck Hunt* [the 1984 video game]” (C-060), exhibiting a general disassociation with wildlife (or nature more generally) such that the participant needed to recall more distal experiences when prompted by the technician’s stimulus.

### **Comparison of the Four Methodologies for WVO Assessment**

Average scoring on the mutualism WVO scale across methodologies was as follows: 5.13 for the survey, 5.44 for the self-ID, 4.54 for the stories, and 4.58 for the photos. Domination scale averages were 4.49 for the survey, 3.47 for the self-ID, 4.14 for the stories, and 4.15 for the photos. For the domination scale, individual scoring determined by the survey correlated (statistically significantly at a level of at least  $p < 0.05$ , unless stated otherwise) with that of the self-ID ( $r = 0.44$ ), the photos ( $r = 0.71$ ), and the stories ( $r = 0.58$ ) methodologies. For the mutualism scale, survey scores correlated with those of the self-ID ( $r = 0.55$ ), the photos ( $r = 0.25$ ), and the

stories ( $r=0.22$ ) (Table 9). The self-ID had the weakest correlations with other methods, lacking significance with the photos method for the domination scale and with the stories method for the mutualism scale. Results of the two qualitative methods tended to be more associated with each other than with the other quantitative methodologies. Generally, the correlations for the domination WVO were stronger among the four methodologies than were the correlations for the mutualism WVO (Table 9).

When the WVO scales were dichotomized to compare categorizations into WVO types, findings from the survey were strongly correlated with those of the self-ID technique ( $\rho=0.64$ ), the photos ( $\rho=0.73$ ), and the stories ( $\rho=0.58$ ) on the domination scale. Similarly, for mutualism, the survey results were correlated with those of the self-ID ( $\rho=0.65$ ), the photos ( $\rho=0.10$ ), and the stories ( $\rho=0.47$ ) (Table 10). With few exceptions, the tetrachoric correlation was stronger than the Pearson's correlation, suggesting that each method examined here more reliably and consistently categorized participants into WVO types than it quantified the WVOs of individuals. The most notable exception was found for the self-ID method, which tended to underrepresent the Distanced category and over represent the Mutualists, as compared to results of other methodologies. Another departure from equivalence was found in comparing results of the stories and photos methods, which were nearly identical except that the photos methodology placed 8% more participants into the Mutualist type and 8% less in the Pluralist type. Also notable was that the survey categorized slightly more participants as Pluralists (Figure 3).

### **Comparison of Results in the Context of Acculturation**

Acculturation of the participant affected the correlations used to compare the different methodologies on WVO score assessment (Table 11). Specifically, for scoring on the domination WVO scale, the photos and stories methods had higher correlations with other methodologies

within the low-acculturation participant category. However, this same trend was not detected among low-acculturation participants for the mutualism scale. Also worth mentioning was the higher correlation found between scoring on the photos and self-ID methods among the higher-acculturated participants. Overall, participants with higher acculturation levels had higher correlations between methodologies for the mutualism scale (Table 11).

## **Discussion**

The intention of this research was to compare various methodologies for quantifying WVOs, to determine the extent traditional survey methods adequately captured WVOs within Latino communities, and to explore what effects, if any, acculturation may have on WVO measurement. To accomplish this, we used four methods to measure WVOs, including a traditional survey, a method wherein participants self-identify their own WVOs, a method soliciting emotions induced by photos, and a method consisting of interviews eliciting recollections of participant experiences. These inquiries help advance the application of WVO theory (Manfredo et al., 2009; Teel & Manfredo, 2009) by testing a set of techniques in a new cultural context as well as confirming each of these methodologies can gainfully be used for quantifying WVOs, contingent upon research goals. This work also contributes to an accumulating body of knowledge about various methodologies that can be used to obtain information regarding human-wildlife relationships (see, for example, Champ, 2002; Deruiter & Donnelly, 2002; Dayer et al., 2007; Manfredo et al., 2009; Teel & Manfredo, 2009; McCoy, 2011; Thomas, 2012).

We begin this section by summarizing what we perceive to be important advantages of each methodology, as well as reviewing factors to consider when selecting among these methods for future research. The survey method is advantageous because it has been extensively tested in



multiple contexts and was shown to have high item reliability among Latinos in this study. The survey is able to go beyond simply detecting a particular orientation and instead may more readily capture (in a quantitative sense) the *magnitude* of each WVO, it is less reliant on researchers' subjective determinations of scale scores, and the results are generalizable to a population. However, the tradeoff to these advantages is the general limitations inherent in quantitative surveys (e.g., nonresponse biases, rigidity in responses, potentially superficial treatment of topics, etc.). In addition, the wording of the items may be difficult to translate to other languages in cross-cultural investigations. Most prior WVO research has been conducted via mail survey or in-person interviews; however, as phone, online, and other forms of survey data collection become more conventional we recommend an easier to execute 5-point scale rather than the current 7-point scale common in prior research. If longitudinal studies or comparisons to other geographic areas or populations are the research goal, the survey may still be among the preferred methodologies to consider, particularly given that measurement error at the individual level grows less important as sample size increase.

Within the quantitative methodologies, the self-ID method may be advantageous because of its reliance on participant (as opposed to researcher) selections and its straightforward approach to measurement; although the inherent simplicity may also be a limitation of this approach. With the 14-item survey battery, the true intent of the measurement is more obscured; whereas with the self-ID method participants may strategically or unintentionally bias their responses. Within our study, for example, participants may have felt compelled to identify with at least one of the hypothetical archetypes, even though the two descriptions were presented separately and participants had the option to indicate a lack of affiliation with either/both types. This may have created a scenario wherein there was a reduced possibility of being classified into

the Distanced type, and findings did reveal a lower percentage of participants in this category relative to the other methodologies. In future research using the self-ID method, we recommend trying to separate the presentation of the two archetypes and continued use of the 3-item scale. Alternatively, if raw WVO measures are not needed and WVO types are the focus of the research, the two archetypes may be presented together and the question posed: ‘Do you relate/identify with the first person, the second person, both, or neither one?’ In this way, the participants are self-identifying into one of the four WVO types. In spite of the drawbacks, the self-ID method shows promise, particularly for research aiming to simply detect the presence or absence of WVOs, obtain a coarse quantification of WVOs, and/or where response time is a limiting factor. Because of the greater divergence of the self-ID method results from those of the remaining methodologies, it is not recommended to routinely use this approach when a complex or refined analysis of WVOs is desired.

The photos method, given that it entails a qualitative approach, yields the benefit of a richer understanding of WVOs and wildlife-related attitudes of the participant (McCoy, 2010). It also demonstrates validity by comparing the participant’s WVO scores to verbatim responses to stimuli. As an example of this validity, participant A-003, a 33-year old woman assigned to the Mutualist type, described the satisfaction she derived from feeding squirrels around her home, occasionally referring to them as hers (behaviors and attitudes characteristic of Mutualists). Another participant, B-039, a 67-year old man assigned to the Pluralist type recalled with fondness salmon fishing, killing prairie dogs for compensation, and hunting cottontail rabbits, but also strongly objected to the image of a coyote in a leg-hold trap (suggesting the acceptability of killing an animal is contingent on circumstances, a quintessential Pluralist approach). The congruity of WVOs and attitudes associated with wildlife-related issues suggests convergent

validity of the photos methods. The drawbacks to the photos method include that it is time consuming, more subjective in that it relies on researchers' interpretations and scale score assignments, and results may vary if images other than the ones currently in use are utilized. The correlations for this method were not as strong as anticipated, which may have occurred because, due to time constraints, not every participant saw every photograph. Additionally, we found it was challenging for some participants to relate to the photos on an emotional level. As a minor adjustment, to potentially improve the approach for future use, we recommend adapting the prompt "How does this picture make you feel?" to "How do you feel about what is being shown in this photo?" to isolate the attitude object to the subject matter rather than the composition of the scene. This updated prompt may also be advantageous in the Spanish translation because it takes advantage of linguistic cognates (i.e., *fotografía* vs. *photograph*) that have common etymologies. Another recommendation for possible improvement would be in how the photos are presented. In this study, as well as others (McCoy, 2010), photos were presented in the fixed order as they appear in Figure 2. Another approach may be to have an adaptive order of photo presentation beginning with more neutral photos to allow for an initial exploration of the individual's perspectives, and then showing other photos, depending on initial responses, to determine if other orientations can be detected. Employing the photos methodology may be beneficial in cultures where surveys are not logistically possible, for situations involving illiterate populations, or when the richness inherent in qualitative analysis is desired. The photos methodology could also be beneficial to determine the presence of WVOs in a culture or to inform future quantitative research to be conducted in new cultural contexts.

The stories methodology has many of the same benefits, but also disadvantages, of the photos methodology, although supplemental materials are not needed and the research therefore

can be done impromptu if required. The comparability of this method to other methodologies may be diminished if a participant's lack of knowledge or lack of direct experience with wildlife is erroneously misinterpreted as an absence of WVOs. As an example, participant C-060, a 19-year old woman, had very little direct experience with wildlife and had a difficult time discussing wildlife in response to the four primary emotion prompts. This may have initially indicated she was uninterested in wildlife-related issues (a characteristic of a Distanced individual), yet later in the interview she was able to discuss at length the emotions she felt while watching *Bambi*, *Animal Planet*, *Planet Earth*, and *Whale Wars*. To overcome this potential error, we recommend allowing enough time in the interview for several follow-up prompts, such as probing regarding emotions felt from interacting with media, hearing experiences from others, and hypothetical experiences the participant would like to have. An additional complication arising during the stories methodology was that experiences were recalled from a broad range of all life stages, spanning many decades for some respondents. Because WVOs are interwoven with fundamental life values, they are theorized to be relatively stable within individuals across time, yet empirical evidence to fully warrant this assertion is lacking. Future studies exploring the constancy or maturation of WVOs within a person would be a fruitful area of investigation. In the stories methodology, if slight variations in WVOs or the prioritization of those WVOs change throughout one's lifetime, this evolution may confound the findings, particularly if some experiences are recent and some are in the distant past. One potential solution to this confounding effect would be to request the participant limit his/her experiences to only the more recent past. This method is recommended for similar research scenarios as mentioned above for the photos approach. Additionally, this method may be used when qualitative data are desired from visually-impaired participants.

Although each of the four methodologies contained herein was distinct in its advantages and disadvantages, there was still high congruity among the methods with respect to their categorizations and overall conclusions. Generally, the tetrachoric correlations (used to compare how methods categorize participants into WVO types) were stronger than the Pearson's correlations (used to compare how methods quantify raw WVO scale scoring). We hypothesize this improvement in correlations is likely due, at least in part, to the investigators simply needing to identify the appropriate valence (*direction* from the midpoint on each scale), rather than the magnitude of the WVO (*distance* from the midpoint on each scale). This finding confirms the intuitive conclusion that regardless of methodology, it may be easier to detect the presence or absence of a WVO than it is to quantify the magnitude of the respective WVO. Nevertheless, the correlations were strengthened to a higher degree for the mutualism scale than for the domination scale. This may indicate the magnitude of mutualism is more difficult to precisely measure but the ease of its detection (in terms of presence or absence) is similar to that of the domination WVO. Additionally, it is worth noting in this context that the lower correlation between the survey method and the photos method may have been attributable to the smaller sample size, as 18 participants did not complete the photos portion of WVO assessment.

In the context of this study, the reliability of the survey instrument and the correlation of survey results with those of other methodologies lend credence to the hypothesis that the quantitative survey may be used cross-culturally within Latino communities. Yet, caution should be employed when attempting to apply our results to other areas given that our research was conducted within a specific geographic context and also that no participant in our study chose to use the Spanish version of the survey. Furthermore, acculturation, which was shown by our research to affect the comparability of WVO assessment procedures, should be taken into

account when selecting the appropriate study methodology. Typically, the more acculturated participants had scores that were more consistent, as shown by the stronger correlations, across methodologies. This may be attributable to a higher degree of familiarity or experience with surveys among the more acculturated individuals. Also, the Latino culture may have certain social norms that encourage the censoring or tempering of opinions before expressing them (Auger, Decoster, & Colindres, 2008), which may change with acculturation to U.S. culture.

### **Implications and Suggestions for Future Research**

The demonstrated comparability of quantitative and qualitative methodologies shown by this investigation augments previous WVO research conducted within various cultural contexts (see *Human Dimensions of Wildlife*, v. 12, issue 5), and, in particular, may provide further justification for the use of WVO theory and these procedures in Latino communities, including in other parts of the U.S. These findings also lay additional groundwork for WVO measurement among other diverse audiences within conglomerate cultures. With few exceptions (e.g., McCoy, 2010), the current literature has not thoroughly examined WVOs within subsets of a broader culture. This study augments previous research in an effort to examine the heterogeneity that exists within diverse audiences of a composite society. Finally, this research also may be used as the underpinnings of future investigations applying WVO theory to Latin American countries.

In addition to its theoretical contributions, this research has applied implications for agencies and their conservation efforts. Chiefly, agencies may use this research to have increased flexibility in capturing the wildlife-related interests of a broader constituency. Elasticity in the methods of public engagement will gradually become more vital as the U.S. continues to diversify in terms of cultural heritage and wildlife-related activity preferences. Furthermore, as wildlife is increasingly recognized as an international resource and wildlife-related issues

become more global in nature, valid methods of quantifying WVOs and related cognitions across cultures will become more critical to inform management decisions at broader scales.

Replication of this research with diverse audiences in other contexts and over time is recommended to achieve a richer understanding of WVOs and appropriate measurement options across cultures. Future research of this nature could benefit from further exploration of how diverse audiences interact with the methodologies we explored, particularly the survey instrument, as prior literature suggests minority populations may be less likely to participate in studies employing traditional survey techniques (Bruyere et al., 2009; Shavers, Lynch, Burmeister, 2002; Martinez-Ebers, 1997). In an effort to address the potential limitations of quantitative approaches among these audiences, additional research is needed on qualitative methods for WVO assessment, building upon the techniques presented here as well as those employed in prior research on human-wildlife and human-nature relationships (e.g., Egan et al., 1995; Champ, 2002; Deruiter & Donnelly, 2002; Dayer et al., 2007; McCoy, 2010; Thomas, 2012).

Repeating this type of study could also be beneficial to negate the effects of possible limitations or external confounds that may have played a role in our investigation. Immediately preceding this study, for example, the Arizona legislature proposed immigration legislation (Senate Bill 1070), wherein a person could be detained if they were unable to provide documentation of legal status. Although participants were assured that this research was not interested in their legal status, and questions regarding their legal status were not asked, there was an initial apprehension. This anxiety may have caused some individuals to decline participation or may have altered the responses of those who did participate, if they felt they needed to censor their opinions. Another confounding externality was the April 22, 2010 British

Petroleum Deepwater Horizon oil spill, a then-recent issue involving natural resources and wildlife that had broad media coverage. Regardless of their WVOs, many participants were upset with the damage the oil spill was inflicting on wildlife, and they expressed concern for the individual wildlife seen through the media. This concern for the wellbeing of individual animals is a mutualistic trait, and the magnitude and salience of the oil spill event may have evoked characteristically mutualistic comments that may not have otherwise been expressed in its absence. A final possible limitation worth considering in relation to future research involves strategies for participant recruitment. For this study, participants were obtained using a Spanish surname sample as well as relying on existing databases of people who self-identified as Latinos in prior investigations conducted by the research firm. Although useful as a starting point and for reducing research costs, a potential limitation could be that the sample we obtained may not fully represent the entire spectra of Latino communities in the study area. Other techniques should be explored for obtaining representative samples of Latinos and other diverse audiences.

Beyond replicating and expanding this research, it would be valuable to pursue additional analyses of existing data collected through this investigation. In particular, our research generated a rich volume of qualitative data that is informative in understanding how Latinos relate to wildlife, and the natural environment more generally, as well as their wildlife-related recreation preferences. A content analysis of these data to explore the emergent themes could generate many meaningful conclusions. Undoubtedly, there is much to learn about how humans interact with wildlife and their environment, and WVO theory is a promising approach to improve understanding. Agencies and academia alike will hopefully benefit from the findings presented herein when selecting a methodology to examine WVOs within diverse audiences, and for use in other cross-cultural research.



Table 6 A four-group typology of Wildlife Value Orientations (adapted from Teel et al., 2010)

Mutualism	High	<p><b>Mutualists.</b> Have a mutualism orientation, viewing wildlife as capable of relationships of trust with humans, as if part of an extended family, and as deserving of rights and caring. They are less likely to support actions resulting in death or harm to wildlife, more likely to engage in welfare-enhancing behaviors for individual animals, and more likely to view wildlife in human terms.</p>	<p><b>Pluralists.</b> Have both a mutualism and a domination value orientation toward wildlife. The influence of the two value orientations is believed to be situationally contingent, meaning that which of the orientations plays a role is dependent upon conditions of the given issue or situation (Tetlock, 1986). For certain issues, Pluralists are likely to respond in a manner similar to that of Traditionalists, whereas for other issues they may behave more like Mutualists.</p>
	Low	<p><b>Distanced.</b> Do not have either a mutualism or a domination orientation. As their label suggests, they tend to be less interested in wildlife and wildlife-related issues.</p>	<p><b>Traditionalists.</b> Have a domination orientation, believing that wildlife should be used and managed primarily for human benefit. They are more likely to prioritize human well-being over wildlife in their attitudes and behaviors. They are also more likely to find justification for treatment of wildlife in utilitarian terms and to rate actions that result in death or harm to wildlife as acceptable.</p>
		Low	High
Domination			

Table 7 Survey items and reliability results for wildlife value orientation and their respective belief dimensions.

Wildlife Value Orientation, basic belief dimension, and basic belief item <sup>1</sup>	Cronbach's $\alpha$
Domination Wildlife Value Orientation	0.80
Appropriate Use Beliefs	0.67
Humans should manage fish and wildlife population so that humans benefit	
The needs of humans should take priority over fish and wildlife protection	
Fish and Wildlife are on earth primarily for people to use	
Hunting Beliefs	0.81
We should strive for a world where there's an abundance of fish and wildlife for hunting and fishing	
Hunting is cruel and inhumane to animals <sup>2</sup>	
Hunting does not respect the lives of animals <sup>2</sup>	
People who want to hunt should be provided the opportunity to do so	
Mutualism Wildlife Value Orientation	0.86
Social Affiliation Beliefs	0.86
We should strive for a world where humans and wildlife and fish can live side by side without fear	
I view all living things as part of one big family	
Animals should have rights similar to the rights of humans	
Wildlife are like my family and I want to protect them	
Caring Beliefs	0.65
I care about animals as much as I do other people	
I feel a strong emotional bond with animals	
I value the sense of companionship I receive from animals	

<sup>1</sup> Item response scale: 1 (strongly disagree) to 7 (strongly agree)

<sup>2</sup> Item was reverse coded prior to analysis

Table 8 Reliability result for the Wildlife Value Orientation measurement from the Self-Identification method within Latino communities

Wildlife Value Orientation and individual belief item <sup>1</sup>	Cronbach's $\alpha$
<b>Domination archetype description:</b>	
<i>This person feels that humans have dominion over wildlife, and it should be used and managed for human benefit. This person believes that wildlife exists for human use and enjoyment. This person feels there is an abundance of wildlife for hunting and fishing, and would like to manage wildlife so that humans benefit. This person feels that the needs of humans are more important than the needs of wildlife.</i>	
I mostly agree with the views of this person <sup>1</sup>	
I relate to this person <sup>1</sup>	
I generally tend to think like the person described above <sup>1</sup>	0.97
<b>Mutualism archetype description:</b>	
<i>This person feels that humans and wildlife should co-exist or live in harmony. This person believes that humans and animals depend upon each other and that they benefit one another in their relationship. This person views companionship with animals as very important, and wishes there were never any animal suffering. This person feels that animals have rights similar to humans and are part of an extended family. This person feels that animals are deserving of our care.</i>	
I mostly agree with the views of this person <sup>1</sup>	
I relate to this person <sup>1</sup>	
I generally tend to think like the person described above <sup>1</sup>	0.91

<sup>1</sup> Item response scale: 1 (strongly disagree) to 7 (strongly agree)

Table 9 Pearson correlation matrix of quantitative and qualitative measurement of wildlife value orientations within Latino communities

Domination WVO	Reliability	1	2	3	4
1. 14-Item Battery	0.80 <sup>1</sup>	--			
2. Self-Identification	0.97 <sup>1</sup>	0.44 <sup>**</sup>	--		
3. Photo	0.90 <sup>2</sup>	0.71 <sup>**</sup>	0.21	--	
4. Stories	0.93 <sup>2</sup>	0.58 <sup>**</sup>	0.41 <sup>**</sup>	0.72 <sup>**</sup>	--
Mutualism WVO					
1. 14-Item Battery	0.86 <sup>1</sup>	--			
2. Self-Identification	0.91 <sup>1</sup>	0.55 <sup>**</sup>	--		
3. Photo	0.84 <sup>2</sup>	0.25	0.35 <sup>*</sup>	--	
4. Stories	0.67 <sup>2</sup>	0.22 <sup>*</sup>	0.19	0.42 <sup>**</sup>	--

<sup>1</sup> Reliability of Cronbach's A

<sup>2</sup> Correlation of inter-rater reliability

\* Correlations are significant at  $p < 0.05$

\*\* Correlations are significant at  $p < 0.01$

Table 10 Tetrachoric correlations of quantitative and qualitative measurement of Wildlife Value Orientations within Latino communities

Domination WVO	Reliability	1	2	3	4
1. 14-Item Battery	0.80 <sup>1</sup>	--			
2. Self-Identification	0.97 <sup>1</sup>	0.64 <sup>**</sup>	--		
3. Photo	0.97 <sup>2</sup>	0.73 <sup>**</sup>	0.15 <sup>**</sup>	--	
4. Experiences	0.93 <sup>2</sup>	0.58 <sup>**</sup>	0.33 <sup>**</sup>	0.84 <sup>**</sup>	--
Mutualism WVO					
1. 14-Item Battery	0.86 <sup>1</sup>	--			
2. Self-Identification	0.91 <sup>1</sup>	0.65 <sup>**</sup>	--		
3. Photo	0.96 <sup>2</sup>	0.10 <sup>**</sup>	0.59 <sup>**</sup>	--	
4. Experiences	0.80 <sup>2</sup>	0.47 <sup>**</sup>	0.45 <sup>**</sup>	0.40 <sup>**</sup>	--

<sup>1</sup> Reliability of Cronbach's  $\alpha$

<sup>2</sup> Tetrachoric correlation of inter-rater reliability

\* Correlations are significant at  $p < 0.05$

\*\* Correlations are significant at  $p < 0.01$

Table 11 Pearson's Correlations of wildlife value orientation measurement methodologies for Latino respondents with lower and higher acculturation levels

	Lower Acculturation				Higher Acculturation			
	1	2	3	4	1	2	3	4
<b>Domination</b>								
1. 14-Item Battery	--				--			
2. Self-Identification	0.54	--			0.42	--		
3. Photo	0.81	0.19	--		0.67	0.23	--	
4. Story	0.74	0.60	0.77	--	0.53	0.34	0.71	--
<b>Mutualism</b>								
1. 14-Item Battery	--				--			
2. Self-Identification	0.61	--			0.54	--		
3. Photo	0.27	-0.32	--		0.25	0.49	--	
4. Story	0.29	0.12	0.38	--	0.21	0.12	0.43	--

Photograph 1



Photograph 2



Photograph 3



Photograph 4



Photograph 5



Photograph 6



Figure 2 Photographs used to qualitatively assess wildlife value orientations in the photos methodology section (from McCoy, 2010)

Photograph 7



Photograph 8



Photograph 9



Figure 2 continued. Photographs used to qualitatively assess wildlife value orientations in the photos methodology section (from McCoy, 2010)



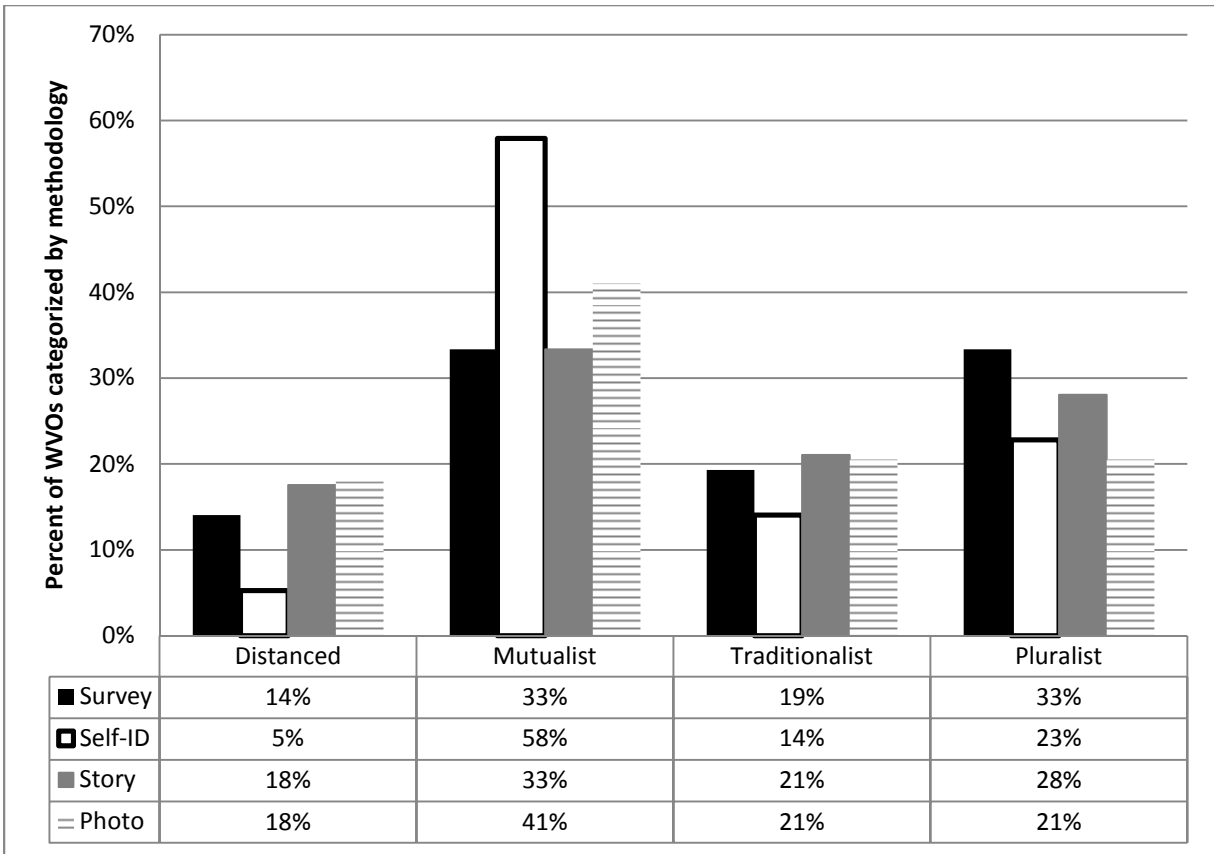


Figure 3- Percentage of wildlife value orientation type by measurement methodology

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#### IV. WILDLIFE VALUE ORIENTATIONS ACROSS GENERATIONS: EVIDENCE FOR A CROSS-TEMPORAL SHIFT

##### **Executive Summary**

Modernizing forces such as urbanization, diffusion of affluence, broader educational opportunities, and the growth of technology are changing the context of wildlife conservation in the United States. Concurrent with modernization is a value shift that is altering the way people perceive and interact with wildlife, specifically increasing the egalitarian perception that wildlife may serve as potential companions capable of trusting relationships with humans and deserving of rights and caring. This value shift, in concert with other socioeconomic forces, is thought to be the fundamental cause of declines in hunting and fishing participation. Despite its salience to wildlife management agencies, the nature of the value shift and how to continue conservation efforts while accommodating a changing constituency needs further investigation. We used a meta-analysis to contribute to improved understanding in this area by measuring wildlife value orientations (WVOs) and analyzing results in relation to year of birth. WVOs were found to vary significantly by birth year, with more nascent citizens tending to be mutualistic (perceiving wildlife in egalitarian terms, as potential companions capable of relationships of trust), and older individuals generally more domination oriented (view of wildlife that prioritizes human wellbeing over wildlife and treats wildlife in utilitarian terms). This differential in the way people perceive wildlife suggests agencies may want to consider engaging each generation differently, according to how they relate to the resource. For example, messages designed to appeal to a mutualism WVO may resonate more strongly with the Millennial generation, whereas domination-oriented messages may be more appealing to early Generation X and late Baby

Boomers. These findings may assist agencies as they continue to engage broader constituencies and attempt to remain salient to younger generations.

Keywords: human dimensions, hunter recruitment and retention, Public Trust, value shift, wildlife value orientations.

## **Introduction**

Now, perhaps more than in any other point in history, state wildlife agencies (agencies) are being fiscally and politically challenged by changing societal conditions. In the past, agencies conserved hunted and non-hunted wildlife species using monies generated largely from the sale of hunting and fishing licenses and excise taxes on related equipment. However, in recent decades, the decline in hunting, fishing, and other consumptive forms of wildlife-related recreation (U.S. Fish & Wildlife Service, 2007; Chase, 2012), has led to concerns about the ability of agencies to secure a stable source of funding to support wildlife conservation in the future. At the same time, there has been growth in other forms of wildlife-related recreation, such as wildlife viewing (U.S. Fish & Wildlife Service, 2007; Chase, 2012). Although valuable to residents' quality of life and for gaining political support from non-traditional constituencies, these activities generate little immediate revenue for agencies and may strain already-constricted budgets. Tied to these trends is the changing nature of public interests that demand a say in how wildlife are managed, which corresponds to different preferences for wildlife-related programs and services (Manfredo, Teel, & Henry, 2009; Teel & Manfredo, 2009). Greater diversity in viewpoints has contributed to increased interpersonal conflict, as well as social values conflict among stakeholders (Madden, 2004). Furthermore, agencies acting as stewards of public resources are having difficulty adequately representing the divergent interests of stakeholders

and have increasingly endured challenges to their authority through mechanisms such as ballot initiatives and public referenda (Minnis, 1998).

In response to these trends, agencies are attempting to diversify to a system that is germane to a wider constituency, while simultaneously exploring ways to bolster their traditional hunter/angler-based business model. To become salient to a broader audience not interested in hunting or fishing, agencies have tried to offer new agency programs and services (e.g., wildlife viewing opportunities) designed to appeal to emerging interests whose values may not be reflected in wildlife-related activities conventionally promoted by agencies. Clients of these new services may bring divergent opinions from those of traditional agency patrons, many of whom have, by convention, grown up hunting and fishing (Organ & Frizell, 2000). The long-term success of these efforts is challenged by the lack of stable funding mechanisms as well as agency reluctance to embrace change given the historical dependence of the agencies upon hunting and fishing for revenue as well as the agency culture that has formed around these traditions (Gill, 1996; Organ & Frizell, 2000).

To improve the effectiveness of agency efforts aimed at maintaining support from long-established stakeholders and embracing emerging publics, there is a need for theoretical frameworks to serve as a foundation to better comprehend audiences with diverse wildlife-related interests and how those audiences may be changing as a result of modernization. One such framework is wildlife value orientation theory (Manfredo et al., 2009; Teel & Manfredo, 2009), which builds upon concepts from social psychology to augment understanding of the various types of cognitions that shape human behavior in a wildlife-related context. Using this theory as a foundation, we set out to explore how discrete generations may perceive wildlife



differently and to pinpoint the implications of this for improved understanding of how agency publics may be changing.

### **Wildlife Value Orientations**

Wildlife value orientation (WVO) theory draws upon the cognitive hierarchy or value-attitude-behavior model of Homer and Kahle (1988) in which individual behavior is guided by a series of interrelated cognitions arranged in a hierarchical fashion. At the base of this hierarchy are values, which are broad, enduring beliefs (Rokeach & Ball-Rokeach, 1989; Schwartz, 2006). These values influence the formation of attitudes, which are defined as the association of an evaluation and an object (e.g., an issue, an entity, another person, a behavior) in memory (Ajzen & Fishbein, 1980). Values are held in common by individuals of a given culture (Inglehart & Welzel, 2005), so their ability to predict attitudes within cultures is limited (Bright, Manfreda & Fulton, 2000). Value orientations are “networks of basic beliefs that organize around values and provide contextual meaning to those values in relation to a particular domain such as wildlife” (Teel & Manfreda, 2009, p. 129). Specifically, wildlife value orientations (WVOs) are reflective of ideologies that play an important role in shaping individuals’ wildlife-related behaviors and attitudes toward issues dealing with wildlife treatment (Manfreda et al., 2009).

Research has documented two primary WVOs representing how different people relate to wildlife, a domination orientation and a mutualism orientation (Manfreda et al., 2009; Teel & Manfreda, 2009). Individuals with a domination orientation believe the needs of humans supersede those of wildlife and perceive wildlife as a resource to be managed for the benefit of humans. They generally hold attitudes more favorable to actions involving utilitarian treatment of wildlife (e.g., hunting, lethal control) and are more likely to exhibit behaviors such as hunting and fishing. Individuals with a mutualism orientation believe wildlife are deserving of caring and

rights similar to humans and view wildlife as potential companions capable of relationships of trust. They are less likely to support actions resulting in death or harm to wildlife and more likely to appreciate wildlife through wildlife viewing or photography and to engage in behaviors that benefit individual animals such as feeding.

### **Modernization and its Effects on WVOs**

Previous research has suggested a gradual shift away from domination to mutualism WVOs in the western United States that is attributable to forces of modernization (Manfredo et al., 2009). Modernization is the process by which a society becomes more affluent, educated, urbanized, and technologically complex (Abramson & Inglehart, 1995; Inglehart, 1997). Associated with this process is industrialization, which contributes to greater aggregate national wealth while increasingly specialized work provides salaries capable of financing the pursuit of leisure activities (Cordell et al., 2004). Technically advanced jobs tend to congregate people into urbanized areas, facilitating access to broader educational opportunities. This increase in wealth, technology, urbanization, and education significantly changes the life experiences, and by extension the life values of modernized citizens.

Life values are determined largely by the circumstances of one's upbringing, including the needs he or she is trying to satisfy during those formative years (Inglehart, 1997). Individuals trying to meet basic physiological needs while maturing are more likely to exhibit Materialist values later on in life that emphasize economic and physical security; whereas those concerned with higher-order needs including belongingness, self-esteem, and self-actualization have a greater tendency to express Postmaterialist values as adults that emphasize aesthetics, self-expression, and quality of life (Inglehart, 1997). Across time, as a country becomes more modernized or industrialized, the youth within the population undergo vastly different

experiences as compared to their predecessors. Inglehart (1997) theorized that as the percentage of individuals with Materialist values decreases relative to the percentage of individuals with Postmaterialist values, the result would be a gradual, cross-generational value shift. This argument has been supported by empirical findings over time stemming from the World Values Survey (Inglehart & Welzel, 2005). Although this modernization pattern is not deterministic, meaning that the conditions of a given society are critical in defining the nature of change that occurs, the probabilistic nature of modernization theory makes it useful for anticipating future challenges stemming from changing values surrounding wildlife and its conservation.

Given its significant effects on daily life circumstances in this country, modernization is arguably having an impact on how people think about and relate to wildlife. Support for this argument was provided by a recent 19-state study conducted in the western U.S. (Manfredo et al., 2009) which demonstrated: (1) an empirical connection between WVOs and Inglehart's (1997) values measures; and (2) the influence of state-level modernization variables (income, education, urbanization) on the composition and distribution of WVOs throughout the region. While data were cross-sectional in nature, they revealed patterns consistent with the hypothesis that modernization, similar to its effect on life values, is contributing to a gradual shift away from domination toward mutualism WVOs. Our interest, with the current investigation, was to add to this body of prior knowledge by examining the WVOs of different generations whose early life experiences, defined in part by societal conditions, may have given rise to different ways of viewing the wildlife resource.

### **Study Purpose**

We used WVO theory as a conceptual framework to examine how constituencies born in different time periods may relate to wildlife in divergent ways, expecting that the younger

generations would have more mutualistic perspectives toward wildlife. As discussed above, prior research has laid a foundation for our examination by proposing a general shift in WVOs (Manfredo et al., 2009), and additional research would help validate and extend the conclusions of this prior work. It would also contribute to improved ability to anticipate future scenarios of change in public thought regarding wildlife by identifying the WVOs of younger generations who are expected to soon become a more predominant force in U.S. society. Practical benefits of this type of investigation would also include contributions to agency communication and outreach efforts by providing information helpful for tailoring messages for different generational audiences.

### **Methods**

Data for this investigation were obtained from three surveys previously conducted in Arizona in September 2010 ( $n=1,103$ ), November 2010 ( $n=1,165$ ), and January 2012 ( $n=643$ ). While each survey had distinct objectives, each sample was generalizable to the adult population of Arizona. Surveys were pre-tested and then administered by phone using random-digit dialing with multiple contact attempts spread across various time periods. To aid in ensuring representativeness, samples were stratified by age, gender, and geographic location commensurate to the population. Following data collection, samples were verified against the 2010 U.S. Census and were shown to vary little from population parameters on key demographic measures.

All three surveys (hereafter referred to as the ‘survey’) contained an identically-worded battery of 14 belief items used previously for WVO measurement (Table 12; Manfredo et al., 2009; Teel & Manfredo, 2009; McCoy, 2010). The four-item hunting belief dimension and the three-item appropriate use of wildlife belief dimension were combined into a mean composite

scale representing the domination WVO (on a 7-point agree/disagree scale, with the higher values being more strongly representative of the WVO). Analogously, the four-item social affiliation belief dimension and the three-item caring belief dimension were combined into a mean composite scale representing the mutualism WVO. Reliabilities were determined using Cronbach's alpha, and when sufficiently high (Cortina, 1993), survey items were aggregated into mean composite scales. We also categorized respondents into WVO types (Table 13) using an approximate median split (4.5 to standardize with other research) on the domination and mutualism scales (Teel & Manfreda, 2009; Teel et al., 2010).

Mean values for the domination and mutualism WVOs were calculated for all respondents within the same birth year. To illustrate the relationship between birth year and WVOs, we applied a smoothing factor, created by averaging the WVO scales of each birth year with the two adjacent birth years. Smoothing factors are used frequently with time-series data in economics, and the approach used here is analogous to simple moving averages used in stock market technical analysis to smooth fluctuations of shorter periods and emphasize long-term trends. The smoothed data for each WVO was then plotted against birth year for examination. For analysis at the generational level, respondents were segregated into Prewar, Baby Boomer, Generation X, and Millennial generations using the breakpoints of 1945, 1965, and 1980, respectively (Howe & Strauss, 1991). We used an analysis of variance (ANOVA) to determine if the four generations had different WVOs and then used Student-Newman-Keuls post-hoc testing to compare the four generations on each WVO scale. Finally, we performed a chi-square test to ascertain if different generations varied on the basis of percentages classified into the four WVO types. The Statistical Package for the Social Sciences, SPSS/PASW 18.0 was used for all statistical analyses, and statistical significance was designated at a level of  $p < 0.05$ .

## Results

Consistent with prior research (Manfredo et al., 2009; Teel & Manfredo, 2009), aggregate scales for the domination ( $\alpha=0.71$ ) and mutualism ( $\alpha=0.83$ ) WVOs demonstrated acceptable reliability (Table 12). Mean scoring on mutualism and domination scales was found to vary by birth year as depicted in figure 4. Because WVOs vary in ways that are nonlinear to birth year, this relationship is analyzed below in terms of generations, yet much can be learned from a descriptive analysis (*en sensu* Cohen, 1994). Descriptively, the domination WVO score was approximately 0.25 points higher (on the 7-point scale) for respondents born prior to the early 1940's when compared to other surrounding birth years. Those born between the mid-1950's and the early 1980's were also approximately 0.25 points higher (compared to other surrounding birth years) on the domination scale, with the exception of a five-year bracket of individuals born in the late 1960's. The domination WVO scoring was highest for the age group born from the mid to late 1970's; however scores on the domination scale were lower for those born in the early 1980's and thereafter. On the mutualism WVO scale, respondents born between the mid-1940's and mid-1950's tended to score higher than those in other adjacent birth years. However, those born in the late 1950's through the late 1970's scored lower on the mutualism scale. Interestingly, the group born in the late 1960's, which tended to have lower averages on the domination scale, also had higher mutualism scores. The most dramatic deviation in WVO scoring was the one-point increase in mutualism for respondents born after approximately 1980, indicating that this group of individuals perceives wildlife significantly differently than its predecessors.

Variability in WVOs across time was also evident from comparisons for which the continuous variable of birth year was converted into the categorical variable of generation. The

Prewar, Baby Boomer, and Millennial generations had higher mutualism scores than Generation X, which was approximately one-third of a point lower on the mutualism scale, significantly lower as indicated through Student-Newman-Keuls post-hoc testing ( $F_{3,2173}=6.09, p=0.03$ ; Table 14; Figure 5). Though post-hoc testing did not indicate the Millennial generation was significantly different from the Prewar and Baby Boomer generations, the true nature of the divergence between these generations may have been somewhat obscured by the variation *within* the Millennial generation (i.e., Millennials born in the early 1980's were fairly low on the mutualism scale as compared to those born close to 1990 who had the highest mutualism score of any birth year examined). On the domination scale, post-hoc tests revealed no statistical difference between the Baby Boomer and Prewar generations. Generation X had the highest average domination score, and Millennials had the lowest, a significant difference of about one-fifth of a point ( $F_{3,2180}=3.00, p \leq 0.001$ ). The drop in mutualism and concurrent rise in domination scoring for those born around 1970 (as revealed in comparisons by birth year described earlier) was not manifested when analyzing WVOs across generation categories. Although the effect sizes for mutualism ( $\eta=0.09$ ) and domination ( $\eta=0.07$ ) in the latter analysis were considered minimal (Vaske, 2008), they may have been constrained by such variations detected within generational categories and they may not be indicative of the true practical significance.

Differences in WVOs across generations were also reflected in the analysis of WVO types by generational membership ( $\chi^2=25.11, p=0.003, \phi_c =0.11$ ; Figure 6). The percent of Distanced individuals ( $\bar{x} = 4.1\%-5.9\%$ ) was minimal, regardless of generation. In contrast, the Pluralist type ( $\bar{x} = 43.4\%-47.8\%$ ) was the largest group for all generations, with the Prewar generation having a slightly higher percentage than other generations, though the increase was

not statistically significant. A higher percentage of the Millennial generation was represented by the Mutualist type (28%), and a higher percentage of Generation X consisted of Traditionalists (32%) when compared to other generations.

### **Discussion**

The overall objective of this research was to explore how constituencies born during various time periods may relate to wildlife in different ways. Prior research has demonstrated a connection between age and WVOs (e.g., Zinn, 2003; Teel & Manfredro, 2009) as well as the impact of age on wildlife-related recreation (Spence, 2002, Chase, 2012) and public reactions to specific wildlife-related issues (Dwyer, 1994). Our investigation contributes to and expands this prior work by allowing for a detailed observation of the variation in WVOs across birth years, and by extension across generations, which has implications for WVO theory as well as for wildlife conservation efforts.

According to WVO theory, the societal conditions present during one's formative years affect how people think about and interact with wildlife as adults (Manfredro et al., 2009). Additionally, according to this theory and supported by a recent 19-state investigation in the western U.S. (Manfredro et al., 2009; Teel & Manfredro, 2009), forces of modernization (e.g., rising income, education, urbanization) are believed to be driving an intergenerational shift from domination to mutualism WVOs. Our findings are consistent with this argument, indicating that participants born more recently, particularly after 1980, are more mutualistic. Further, findings suggest that as the more domination-oriented Prewar and Baby Boomer generations begin exiting the population and subsequent generations become increasingly more predominant, the complexion of our society has the potential to grow markedly more mutualistic, if WVOs are constant across lifespans. This societal shift may be particularly challenging for agencies that are



mandated to manage wildlife in the public trust and that obtain a large portion of their revenue from the sale of hunting and fishing licenses, activities that are associated with the waning domination WVO.

Simultaneously, our findings may support an alternative hypothesis that WVOs develop over time within individuals through a ‘maturation’ process. This hypothesis suggests there is a progression to the development of WVOs, namely, that younger individuals tend to be more mutualistic, and as they mature may become more domination-oriented in their view of wildlife. There may be challenges to agencies’ ability to conserve wildlife under this scenario as well, as the largest proportion of hunters and anglers will perpetually be centered between the mid-forties and mid-fifties in age. This narrowed timeframe of participation would potentially restrict wildlife conservation revenues to a small portion of the constituency in perpetuity, if WVOs in fact go through a ‘maturation’ process. Although the ‘societal shift’ hypothesis detailed above is more in line with WVO theory and prior research, the data from this investigation could support both postulations. In light of this ambiguity, there is a clear need for further research into the nature of how WVOs develop and change or remain stable at the individual and societal levels.

In the interest of maintaining conservation revenue and social relevancy amidst the aforementioned challenges, agencies will need to continue to simultaneously focus their attention on maintaining traditional customers as well as engaging new constituencies. Maintaining traditional customers may be partially accomplished through hunter/angler recruitment and retention initiatives specifically targeting cohorts identified herein who tend to have WVOs more receptive to domination-oriented messages and activities. Though the long-term efficacy of recruitment and retention programs is largely undocumented, these programs may be a more immediate, provisional solution while agencies seek a palatable mechanism wherein all citizens

who benefit from wildlife contribute to its perpetuation. In the effort of engaging new constituencies, agencies would also do well to target messages to the upcoming Millennial generation. While Millennials are more mutualistic than previous generations, they could be engaged with wildlife through non-consumptive wildlife-related activities, such as wildlife viewing or photography. Agencies will need to diversify their offerings to reach this upcoming group, adding targeted messaging and advertising to encourage participation.

Interestingly, we found that Generation X had the highest percentage of Traditionalists, even more so than the Prewar and Baby Boomer generations. While they show more affiliation with the domination WVO, a smaller percentage of this cohort participates in consumptive forms of wildlife-related recreation as compared to earlier generations (Chase, 2012, unpublished data). Agencies therefore may consider tailoring their messaging to target this generational group of individuals, as there may be evidence of a latent demand for hunting and fishing. Media sources known to have a large contingent of viewers or followers from Generation X could be considered as an avenue for advertising efforts for this purpose.

While significant variations in WVOs across generations were evident in our research, these findings also suggest that typical generational classifications (Howe & Strauss, 1991) may not have sufficient resolution in matters related to wildlife. The Millennial generation, in particular, is an example, as the true nature of the divergence between this generation and others may have been somewhat obscured by the variation *within* the Millennial generation. Those born in the early 1980s had WVOs more reflective of Generation X, while those born after 1990 went significantly up in scoring on the mutualism scale. It might not be enough for agencies to consider generations as a whole when interacting with their constituencies; rather, agencies may

need to also recognize the variation within groups, particularly with respect to the Millennial generation.

Although this investigation offers insight into how WVOs may vary across and within generations, and it poses several practical implications, we recommend additional research examining WVOs in relation to birth year across time as well as other geographical contexts. In particular, research duplicated in other geographies with different levels of modernization would be valuable to determine if the same trends found for Arizona, a relatively modernized (and more mutualist; Teel et al., 2005) state, can be detected. Temporally, a replication of this research could offer additional clarification on whether WVOs go through a ‘maturation’ process or if there is a true shift altering the complexion of society’s WVOs. Distinguishing between these two competing scenarios is important as the societal shift hypothesis would require broader efforts on behalf of agencies in order to prepare for the future. As most wildlife agencies largely depend on revenue derived from hunting and fishing either scenario directly affects their fiscal resiliency and, by extension, their wildlife conservation efforts overall. Because governmental entities may be slow to change and lack the agility to timely react to conditions, advanced planning to ameliorate these declines in revenue is necessary to minimize future losses and ensure wildlife conservation can be sustained.

Table 12 Survey items and reliability results for wildlife value orientations and their respective belief dimensions from an aggregation of studies from 2010 and 2011 conducted in Arizona ( $n=2,911$ ).

Wildlife Value Orientation items <sup>1</sup>	Cronbach's $\alpha$
Domination Wildlife Value Orientation	0.71
Appropriate Use Beliefs	0.56 <sup>2</sup>
Humans should manage fish and wildlife populations so that humans benefit	
The needs of humans should take priority over fish and wildlife protection	
Fish and wildlife are on earth primarily for people to use	
Hunting Beliefs	0.76
We should strive for a world where there's an abundance of fish and wildlife for hunting and fishing	
Hunting is cruel and inhumane to animals <sup>3</sup>	
Hunting does not respect the lives of animals <sup>3</sup>	
People who want to hunt should be provided the opportunity to do so	
Mutualism Wildlife Value Orientation	0.83
Social Affiliation Beliefs	0.78
We should strive for a world where humans and wildlife and fish can live side by side without fear	
I view all living things as part of one big family	
Animals should have rights similar to the rights of humans	
Wildlife are like my family and I want to protect them	
Caring Beliefs	0.69
I care about animals as much as I do other people	
I feel a strong emotional bond with animals	
I value the sense of companionship I receive from animals	

<sup>1</sup> Item response scale: 1 (strongly disagree) to 7 (strongly agree)

<sup>2</sup> This reliability is lower than desirable; however, the reliability of this scale is established in prior literature. The reliability of the domination scale is also acceptable.

<sup>3</sup> Item was reverse coded prior to analysis

Table 13 A four group typology of Wildlife Value Orientations (adapted from Teel et al., 2010)

Mutualism	High	<p><b>Mutualists.</b> Have a mutualism orientation, viewing wildlife as capable of relationships of trust with humans, as if part of an extended family, and as deserving of rights and caring. They are less likely to support actions resulting in death or harm to wildlife, more likely to engage in welfare-enhancing behaviors for individual animals, and more likely to view wildlife in human terms.</p>	<p><b>Pluralists.</b> Have both a mutualism and a domination value orientation toward wildlife. The influence of the two value orientations is believed to be situationally contingent, meaning that which of the orientations plays a role is dependent upon conditions of the given issue or situation (Tetlock, 1986). For certain issues, Pluralists are likely to respond in a manner similar to that of Traditionalists, whereas for other issues they may behave more like Mutualists.</p>
	Low	<p><b>Distanced.</b> Do not have either a mutualism or a domination orientation. As their label suggests, they tend to be less interested in wildlife and wildlife-related issues.</p>	<p><b>Traditionalists.</b> Have a domination orientation, believing that wildlife should be used and managed primarily for human benefit. They are more likely to prioritize human well-being over wildlife in their attitudes and behaviors. They are also more likely to find justification for treatment of wildlife in utilitarian terms and to rate actions that result in death or harm to wildlife as acceptable.</p>
		Low	High
		Domination	

Table 14 An ANOVA with Student-Newman-Keuls post-hoc tests on two WVOs across four generations of Arizonans (n=2,911).

	Generation				<i>F</i>	P
	Prewar	Baby Boomer	Gen X	Millennial		
Mutualism	5.21 <sup>a</sup>	5.15 <sup>a</sup>	4.92 <sup>b</sup>	5.28 <sup>a</sup>	6.09	0.03
Domination	5.13 <sup>a,b</sup>	5.07 <sup>a,b</sup>	5.23 <sup>b</sup>	5.01 <sup>a</sup>	3.00	<0.001

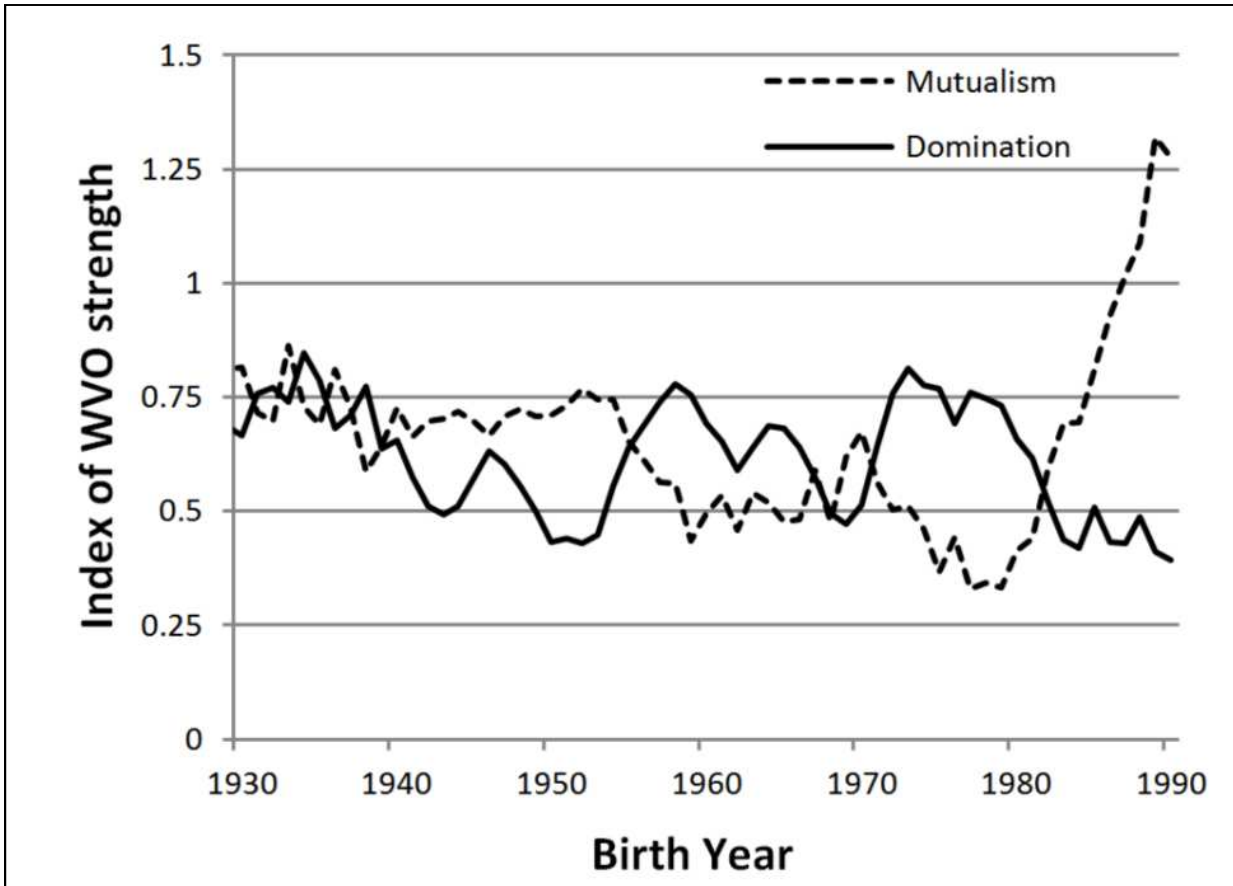


Figure 4 Wildlife value orientations of Arizonans according to birth year. The index of WVO strength on the Y axis is the distance above the midpoint (4.5 on a 7-point scale) of each WVO scale.

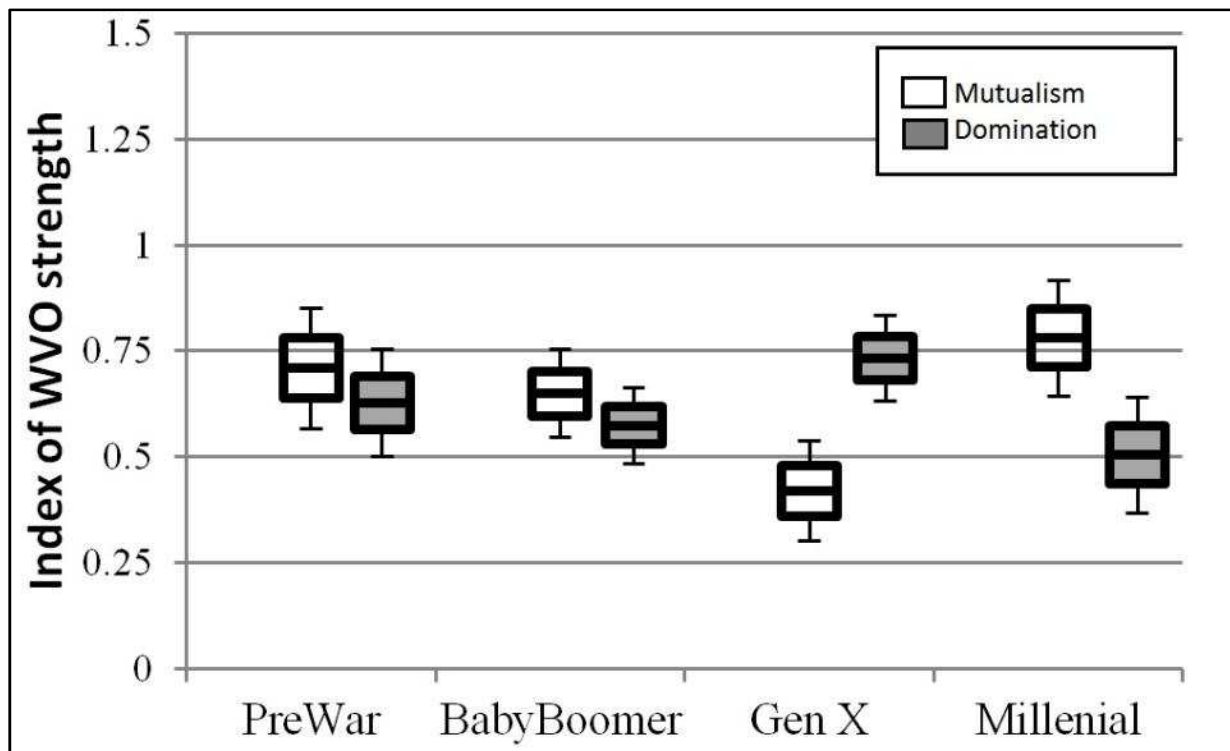


Figure 5 Wildlife value orientations of Arizonans according to generational membership. The index of WVO strength on the Y axis is the distance above the midpoint (4.5 on a 7-point scale) of each WVO scale.



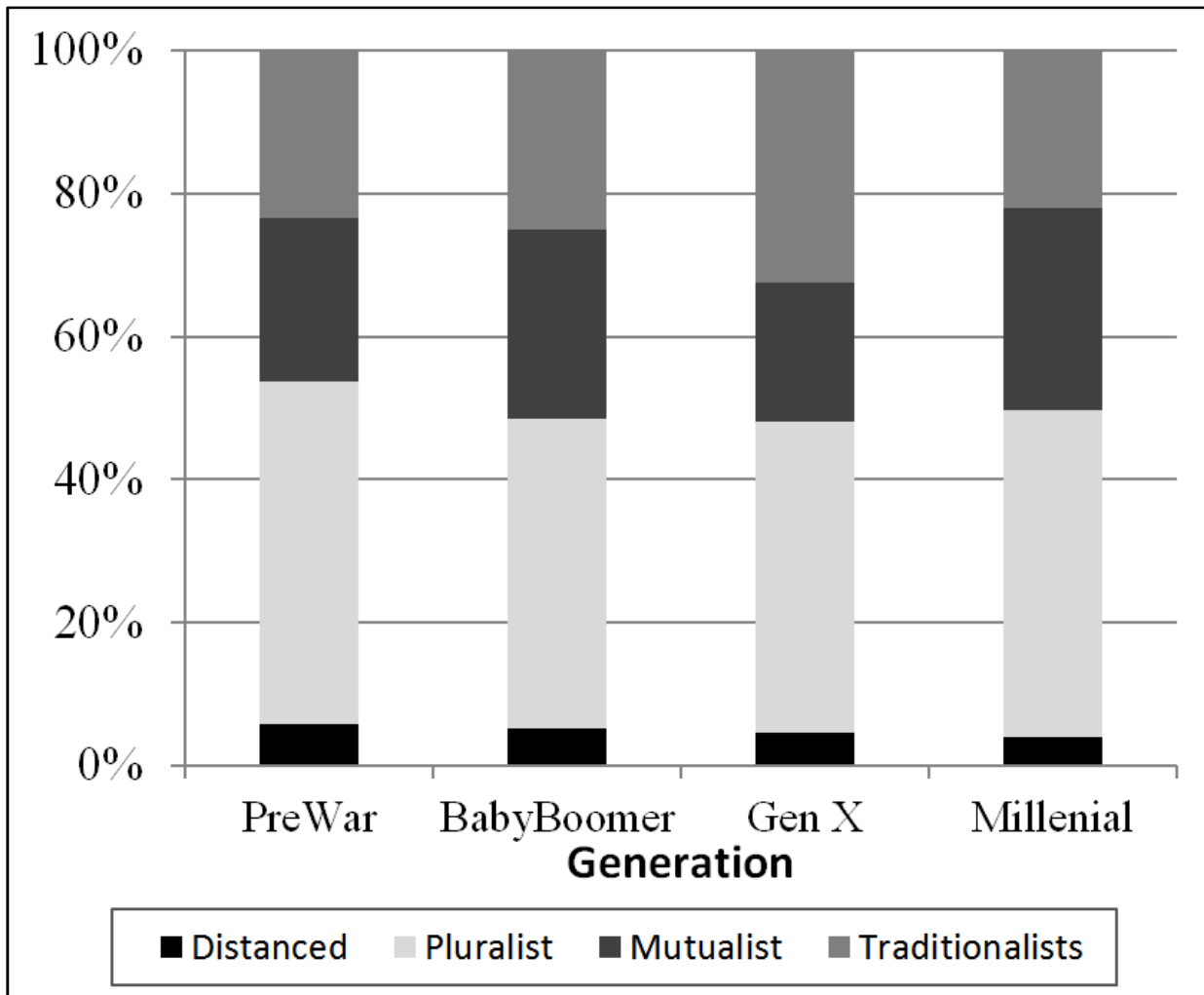


Figure 6 Composition of four generations according to wildlife value orientation type. Sample from three data collection efforts within the general population of Arizona ( $n=2,911$ ).

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## V. CONCLUSION TO THE DISSERTATION

This dissertation was intended to advance social science theory as it applies to wildlife and natural resource-related topics as well as assist wildlife conservation organizations in understanding the diverse spectrum of perspectives regarding wildlife within their constituencies. This diversity in perspectives and wildlife-related interests may be understood through a framework of wildlife value orientations (WVOs). This theory provides a lens through which human-wildlife interactions (including human-human interactions about wildlife) can be considered and interpreted by those charged with wildlife conservation. For this cause, as well as in an effort to promulgate WVO theoretical underpinnings, we tested the robustness of WVO applications under varying conditions. Specifically, we examined WVOs across three different spectra: culture, methodology, and generations. This investigation contributes to expanding WVO applications by exploring different concepts from WVO theory in a previously-understudied population: Latinos in the American Southwest. By examining the WVOs of diverse audiences in this way we can enhance knowledge of cross-cultural differences in WVOs, as well as elucidate factors that may affect WVO shift (Teel, Manfredo, & Stinchfield, 2007). This cross-cultural knowledge comes through understanding the macro (Modernization Theory, explored extensively in Chapter II and tangentially in Chapter IV) and micro (cognitive hierarchy theory of human behavior, also examined in Chapter II) portions of the WVO theoretical model (Manfredo & Dayer, 2004; Manfredo & Teel, 2008). Different approaches to measurement were discussed in Chapter III to consider mechanisms for WVO assessment in diverse groups and to facilitate cross-cultural comparisons. An additional contribution to WVO theory was made in Chapter IV in the context of understanding how different generations, maturing during time periods with different societal conditions, perceive and relate to wildlife in

divergent ways,. Ultimately, in addition to its theoretical contributions, this dissertation has the practical purpose of providing wildlife agencies with information useful in exploring ways to more adequately represent and garner support from underserved publics.

### **Summary and Integration of Findings**

Chapter II explored possible differences and similarities in the way Latinos and Caucasians interpret their relationship and interactions with wildlife. This interpretation, as measured by WVOs, was compared to other levels of cognition such as life values, wildlife-related attitudes, subjective norms, and behavioral intentions. Findings indicated that Latinos perceive wildlife differently than Caucasians, as Latinos generally tended to be more mutualistic and less domination-oriented in their WVOs. However, there was significant heterogeneity within Latino communities; in particular, Latinos who were less acculturated were more mutualistic, and more acculturated individuals tended to trend more toward the domination WVO. Additionally, within our findings, WVOs and other wildlife-related cognitions correlated in the manner anticipated (Manfredo et al., 2009; Homer & Kahle, 1988), offering evidence for the predictive validity of the WVO concept within Latino communities.

Chapter III introduced and tested a mixed-methods approach for measuring WVOs among Latinos. As agencies increasingly manage wildlife for constituencies of diverse cultural backgrounds, it raises questions about the potential limitations of traditional quantitative methodologies for understanding those constituencies, including their WVOs. In the interest of addressing this concern we examined WVOs in Latino communities in the American Southwest using four methods: a 14-item survey, a self-identification approach, a qualitative method involving life experiences with wildlife, and a methodology investigating emotional reactions to wildlife-related images. The standard quantitative survey methodology was found to be generally

reliable among Latinos. The survey was also generalizable to larger populations and portable to compare between populations, however it is subject to the rigidity of research design, nonresponse bias, and superficiality in treatment of the WVO concepts. The self-identification method was straightforward and relied on participant involvement, but its simplicity may be a shortcoming if refined or in-depth investigations of WVOs are needed. Both the stories and photos approaches yielded a rich understanding of the way people perceive wildlife and provided abundant internal validity, yet both were time consuming and may be subjective.

Chapter IV investigated how WVOs varied across generations of residents in Arizona, with results indicating that more recently-born individuals (e.g., the Millennial generation) were more mutualistic and older individuals (e.g., Prewar and Baby Boomer generations) were generally more domination-oriented. While prior research (e.g., Zinn et al., 2003; Teel & Manfredo, 2009) has found an association between age and WVOs, our investigation contributes to and expands this prior work by allowing for a detailed observation of the variation in WVOs across birth years, and by extension across generations, which has implications for WVO theory as well as for wildlife conservation efforts. Results are consistent with the notion that a *societal* shift in WVOs is occurring in the U.S. (Manfredo et al., 2009) and suggest that if WVOs within an individual are relatively constant, as generational replacement progresses the complexion of society may become more mutualistic. However, results may also support the possibility of WVOs being part of a developing process, wherein the WVOs of an *individual* mature over time, becoming more domination-oriented with age. While findings may be consistent with both a ‘societal shift’ as well as a ‘maturation’ hypothesis, the former postulation is more in line with WVO theory and prior research. In light of this ambiguity, there is a need for further research

into the nature of how WVOs develop and change or remain stable at the individual and societal levels.

### **Management Implications**

Overall, we found WVOs to be an appropriate and functional framework for examining people's perception of wildlife across cultures, methodologies, and generations. Natural resource professionals may conclude from these findings that Latinos perceive wildlife differently than do Caucasians. Additionally, the way younger generations interpret their relationship and interactions with wildlife is distinctive from prior generations. Because we noticed a significantly greater emphasis on mutualism for individuals born after 1980, to be more salient to the Millennial, and subsequent generations, agencies may need to custom tailor their messaging to be more appealing to the mutualistic worldview of these younger generations. Also, agencies now have at their disposal several options for WVO assessment, particularly as subcultures and different ethnicities begin playing a larger role in American society. In the face of the aforementioned shifting societal conditions, the long-term success of agencies is contingent upon their ability to reach and provide services for audiences that are diverse in terms of their cultural heritage, their generational membership, and their wildlife-related interests. Because of its robustness, WVO theory and its application are a well-suited mechanism to facilitate greater comprehension of the way people perceive wildlife in a way that transcends spatial, temporal, and contextual situations.



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## APPENDIX A: Survey Instrument for Latino wvo assessment

BEHAVIOR RESEARCH CENTER, INC.  
45 East Monterey Way  
Phoenix, AZ 85012  
(602) 258-4554

### LATINO WILDLIFE SURVEY

JOB ID 2011050

June 2011

Hello, my name is \_\_\_\_\_ and I'm with the Behavior Research Center of Arizona. We're conducting a study on outdoor recreation and wildlife management among Hispanic residents and I'd like to speak with you for a few minutes. Your opinions will be useful in helping to shape the direction of wildlife management efforts in Arizona.

A. Before we get started, are you 18 years of age or older?

**IF YES:** CONTINUE

**IF NO:** ASK TO SPEAK WITH OTHER PERSON 18 OR OLDER.  
RE-INTRODUCE YOURSELF AND CONTINUE.  
IF NOT AVAILABLE, ARRANGE CALLBACK.

Male...1  
Female...2

B. Which of the following categories best describes your age? (READ EACH)

Under 35...1  
35 to 49...2  
50 to 64...3  
65 or over...4

(THANK & TERMINATE) Refused

C. And do you consider yourself to be of Hispanic origin or descent?

**IF YES:** CONTINUE

**IF NO:** ASK TO SPEAK WITH OTHER HISPANIC 18 OR OLDER, RE-INTRODUCE YOURSELF AND CONTINUE.  
IF NOT AVAILABLE, ARRANGE A CALLBACK. IF NONE IN HOUSEHOLD, THANK AND TERMINATE.

Yes...1  
No...2

1. To begin, I'd like to read you a variety of statements about wildlife. As I do, please just tell me if you strongly agree, moderately agree, slightly agree, neither agree or disagree, slightly disagree, moderately disagree or strongly disagree with each. (ROTATE – REPEAT CATEGORIES AS NECESSARY)

	Strongly Agree	Moderately Agree	Slightly Agree	Neither	Slightly Dis- Agree	Moderately Dis- Agree	Strongly Dis- Agree	Not Sure
A. Humans should manage fish and wildlife population so that humans benefit .....	1	2	3	4	5	6	7	8
B. We should strive for a world where humans and wildlife and fish can live side by side without fear .....	1	2	3	4	5	6	7	8
C. We should strive for a world where there's an abundance of fish and wildlife for hunting and fishing .....	1	2	3	4	5	6	7	8
D. The needs of humans should take priority over fish and wildlife protection	1	2	3	4	5	6	7	8
E. I view all living things as part of one big family .....	1	2	3	4	5	6	7	8
F. Animals should have rights similar to the rights of humans .....	1	2	3	4	5	6	7	8
G. Wildlife are like my family and I want to protect them .....	1	2	3	4	5	6	7	8
H. Fish and wildlife are on earth primarily for people to use .....	1	2	3	4	5	6	7	8
I. Hunting is cruel and inhumane to animals .....	1	2	3	4	5	6	7	8
J. I care about animals as much as I do other people .....	1	2	3	4	5	6	7	8
K. People who want to hunt should be provided the opportunity to do so .....	1	2	3	4	5	6	7	8
L. I value the sense of companionship I receive from animals .....	1	2	3	4	5	6	7	8
M. Hunting does not respect the lives of animals .....	1	2	3	4	5	6	7	8
N. I feel a strong emotional bond with animals .....	1	2	3	4	5	6	7	8

2. Next, we're interested in knowing under what circumstances, if any you think it is acceptable for the Arizona Game and Fish Department to lethally remove wildlife, that is by killing the animal. For example, do you feel it is highly acceptable, acceptable, neither acceptable or unacceptable, unacceptable or highly unacceptable for the Arizona Game and Fish Department to lethally remove a coyote or bobcat under the following circumstances? (READ EACH – DONT ROTATE)

	Highly Acceptable	Acceptable	Neither	Unacceptable	Highly Unacceptable	Not Sure
A. If it is seen near your home .....	1	2	3	4	5	6
B. If it is a nuisance near your home. For example it gets into trash or damages landscaping .....	1	2	3	4	5	6
C. If it has a disease that may be spread to humans .....	1	2	3	4	5	6
D. If it attacks a pet near your home .....	1	2	3	4	5	6
E. If it attacks a person near your home .....	1	2	3	4	5	6

3. Next, do you strongly agree, agree, neither agree or disagree, disagree or strongly disagree with each of the following statements? (READ EACH - DO NOT ROTATE)

	Strongly Agree	Agree	Neither	Disagree	Strongly Disagree	Not Sure
A. Fishing is acceptable to me personally .....	1	2	3	4	5	6
B. Hunting is acceptable to me personally .....	1	2	3	4	5	6
C. Viewing wildlife is acceptable to me personally .....	1	2	3	4	5	6
D. I plan to go fishing in the future .....	1	2	3	4	5	6
E. I plan to go hunting in the future .....	1	2	3	4	5	6
F. I plan to view wildlife in the future .....	1	2	3	4	5	6
G. My family, friends and other people important to me would approve of me if I were fishing .....	1	2	3	4	5	6
H. My family, friends and other people important to me would approve of me if I were hunting .....	1	2	3	4	5	6
I. My family, friends and other people important to me would approve of me if I were viewing wildlife .....	1	2	3	4	5	6
J. I feel that maintaining order in the nation is more important than protecting freedom of speech .....	1	2	3	4	5	6
K. I feel that maintaining a high level of economic growth is more important than making our cities more beautiful .....	1	2	3	4	5	6
L. I feel that fighting rising prices is more important than giving people more to say in important government decisions .....	1	2	3	4	5	6
M. I feel that progressing toward a more humane society is more important than maintaining a stable economy .....	1	2	3	4	5	6
N. I feel that living in a society in which ideas count more than money is more important than fighting crime .....	1	2	3	4	5	6
O. I feel that making sure people having more say in how things are done at their jobs and their communities is more important than this country having strong defense forces .....	1	2	3	4	5	6

4. For my next questions, I'd like to find out a little about your use of Spanish and English. When responding to my questions please use the following categories – only Spanish, more Spanish than English, both equally, more English than Spanish or only English? (READ EACH – DO NOT ROTATE)

	Only Spanish	More Spanish Than English	Both Equally	More English Than Spanish	Only English	Not Sure
A. In general, what languages do you read and speak .....	1	2	3	4	5	6
B. What was the language you used as a child .....	1	2	3	4	5	6
C. What language do you usually speak at home .....	1	2	3	4	5	6
D. In which language do you usually think .....	1	2	3	4	5	6
E. What language do you usually speak with your friends .....	1	2	3	4	5	6
F. In what language are the T.V. programs you usually watch .....	1	2	3	4	5	6
G. In what language are the radio programs you usually listen to .....	1	2	3	4	5	6
H. In general, in what language are the movies, T.V. and radio programs you prefer to watch and listen to .....	1	2	3	4	5	6

5. Next, are your close friends all Latino, more Latino than white, about half and half, more white than Latino or all white?
6. Do you prefer going to social gatherings and parties at which people are all Latino, more Latino than white, about half and half, more white than Latino or all white?
7. Are the people you visit or visit you all Latino, more Latino than white, about half and half, more white than Latino or all white?
8. If you could choose your children's friends, would you want them to be all Latino, more Latino than white, about half and half, more white than Latino or all white?
9. Next, using a scale of 1 to 5, where 1 means not an issue at all and 5 means one of the biggest issues, how much of an issue would each of the following be in your decision whether or not to participate in an outdoor activity? (READ EACH – ROTATE, CODE DONT KNOW 6)

All Latino...1  
 More Latino than white...2  
 About half and half...3  
 More white than Latino...4  
 All white...5  
 Refused...6

All Latino...1  
 More Latino than white...2  
 About half and half...3  
 More white than Latino...4  
 All white...5  
 Refused...6

All Latino...1  
 More Latino than white...2  
 About half and half...3  
 More white than Latino...4  
 All white...5  
 Refused...6

All Latino...1  
 More Latino than white...2  
 About half and half...3  
 More white than Latino...4  
 All white...5  
 Not applicable – no kids...6  
 Refused...7

Rating

- A. Lack of time ..... \_\_\_\_\_
- B. The cost of the activity ..... \_\_\_\_\_
- C. A language barrier ..... \_\_\_\_\_
- D. Worry about discrimination ..... \_\_\_\_\_
- E. Lack of transportation ..... \_\_\_\_\_
- F. Not having anyone to go with ..... \_\_\_\_\_
- G. I don't know what activities are available ..... \_\_\_\_\_
- H. I don't know where to go ..... \_\_\_\_\_

10. Now before we finish, I need to ask you a few questions for classification purposes. First, how many years have you lived in Arizona? YEARS: / / /
11. Did you live in any other part of the United States prior to living in Arizona? (GO TO Q11a) Yes...1  
 (GO TO 12) No...2
- 11a. How many years did you live there? YEARS: / / /
12. Did you live in any other countries prior to living in Arizona? (GO TO 12a) Yes...1  
 (GO TO 13) No...2
- 12a. Which country did you live in?  
 \_\_\_\_\_
- 12b. How many years did you live there? YEARS: / / /
13. Where were you born? (RECORD COUNTRY, OR STATE IF OFFERED)  
 \_\_\_\_\_

14. Which one of the following statements best describes how many generations your family has been in the United States? (READ EACH EXCEPT REFUSED)
- I am the first person of my family to live in the United States...1
  - My parents or one of my parents were the first person of my family to live in the United States...2
  - My grandparents or one of my grandparents were the first person of my family to live in the United States...3
  - My great grandparents or one of my great grandparents were the first person of my family to live in the United States...4
  - My family has been in the United States longer than four generations...5
  - Refused...6
15. Do you consider your place of residence to be a... (READ EACH EXCEPT REFUSED)
- A large city or urban area...1
  - A suburban area...2
  - A small city or town...3
  - A rural area on a farm or ranch...4
  - A rural area NOT on a farm or ranch...5
  - Refused...6
16. And did you grow up in a... (READ EACH EXCEPT REFUSED)
- A large city or urban area...1
  - A suburban area...2
  - A small city or town...3
  - A rural area on a farm or ranch...4
  - A rural area NOT on a farm or ranch...5
  - Refused...6
17. What is the highest level of schooling you have had the opportunity to complete? (DON'T READ LIST)
- Not a high school graduate...1
  - High school graduate or equivalent...2
  - 2 year degree, Associate's degree or trade school degree...3
  - Bachelor's degree...4
  - Advanced degree...5
  - Refused...6
18. And finally, was your total family income for last year, I mean before taxes and including everyone in your household, under or over \$60,000?
- IF UNDER \$60,000
- Was it under \$20,000...1
  - \$20,000 to \$39,999 or...2
  - \$40,000 to \$59,999...3
  - (DO NOT READ) Refused...4**
- OVER \$60,000
- Was it under \$80,000...5
  - \$80,000 to \$99,999...6
  - \$100,000 to \$119,999 or...7
  - \$120,000 or more...8
  - (DO NOT READ) Refused...9**
- (DO NOT READ) Refused overall...10**

Thank you very much, that completes this interview. This information will be used by the Arizona Game and Fish Department to improve how they interact with Latino communities to help Latinos enjoy the wildlife of their state. My supervisor may want to call you to verify that I conducted this interview so may I have your first name so that they may do so? (VERIFY PHONE NUMBER)

NAME: \_\_\_\_\_ PHONE #: \_\_\_\_\_

FROM SAMPLE: \_\_\_\_\_ COUNTY: \_\_\_\_\_

ZIP CODE: \_\_\_\_\_

## APPENDIX B: Methodologies-Participant welcome and orientation

Room	Station	Group	6-6:40	6:40-7:20	7:20-8
102	Experiences	A	Experiences	Survey	Pictures
104	Pictures	B	Pictures	Experiences	Survey
106	Survey	C	Survey	Pictures	Experiences

**Protocol for host**

- 1) **Introduction-** *“Tonight we are studying people’s relationship with nature and wildlife. This information will help Arizona Game and Fish Department to provide better services you and the people of Arizona”*
- 2) **Verify they are on the list.** If we have less than 60 participants, people not on the list may participate, but they must wait in the lobby or outside until 6:10p to give people on the list a chance to show up. If we have more than 60 verified participants, extras may participate but will not be compensated for their time.
- 3) **We will go until 8:00p.** Guests and family members can return at that time. For safety reasons, children should not be allowed to roam unsupervised in the community center and is unacceptable. They will need to stay outside, go home, or stay with another adult supervisor.
- 4) **Unique ID’s.** Place Unique ID # next to name on sign in sheet. Point it out to participants on the folder.
- 5) **Nametag.** First name only on nametag, Unique ID # on nametag too.
- 6) **Folder.**
  - a) The folder is to collect documents from all three stations.
  - b) At the end of the night, they will need the folder, with documents, to get paid
  - c) Guarantee confidentiality; participation is voluntary
  - d) We will be recording, dismiss them if they object
  - e) Point out the order of the stations on the folder
- 7) **Priming.** Begin thinking about experiences that you have had about wildlife
- 8) **Logistics.**
  - a) The first 12 people showing up early should be placed in groups A (Experiences first) and B (pictures first). [that way interviewer are not waiting as participants are waiting] After 12, assign participants randomly. Once groups A and B have 20 participants each, fill group C until we have 20. After 60, participants will be assigned at random again.
  - b) The first 6 participants of Groups A and B should go directly to rooms 102 and 104 respectively. The remainder of Groups A and B should go to the waiting room (103) and placed in respective groups.
  - c) All participants placed in group C should go directly to room 106 (surveys) and we will start at 6:15 to let stragglers arrive and have one more person to direct traffic.

1 A 11 A 21 B 31 C 41 A 51 B  
 2 B 12 B 22 C 32 A 42 B 52 C  
 3 A 13 C 23 A 33 B 43 C 53 A  
 4 B 14 A 24 B 34 C 44 A 54 B  
 5 A 15 B 25 C 35 A 45 B 55 C  
 6 B 16 C 26 A 36 B 46 C 56 C  
 7 A 17 A 27 B 37 C 47 A 57 C  
 8 B 18 B 28 C 38 A 48 B 58 C  
 9 A 19 C 29 A 39 B 49 C 59 C  
 10 B 20 A 30 B 40 C 50 A 60 C

## APPENDIX C: Methodologies-Quantitative survey materials



Arizona  
Game & Fish  
Department

# A-001

## Attitudes about Wildlife & Fish

Thank you!

We are grateful for your participation in this study tonight. As a demonstration of our gratitude, we would like to compensate you for your time. Please accept this as a gift, from our partners at Behavioral Research Center.

Your identity and all information will be **confidential** and **not shared** with any other governmental agency or business. After we are finished with the study, we will write down your stories, remove all personal information, and destroy the recording to protect your identity.

We will ask you to share stories about wildlife. We will record them only because it is too difficult to capture the richness of the experience by taking notes. If you object to us recording your stories and comments, you may withdraw from the study at anytime.

To ensure that your time here is most advantageous, please do the following:

1. Keep this form with you at all times, you will need it frequently tonight, and you will need it at the end of the night
2. Begin thinking about experiences that you have had that involved wildlife, if you can't think of any, think of stories you have heard about wildlife, or television shows that you have seen that included wildlife
3. Go to the stations in the order instructed
4. Fill out forms and surveys completely
5. Make sure that your number in the box above is recorded at each station

You will visit three stations tonight in the following order:

1. A station where you will talk about experiences that you have had with wildlife
2. A station where you will take a survey about wildlife
3. A station where you will talk about pictures of wildlife

The information you provide will help our department perform better, and provide improved services to you. If you have any questions or concerns please feel free to contact the Primary Investigator, Loren Chase at [lchase@azgfd.gov](mailto:lchase@azgfd.gov) or at 623.236.7518.

5000 W Carefree Highway  
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#



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## Attitudes about Wildlife & Fish

The following information will help us understand your attitudes towards wildlife.

Do you disagree or agree with the following?	Strongly Agree	Moderately Agree	Slightly Agree	Neither	Slightly Disagree	Moderately Disagree	Strongly Disagree
Humans should manage fish and wildlife population so that humans benefit	1	2	3	4	5	6	7
We should strive for a world where humans and wildlife and fish can live side by side without fear	1	2	3	4	5	6	7
We should strive for a world where there's an abundance of fish and wildlife for hunting and fishing	1	2	3	4	5	6	7
The needs of humans should take priority over fish and wildlife protection	1	2	3	4	5	6	7
I view all living things are part of one big family	1	2	3	4	5	6	7
Animals should have rights similar to the rights of humans	1	2	3	4	5	6	7
Wildlife are like my family and I want to protect them	1	2	3	4	5	6	7
People should never be allowed to use any fish or wildlife for any reason	1	2	3	4	5	6	7
It is acceptable for people to kill wildlife if they think it poses a threat to their life	1	2	3	4	5	6	7
It is acceptable for people to kill wildlife if they think it poses a threat to their property	1	2	3	4	5	6	7
If I had to walk in the outdoors, I would be worried about encountering a wild animal	1	2	3	4	5	6	7
It is acceptable to use fish and wildlife in research even if it may harm or kill some animals	1	2	3	4	5	6	7
Fish and Wildlife are on earth primarily for people to use	1	2	3	4	5	6	7
If I were around wildlife in the outdoors I would be uncomfortable	1	2	3	4	5	6	7
Hunting is cruel and inhumane to animals	1	2	3	4	5	6	7
I have concerns about being around wildlife because they may carry disease	1	2	3	4	5	6	7
I am not interested in knowing anything more about fish and wildlife	1	2	3	4	5	6	7
It would be more rewarding to me to help animals rather than people	1	2	3	4	5	6	7



The following information will help us understand your attitudes towards wildlife.

<b>Do you disagree or agree with the following?</b>	<b>Strongly Agree</b>	<b>Moderately Agree</b>	<b>Slightly Agree</b>	<b>Neither</b>	<b>Slightly Disagree</b>	<b>Moderately Disagree</b>	<b>Strongly Disagree</b>
I have concerns about being around wildlife because they may hurt me	1	2	3	4	5	6	7
<b>I am really not that interested in fish and wildlife</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
Advances in technology will eventually provide a solution to our environmental problems	1	2	3	4	5	6	7
<b>I care about animals as much as I do other people</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
People who want to hunt should be provided the opportunity to do so	1	2	3	4	5	6	7
<b>I take great comfort in the relationships I have with animals</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
I value the sense of companionship I receive from animals	1	2	3	4	5	6	7
<b>The natural environment should be protected for its own sake rather than simply to meet our needs</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
Hunting does not respect the lives of animals	1	2	3	4	5	6	7
<b>I feel a strong emotional bond with animals</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
We should strive for a society that emphasizes environmental protection over economic growth	1	2	3	4	5	6	7
<b>Science can provide answers to any problems that we encounter in nature</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
Protecting the natural environment should be this country's top priority	1	2	3	4	5	6	7
<b>We can find solutions to environmental problems through science and technology</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>

Please list any comments or questions that you may have for us here:



Arizona  
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Department

## C-S-105

### Actitudes acerca de la Vida Silvestre y Pesca

Gracias!

Estamos muy agradecidos por su participación en este estudio esta noche. Como una muestra de nuestro agradecimiento, nos gustaría recompensarle por su tiempo. Por favor, acepte esto como un regalo, de nuestros socios de Behavior Research Center.

Su identidad y su información será **confidencial** y **no será compartida** con otras agencias gubernamentales o de negocios. Después de que termine con el estudio, vamos a escribir sus historias, eliminar toda la información personal, y destruir la grabación para proteger su identidad.

Le pediremos que compartan historias sobre la vida silvestre. Los vamos a grabar sólo porque es muy difícil captar la riqueza de sus experiencias, tomando notas. Si usted se opone a la grabación de sus historias y comentarios, puede retirarse del estudio en cualquier momento.

Para asegurar que su tiempo aquí es más valioso, por favor haga lo siguiente:

1. Guarde este documento durante el estudio por que lo necesitará con frecuencia, y también lo necesitará después del estudio.
2. Comience a pensar acerca de sus experiencias que ha tenido sobre la vida silvestre. Si usted no puede pensar de ninguna, piense en historias que han oído de la vida silvestre, o programas de televisión que usted ha visto que incluyó la fauna
3. Vaya a las estaciones en el orden instruido
4. Llene los documentos y el cuestionario completamente
5. Asegúrese de que su número en el cuadro arriba se registra en cada estación

Usted ira a tres estaciones esta noche en el orden siguiente:

1. Una estación en la que tomará una encuesta sobre la vida silvestre
2. Una estación en la que hablará sobre las fotos de vida silvestre
3. Una estación en la que hablará sobre las experiencias que ha tenido con la fauna silvestre

La información que usted proporcione ayudará a nuestro departamento de un mejor desempeño y ofrecer mejores servicios a usted. Si usted tiene alguna pregunta o comentario, contacte el investigador principal, Loren Chase en [lchase@azgfd.gov](mailto:lchase@azgfd.gov) o llame al 623.236.7518.

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Phoenix, AZ 85086  
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## Actitudes acerca de la Vida Silvestre y Pesca

Esta información nos ayudará a entender sus actitudes hacia la vida silvestre.

¿ Está Usted de acuerdo o desacuerdo con lo siguiente?	Discrepar fuerte	Discrepar Moderado	Discrepar levemente	<u>Ni unos ni otros</u>	Convenir levemente	Convenir moderado	Convenir fuerte
Los seres humanos deben manejar las poblaciones de los peces y de la fauna de modo que los seres humanos se beneficien.	1	2	3	4	5	6	7
Debemos enforzarnos para un mundo donde los seres humanos y los peces y la fauna pueden vivir de lado a lado sin miedo.	1	2	3	4	5	6	7
Debemos esforzarnos para un mundo donde hay una abundancia de peces y fauna para la caza y la pesca.	1	2	3	4	5	6	7
Las necesidades de seres humanos deben tomar prioridad sobre la protección de los peces y la fauna.	1	2	3	4	5	6	7
Veo todas las cosas vivas como parte de una familia grande.	1	2	3	4	5	6	7
Los animals deberían tener derechas simijante a las derechas de seres humanos.	1	2	3	4	5	6	7
La fauna es como mi familia y quiero protegerlos.	1	2	3	4	5	6	7
La gente nunca se debe permitir que otro pescado de carne o de fauna silvestre por cualquier motivo	1	2	3	4	5	6	7
es aceptable para la gente a matar a la fauna silvestre si creen que constituye una amenaza para su vida	1	2	3	4	5	6	7
Es aceptable para la gente a matar a la fauna silvestre si creen que constituye una amenaza para su propiedad	1	2	3	4	5	6	7
Si tuviera que caminar al aire libre, yo estaría preocupado sobre el encuentro con un animal salvaje	1	2	3	4	5	6	7
Es aceptable el uso de peces y vida silvestre en la investigación, aún si no le puede hacer daño o matar a algunos animales	1	2	3	4	5	6	7
Los peces y la fauna están en la tierra primeramente para que la gente utilice.	1	2	3	4	5	6	7
Si yo estuviera acerca la fauna en el aire libre, me sentiría incómoda	1	2	3	4	5	6	7
La caza es cruel e inhumana a los animals.	1	2	3	4	5	6	7

Esta información nos ayudará a entender sus actitudes hacia la vida silvestre.

¿ Está Usted de acuerdo o desacuerdo con lo siguiente?	Discrepar fuerte	Discrepar Moderado	Discrepar levemente	Ni uno ni otro	Convenir levemente	Convenir moderado	Convenir fuerte
me preocupa estar acerca de la fauna, ya que pueden llevar a enfermedades	1	2	3	4	5	6	7
no estoy interesado en saber algo más sobre los peces y la fauna	1	2	3	4	5	6	7
Sería más gratificante para mí ayudar a los animales en lugar de personas	1	2	3	4	5	6	7
Me preocupa estar cerca de la fauna, ya que pueden hacerme daño	1	2	3	4	5	6	7
no estoy interesada en los peces y la fauna	1	2	3	4	5	6	7
Los avances en la tecnología eventualmente dar una solución a nuestros problemas ambientales	1	2	3	4	5	6	7
Cuido sobre animals tanto como hago a la otra gente.	1	2	3	4	5	6	7
La gente que quiere cazar debe ser proporcionada la oportunidad de hacer tanto.	1	2	3	4	5	6	7
Me reconforta en las relaciones que tengo con los animales	1	2	3	4	5	6	7
Valoro el sentido del compañerismo que recibo de animals.	1	2	3	4	5	6	7
La naturaleza debe ser protegido por su propio bien y no simplemente para satisfacer nuestras necesidades	1	2	3	4	5	6	7
La caza no respeta las vidas de animals.	1	2	3	4	5	6	7
Siento un enlace emocional fuerte con los animals.	1	2	3	4	5	6	7
Debemos luchar por una sociedad que enfatiza la protección del medio ambiente sobre el crecimiento económico	1	2	3	4	5	6	7
Ciencia puede dar respuesta a cualquier problema que nos encontramos en la naturaleza	1	2	3	4	5	6	7
La protección de la naturaleza debe ser la máxima prioridad de este país	1	2	3	4	5	6	7
podemos encontrar soluciones a los problemas ambientales a través de la ciencia y la tecnología	1	2	3	4	5	6	7

Por favor escriba cualquier comentario o pregunta que pueda tener para nosotros aquí:

APPENDIX D: Methodologies-Quantitative self-identification materials

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Attitudes about Wildlife & Fish

1.) Please read the description of the person below very carefully.

This person feels that humans and wildlife should co-exist or live in harmony. This person believes that humans and animals depend upon each other and that they benefit one another in their relationship. This person views companionship with animals as very important, and wishes there were never any animal suffering. This person feels that animals have rights similar to humans and are part of an extended family. This person feels that animals are deserving of our care.

Do you agree or disagree with these statements	Strongly Agree	Moderately Agree	Slightly Agree	Neither	Slightly Disagree	Moderately Disagree	Strongly Disagree
I mostly agree with the views of this person	1	2	3	4	5	6	7
I relate to this person	1	2	3	4	5	6	7
I generally tend to think like the person described above	1	2	3	4	5	6	7

2.) The following information will help us understand what prevents you from participating in outdoor recreation

Which of the following is an issue that prevents you from participating in outdoor activities?	Not an issue at all	One of the biggest issues					
Lack of <b>TIME</b>	1	2	3	4	5	6	7
<b>COST</b> of activities	1	2	3	4	5	6	7
I don't know what activities are <b>AVAILABLE</b>	1	2	3	4	5	6	7
<b>LANGUAGE</b> barrier	1	2	3	4	5	6	7
Discrimination	1	2	3	4	5	6	7
I can't <b>ACCESS</b> the places I want to go	1	2	3	4	5	6	7
I have <b>NO ONE TO GO WITH</b>	1	2	3	4	5	6	7
I don't know <b>WHERE TO GO</b>	1	2	3	4	5	6	7

3.) Please read the description of the person below very carefully.

This person feels that humans have dominion over wildlife, and it should be used and managed for human benefit. This person believes that wildlife exists for human use and enjoyment. This person feels there is an abundance of wildlife for hunting and fishing, and would like to manage wildlife so that humans benefit. This person feels that the needs of humans are more important than the needs of wildlife.

Do you agree or disagree with these statements	Strongly Agree	Moderately Agree	Slightly Agree	Neither	Slightly Disagree	Moderately Disagree	Strongly Disagree
I mostly agree with the views of this person	1	2	3	4	5	6	7
I relate to this person	1	2	3	4	5	6	7
I generally tend to think like the person described above	1	2	3	4	5	6	7

**4.) The following demographic information will help us understand you and our customers better. Again, your responses will remain completely confidential and anonymous.**

Are You...?  Male  Female

What is your age? \_\_\_\_\_ years old

What country were you born in?  
\_\_\_\_\_

From what country or countries is your heritage or ancestry? \_\_\_\_\_

About how long have you lived in: Arizona? \_\_\_\_\_ years

The United States \_\_\_\_\_ years

Another country \_\_\_\_\_ years

What is your approximate annual household income before taxes? (Check one.)

<input type="checkbox"/> Less than \$10,000	<input type="checkbox"/> \$35,000 - \$49,999	<input type="checkbox"/> \$100,000 - \$149,999
<input type="checkbox"/> \$10,000 - \$24,999	<input type="checkbox"/> \$50,000 - \$74,999	<input type="checkbox"/> \$150,000 - \$199,999
<input type="checkbox"/> \$25,000 - \$34,999	<input type="checkbox"/> \$75,000 - \$99,999	<input type="checkbox"/> \$200,000 or more

	Only Spanish	More Spanish than English	Both Equally	More English than Spanish	Only English
In general, what language(s) do you read and speak?	1	2	3	4	5
What was the language(s) you used as a child?	1	2	3	4	5
What language(s) do you usually speak at home?	1	2	3	4	5
In which language(s) do you usually think?	1	2	3	4	5
What language(s) do you usually speak with your friends?	1	2	3	4	5
In what language(s) are the T.V. programs you usually watch?	1	2	3	4	5
In what language(s) are the radio programs you usually listen to?	1	2	3	4	5
In general, what language(s) are the movies, T.V. and radio programs you prefer to watch and listen to?	1	2	3	4	5
	All Latinos	More Latino than White	About half and half	More White than Latino	All white
Your close friends are	1	2	3	4	5
You prefer going to social gatherings/parties at which people are	1	2	3	4	5
The persons you visit or who visit you are	1	2	3	4	5
If you could choose your children's friends you would want them to be	1	2	3	4	5

**APPENDIX E: Methodologies-Qualitative experiences materials**

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## Attitudes about Wildlife & Fish

At this station, you will be asked about experiences or stories that you have had regarding wildlife. Please begin thinking about those experiences now. You may use the space below to write down words or phrases to stimulate your memory. If you don't have any experiences with wildlife, don't worry, begin thinking about experiences that you would like to have or stories you have heard.

**APPENDIX F: Methodologies-Qualitative pictures materials**

**#**

**Attitudes about Wildlife & Fish**



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		<b>Strongly Disagree</b>	<b>Neutral</b>				<b>Strongly Agree</b>	
<b>Photo #1</b>	I like this photo	1	2	3	4	5	6	7
	I can relate to this photo	1	2	3	4	5	6	7
<b>Photo #2</b>	I like this photo	1	2	3	4	5	6	7
	I can relate to this photo	1	2	3	4	5	6	7
<b>Photo #3</b>	I like this photo	1	2	3	4	5	6	7
	I can relate to this photo	1	2	3	4	5	6	7
<b>Photo #4</b>	I like this photo	1	2	3	4	5	6	7
	I can relate to this photo	1	2	3	4	5	6	7
<b>Photo #5</b>	I like this photo	1	2	3	4	5	6	7
	I can relate to this photo	1	2	3	4	5	6	7
<b>Photo #6</b>	I like this photo	1	2	3	4	5	6	7
	I can relate to this photo	1	2	3	4	5	6	7
<b>Photo #7</b>	I like this photo	1	2	3	4	5	6	7
	I can relate to this photo	1	2	3	4	5	6	7
<b>Photo #8</b>	I like this photo	1	2	3	4	5	6	7
	I can relate to this photo	1	2	3	4	5	6	7
<b>Photo #9</b>	I like this photo	1	2	3	4	5	6	7
	I can relate to this photo	1	2	3	4	5	6	7






## APPENDIX G: Methodologies- photos interview protocol







Room	Station
102	Experiences
104	Pictures
106	Survey

Group	6-6:40	6:40-7:20	7:20-8
A	Experiences	Survey	Pictures
B	Pictures	Experiences	Survey
C	Survey	Pictures	Experiences

### Interview Guide for Pictures

- **Introduction**
- **Define Wildlife** When we talk about wildlife, we mean wild animals that are not domesticated, trained to be of use to humans, or pets. Wildlife could include reptiles, amphibians, fish, birds, mammals.
- **Prime the participant** In the next few minutes, I would like to listen to your comments and thoughts regarding wildlife. I will show you a scene and ask you to rate it, and to indicate if you relate to the photo. Then we will talk about your answers with some follow-up questions. Remember there are no wrong answers here. Please take your time, I will tell you if we're running out of time.
- **Confidentiality** Keep in mind that all of your responses from tonight will remain confidential. I will take notes to capture your opinions, but we will also electronically record your stories, so we can write them down later.
- **Identify** Just so everybody is on the same page, what is your survey number?  
[Repeat number back into the recorder]

	<p>Please look at this photo and rate it on your sheet [Photo #1].</p> <ul style="list-style-type: none"> <li>○ Do you like this photo? Why?</li> <li>○ Do you relate to this photo? Why?</li> <li>○ How does this photo make you feel? Why? <ul style="list-style-type: none"> <li>▪ [Is this something you might like to do?]</li> <li>▪ [Do you feel this is cruel to the birds?]</li> </ul> </li> </ul>
	<p>Please look at this photo and rate it on your sheet [Photo #2].</p> <ul style="list-style-type: none"> <li>○ Do you like this photo? Why?</li> <li>○ Do you relate to this photo? Why?</li> <li>○ How does this photo make you feel? <ul style="list-style-type: none"> <li>▪ [If you were in this situation, would you feel a need to protect this animal?]</li> <li>▪ [If this animal were hurt, what would you do?]</li> <li>▪ [If he were keeping it as a pet, what is your reaction?]</li> </ul> </li> </ul>
	<p>Please look at this photo and rate it on your sheet [Photo #3].</p> <ul style="list-style-type: none"> <li>○ Do you like this photo? Why?</li> <li>○ Do you relate to this photo? Why?</li> <li>○ How does this photo make you feel? <ul style="list-style-type: none"> <li>▪ [Do you agree with the sign this woman is holding?]</li> <li>▪ [Do you feel that animals and humans have similar rights?]</li> </ul> </li> </ul>

	<p>Please look at this photo and rate it on your sheet [Photo #4].</p> <ul style="list-style-type: none"> <li>○ Do you like this photo? Why?</li> <li>○ Do you relate to this photo? Why?</li> <li>○ How does this photo make you feel? <ul style="list-style-type: none"> <li>▪ [Is this park safe?]</li> <li>▪ [Should we relocate this animal or should humans leave the area?]</li> <li>▪ [Do you feel the animal is scared?]</li> </ul> </li> </ul>
	<p>Please look at this photo and rate it on your sheet [Photo #5].</p> <ul style="list-style-type: none"> <li>○ Do you like this photo? Why?</li> <li>○ Do you relate to this photo? Why?</li> <li>○ How does this photo make you feel? <ul style="list-style-type: none"> <li>▪ [Is this girl safe?]</li> <li>▪ [Do you feel you might like to feed these deer?]</li> <li>▪ [What are the deer thinking in this photo?]</li> </ul> </li> </ul>
	<p>Please look at this photo and rate it on your sheet [Photo #6].</p> <ul style="list-style-type: none"> <li>○ Do you like this photo? Why?</li> <li>○ Do you relate to this photo? Why?</li> <li>○ How does this photo make you feel? <ul style="list-style-type: none"> <li>▪ [Do you feel this is good for the children?]</li> <li>▪ [Is it cruel to put animals in zoos?]</li> </ul> </li> </ul>
	<p>Please look at this photo and rate it on your sheet [Photo #7].</p> <ul style="list-style-type: none"> <li>○ Do you like this photo? Why?</li> <li>○ Do you relate to this photo? Why?</li> <li>○ How does this photo make you feel? <ul style="list-style-type: none"> <li>▪ [Should we manage these deer so that humans benefit?]</li> </ul> </li> </ul>
	<p>Please look at this photo and rate it on your sheet [Photo #8].</p> <ul style="list-style-type: none"> <li>○ Do you like this photo? Why?</li> <li>○ Do you relate to this photo? Why?</li> <li>○ How does this photo make you feel? <ul style="list-style-type: none"> <li>▪ [Is it okay for this animal to suffer so that humans can use it?]</li> <li>▪ [If you felt the need to help this animal, what would you do to help it?]</li> </ul> </li> </ul>
	<p>Please look at this photo and rate it on your sheet [Photo #9].</p> <ul style="list-style-type: none"> <li>○ Do you like this photo? Why?</li> <li>○ Do you relate to this photo? Why?</li> <li>○ How does this photo make you feel? <ul style="list-style-type: none"> <li>▪ [Do you feel there are enough fish for this kind of activity?]</li> <li>▪ [Is this something you might like to do?]</li> <li>▪ [Do feel this is fair to the fish?]</li> </ul> </li> </ul>

\*\*\*\*\*  
That's all I have for the interview unless there is anything else you would like to add.

\*Photos taken from McCoy, 2010.

## APPENDIX H: Methodologies- Stories interview protocol

Room	Station
102	Experiences
104	Pictures
106	Survey

Group	6-6:40	6:40-7:20	7:20-8
A	Experiences	Survey	Pictures
B	Pictures	Experiences	Survey
C	Survey	Pictures	Experiences

### Interview Guide for Experiences

- **Introduction**
- **Define Wildlife** When we talk about wildlife, we mean wild animals that are not domesticated, trained to be of use to humans, or pets. Wildlife could include reptiles, amphibians, fish, birds, mammals.
- **Prime the participant** I will be asking five primary questions and follow-up questions. Please take the time that you need to answer my questions. I will tell you if we're running out of time.
- **Confidentiality** Keep in mind that all of your responses from tonight will remain confidential. I will take notes to capture your opinions, but we will also electronically record your stories, so we can write them down later.
- **Identify** Just so everybody is on the same page, what is your survey number?  
[Repeat number back into the recorder]
- You can tell me about as many experiences as you like that have occurred during any time in your life. Begin wherever you like and take the time that you need. I'll listen first. I won't interrupt.

\*\*\*\*\*  
Please share with me experiences with wildlife that make you **[HAPPY]**?

[If needed:]

Can you give a more detailed description of what happened?  
Do you have another example of this?

[If person has no experiences:]

(1<sup>st</sup> attempt) That's fine. Can you imagine an experience with wildlife that might make you **[HAPPY]**?

(2nd attempt) Or can you think of a story or experience that you've heard of happening to someone else that would make you **[HAPPY]**?

(3rd attempt) What about something you have read or watched on TV that made you **[HAPPY]**?

Why do these experiences make you **[HAPPY]**?

\*\*\*\*\*

**Repeat above Section with SAD, ANGRY, and AFRAID**

Now for the final question: In general, could you describe how you feel about and relate to wildlife?  
That's all I have for the interview unless there is anything else you would like to add

## APPENDIX I: Methodologies- Participant debrief



Arizona  
Game & Fish  
Department

### Attitudes about Wildlife & Fish

Thank you!

Thank you for agreeing to participate in this study. Your identity and all information will be confidential and not shared with any other governmental agency or business. Now that we are finished with the study, we will write down your opinions, remove all personal information, and destroy the recording. We recorded the stories because it is too difficult to capture the richness of the experience by only taking notes.

We have asked you to share your thoughts and opinions about wildlife. We thank you for sharing with us as they will be valuable as we try to manage wildlife for the people of Arizona.

We are grateful for your participation tonight. As a demonstration of our gratitude, we would like to compensate you for your time. Please accept this as a gift, from our partner, Behavioral Research Center. They are an established research firm in Phoenix and a great friend to Arizona Game and Fish Department and the Latino community.

The information you provide will help our department perform better, and provide improved services to you. Additionally, we were testing some of our methodologies for other wildlife agencies. Although we will never share your data with them, we will share our results in aggregate so that they can benefit from our findings. If you have any questions or concerns please feel free to contact the Primary Investigator, Loren Chase at [lchase@azgfd.gov](mailto:lchase@azgfd.gov) or at 623.236.7518.

5000 W Carefree Highway  
Phoenix, AZ 85086  
602.942.3000  
[www.azgfd.gov](http://www.azgfd.gov)

## APPENDIX J: 2012 Trend Survey Instrument

4. Hello, my name is \_\_\_\_\_, and I'm calling on behalf of the state of Arizona to do an evaluation of wildlife and outdoor-related programs in Arizona. We are not selling anything or asking for donations, but we'd like to ask you a few questions. Your feedback is needed to evaluate several programs and help make improvements for the people of Arizona.  
CONPER1 1:7-8

9. First, I'm going to ask about your participation in and opinions on various activities. Please tell me if you, personally, participated in each one in the last 12 months in Arizona.  
INTRO1

12. Did you, personally, go fishing in Arizona in the past 12 months?  
FISHED 1:21  
(CHECK ONLY ONE ANSWER)

- 1. Invalid answer. Select another. (GO TO QUESTION 12)
- 2. Yes (GO TO QUESTION 13)
- 3. No
- 4. Don't know

SKIP TO QUESTION 16

13. Overall how satisfied or dissatisfied are you with your fishing experiences in Arizona in the past 12 months?  
FISHSAT 1:22

- 1. Invalid answer. Select another. (GO TO QUESTION 13)
- 2. Very satisfied
- 3. Somewhat satisfied
- 4. Neither satisfied nor dissatisfied
- 5. Somewhat dissatisfied
- 6. Very dissatisfied
- 7. Don't know

14. How many days did you go fishing in Arizona in the past 12 months?  
(PORTIONS OF A DAY COUNT AS A WHOLE DAY)  
(MULTIPLE OUTINGS WITHIN ONE DAY COUNT AS A SINGLE DAY)  
(ENTER ? FOR DON'T KNOW / REFUSED)  
|\_|\_|\_| day(s)

15. How many days did you go fishing in Arizona in the past 12 months?  
(Computation for Don't know variable)  
FISHDAYX 1:26-28

16. How many years has it been since you went fishing in Arizona?  
(ENTER NUMBER OF YEARS; ROUND PARTIAL YEARS TO THE NEXT YEAR)  
(ENTER 888 FOR NEVER; ENTER ? FOR DON'T KNOW)  
(ENTER ? FOR DON'T KNOW)  
LASTFISH 1:29-31

|\_|\_|\_| year(s)

17. How many years has it been since you went fishing in Arizona?  
(Computation for Don't know variable)

LASTFISX 1:32-34

\_\_\_\_ year(s)

26. Did you, personally, participate in boating  
activities in Arizona in the past 12 months?

BOATED 4:241

(CHECK ONLY ONE ANSWER)

27. Overall how satisfied or dissatisfied are you with  
your boating experiences in Arizona in the past 12 months?

BOATSAT 4:242

(CHECK ONLY ONE ANSWER)

1. Invalid answer. Select another. (GO TO QUESTION 27)

2. Very satisfied

3. Somewhat satisfied

4. Neither satisfied nor dissatisfied

5. Somewhat dissatisfied

6. Very dissatisfied

7. Don't know

29. Overall how satisfied or dissatisfied are you with your  
off-highway vehicle driving in Arizona in the past 12 months?

OHVSAT 4:244

1. Invalid answer. Select another. (GO TO QUESTION 29)

2. Very satisfied

3. Somewhat satisfied

4. Neither satisfied nor dissatisfied

5. Somewhat dissatisfied

6. Very dissatisfied

7. Don't know

30. How many days did you participate in off-highway  
vehicle driving in Arizona in the past 12 months?  
(PORTIONS OF A DAY COUNT AS A WHOLE DAY)  
(MULTIPLE OUTINGS WITHIN ONE DAY COUNT AS A SINGLE DAY)  
(ENTER ? FOR DON'T KNOW / REFUSED)

\_\_\_\_ day(s)

31. How many days did you participate in off-highway  
vehicle driving in Arizona in the past 12 months?  
(Computation for Don't know variable)

OHVDAYX 4:248-250

\_\_\_\_ day(s)

32. Did you, personally, go target or recreational shooting,  
including archery, in Arizona in the past 12 months?

- 1. Invalid answer. Select another. (GO TO QUESTION 32)
- 2. Yes (GO TO QUESTION 33)
- 3. No
- 4. Don't know

33. Overall how satisfied or dissatisfied are you with your target or recreational shooting in Arizona in the past 12 months?  
SHOTSAT 5:2  
(CHECK ONLY ONE ANSWER)

- 1. Invalid answer. Select another. (GO TO QUESTION 33)
- 2. Very satisfied
- 3. Somewhat satisfied
- 4. Neither satisfied nor dissatisfied
- 5. Somewhat dissatisfied
- 6. Very dissatisfied
- 7. Don't know

34. How many days did you participate in target or recreational shooting in Arizona in the past 12 months?  
(IF ASKED: Includes archery.)  
(PORTIONS OF A DAY COUNT AS A WHOLE DAY)  
(MULTIPLE OUTINGS WITHIN ONE DAY COUNT AS A SINGLE DAY)  
(ENTER ? FOR DON'T KNOW / REFUSED)  
SHOTDAYS 5:3-5

\_\_\_\_ day(s)

35. How many days did you participate in target or recreational shooting in Arizona in the past 12 months?  
(Computation for Don't know variable)  
SHOTDAYX 5:6-8

\_\_\_\_ day(s)

36. What percentage of your target or recreational shooting in the past 12 months was done at a public shooting range?  
(ENTER ? FOR DON'T KNOW)  
SHOTPER 5:9-11

\_\_\_\_%

37. What percentage of your target or recreational shooting in the past 12 months was done at a public shooting range?  
(Computation for Don't know variable)  
SHOTPERX 5:12-14

\_\_\_\_%

38. How many years has it been since you went target or recreational shooting in Arizona?  
(ENTER NUMBER OF YEARS; ROUND PARTIAL YEARS TO THE NEXT YEAR)  
(ENTER 888 FOR NEVER; ENTER ? FOR DON'T KNOW)  
(ENTER ? FOR DON'T KNOW)  
LASTSHOT 5:15-17

\_\_\_\_ year(s)

39. How many years has it been since you went target or recreational shooting in Arizona?

(Computation for Don't know variable)

LASTSHOX 5:18-20

\_\_\_\_ year(s)

40. Did you, personally, go hunting in Arizona in the past 12 months?

HUNT 5:21

(CHECK ONLY ONE ANSWER)

1. Invalid answer. Select another. (GO TO QUESTION 40)

2. Yes (GO TO QUESTION 41)

3. No

4. Don't know

41. Overall how satisfied or dissatisfied are you with your hunting experiences in Arizona in the past 12 months?

HUNTSAT 5:22

(CHECK ONLY ONE ANSWER)

1. Invalid answer. Select another. (GO TO QUESTION 41)

2. Very satisfied

3. Somewhat satisfied

4. Neither satisfied nor dissatisfied

5. Somewhat dissatisfied

6. Very dissatisfied

7. Don't know

42. How many days did you participate in hunting in Arizona in the past 12 months?

(PORTIONS OF A DAY COUNT AS A WHOLE DAY)

(MULTIPLE OUTINGS WITHIN ONE DAY COUNT AS A SINGLE DAY)

\_\_\_\_ day(s)

43. How many days did you participate in hunting in Arizona in the past 12 months?

(Computation for Don't know variable)

HUNTDAYX 5:26-28

\_\_\_\_ day(s)

44. How many years has it been since you went hunting in Arizona?

(ENTER NUMBER OF YEARS; ROUND PARTIAL YEARS TO THE NEXT YEAR)

(ENTER 888 FOR NEVER; ENTER ? FOR DON'T KNOW)

LASTHUNT 5:29-31

\_\_\_\_ year(s)

45. How many years has it been since you went hunting in Arizona?

(Computation for Don't know variable)

LASTHNTX 5:32-34

\_\_\_\_ year(s)



46. In general, do you support or oppose legal, regulated hunting?

LEGHUNT 5:35

(CHECK ONLY ONE ANSWER)

- 1. Invalid answer. Select another. (GO TO QUESTION 46)
- 2. Strongly support
- 3. Moderately support
- 4. Neither support nor oppose
- 5. Moderately oppose
- 6. Strongly oppose
- 7. Don't know

47. Did you, personally, take a special interest in wildlife at your home in Arizona by closely observing or trying to identify types of wildlife in the past 12 months?

INTWILD 5:36

(CHECK ONLY ONE ANSWER)

- 1. Invalid answer. Select another. (GO TO QUESTION 47)
- 2. Yes
- 3. No
- 4. Don't know

48. Did you, personally, spend time away from home watching or photographing wild animals or fish in Arizona in the past 12 months? This does NOT include watching or photographing wild animals or fish at home, during trips to zoos, circuses, aquariums, museums, or hunting or fishing trips.

WACHWILD 5:37

(CHECK ONLY ONE ANSWER)

- 1. Invalid answer. Select another. (GO TO QUESTION 48)
- 2. Yes (GO TO QUESTION 49)
- 3. No
- 4. Don't know

49. Overall how satisfied or dissatisfied are you with your experiences away from home watching or photographing wild animals or fish in Arizona in the past 12 months?

WILDSAT 5:38

(CHECK ONLY ONE ANSWER)

- 1. Invalid answer. Select another. (GO TO QUESTION 49)
- 2. Very satisfied
- 3. Somewhat satisfied
- 4. Neither satisfied nor dissatisfied
- 5. Somewhat dissatisfied
- 6. Very dissatisfied
- 7. Don't know

50. How many days did you spend away from home watching or photographing wild animals or fish in Arizona in the past 12 months?

(PORTIONS OF A DAY COUNT AS A WHOLE DAY)

(MULTIPLE OUTINGS WITHIN ONE DAY COUNT AS A SINGLE DAY)

(ENTER ? FOR DON'T KNOW / REFUSED)

WILDDAYS 5:39-41

\_\_\_\_ day(s)

51. How many days did you spend away from home watching or photographing wild animals or fish in Arizona in the past 12 months?  
(Computation for Don't know variable)

WILDDAYX 5:42-44

\_\_\_\_ day(s)

52. How many years has it been since you spent time away from home watching or photographing wild animals or fish in Arizona?  
(ENTER NUMBER OF YEARS; ROUND PARTIAL YEARS TO THE NEXT YEAR)  
(ENTER 888 FOR NEVER; ENTER ? FOR DON'T KNOW)

LASTWACH 5:45-47

\_\_\_\_ year(s)

LOWEST VALUE = 1

53. How many years has it been since you spent time away from home watching or photographing wild animals or fish in Arizona?  
(Computation for Don't know variable)

LASTWACX 5:48-50

\_\_\_\_ year(s)

83. Humans should manage fish and wildlife populations so that humans benefit.  
(READ SCALE AS NECESSARY; PROMPT FOR DEGREE)

WLDVAL1 11:9

(CHECK ONLY ONE ANSWER)

- 1. Invalid answer. Select another. (GO TO QUESTION 83)
- 2. Strongly agree
- 3. Moderately agree
- 4. Slightly agree
- 5. Neither agree nor disagree
- 6. Slightly disagree
- 7. Moderately disagree
- 8. Strongly disagree
- 9. (DNR) Don't know

84. We should strive for a world where humans, wildlife, and fish can live side by side without fear.  
(READ SCALE AS NECESSARY; PROMPT FOR DEGREE)

WLDVAL2 11:10

(CHECK ONLY ONE ANSWER)

- 1. Invalid answer. Select another. (GO TO QUESTION 84)
- 2. Strongly agree
- 3. Moderately agree
- 4. Slightly agree
- 5. Neither agree nor disagree
- 6. Slightly disagree
- 7. Moderately disagree
- 8. Strongly disagree
- 9. (DNR) Don't know

85. We should strive for a world where there's an abundance of fish and wildlife for hunting and fishing.  
(READ SCALE AS NECESSARY; PROMPT FOR DEGREE)  
WLDVAL3 11:11  
(CHECK ONLY ONE ANSWER)

- 1. Invalid answer. Select another. (GO TO QUESTION 85)
- 2. Strongly agree
- 3. Moderately agree
- 4. Slightly agree
- 5. Neither agree nor disagree
- 6. Slightly disagree
- 7. Moderately disagree
- 8. Strongly disagree
- 9. (DNR) Don't know

86. The needs of humans should take priority over fish and wildlife protection.  
(READ SCALE AS NECESSARY; PROMPT FOR DEGREE)  
WLDVAL4 11:12  
(CHECK ONLY ONE ANSWER)

- 1. Invalid answer. Select another. (GO TO QUESTION 86)
- 2. Strongly agree
- 3. Moderately agree
- 4. Slightly agree
- 5. Neither agree nor disagree
- 6. Slightly disagree
- 7. Moderately disagree
- 8. Strongly disagree
- 9. (DNR) Don't know

87. I view all living things as part of one big family.  
(READ SCALE AS NECESSARY; PROMPT FOR DEGREE)  
WLDVAL5 11:13  
(CHECK ONLY ONE ANSWER)

- 1. Invalid answer. Select another. (GO TO QUESTION 87)
- 2. Strongly agree
- 3. Moderately agree
- 4. Slightly agree
- 5. Neither agree nor disagree
- 6. Slightly disagree
- 7. Moderately disagree
- 8. Strongly disagree
- 9. (DNR) Don't know

88. Animals should have rights similar to the rights of humans.  
(READ SCALE AS NECESSARY; PROMPT FOR DEGREE)  
WLDVAL6 11:14

- 1. Invalid answer. Select another. (GO TO QUESTION 88)
- 2. Strongly agree
- 3. Moderately agree
- 4. Slightly agree

- 5. Neither agree nor disagree
- 6. Slightly disagree
- 7. Moderately disagree
- 8. Strongly disagree
- 9. (DNR) Don't know

89. Wildlife are like my family and I want to protect them.  
(READ SCALE AS NECESSARY; PROMPT FOR DEGREE)  
WLDVAL7 11:15  
(CHECK ONLY ONE ANSWER)

- 1. Invalid answer. Select another. (GO TO QUESTION 89)
- 2. Strongly agree
- 3. Moderately agree
- 4. Slightly agree
- 5. Neither agree nor disagree
- 6. Slightly disagree
- 7. Moderately disagree
- 8. Strongly disagree
- 9. (DNR) Don't know

90. Fish and Wildlife are on earth primarily for people to use.  
(READ SCALE AS NECESSARY; PROMPT FOR DEGREE)  
WLDVAL8 11:16

- 1. Invalid answer. Select another. (GO TO QUESTION 90)
- 2. Strongly agree
- 3. Moderately agree
- 4. Slightly agree
- 5. Neither agree nor disagree
- 6. Slightly disagree
- 7. Moderately disagree
- 8. Strongly disagree
- 9. (DNR) Don't know

91. Hunting is cruel and inhumane to animals.  
(READ SCALE AS NECESSARY; PROMPT FOR DEGREE)  
WLDVAL9 11:17  
(CHECK ONLY ONE ANSWER)

- 1. Invalid answer. Select another. (GO TO QUESTION 91)
- 2. Strongly agree
- 3. Moderately agree
- 4. Slightly agree
- 5. Neither agree nor disagree
- 6. Slightly disagree
- 7. Moderately disagree
- 8. Strongly disagree
- 9. (DNR) Don't know

92. I care about animals as much as I do other people.  
(READ SCALE AS NECESSARY; PROMPT FOR DEGREE)

WLDVAL10 11:18

(CHECK ONLY ONE ANSWER)

- 1. Invalid answer. Select another. (GO TO QUESTION 92)
- 2. Strongly agree
- 3. Moderately agree
- 4. Slightly agree
- 5. Neither agree nor disagree
- 6. Slightly disagree
- 7. Moderately disagree
- 8. Strongly disagree
- 9. (DNR) Don't know

93. People who want to hunt should be provided the opportunity to do so.  
(READ SCALE AS NECESSARY; PROMPT FOR DEGREE)

WLDVAL11 11:19

(CHECK ONLY ONE ANSWER)

- 1. Invalid answer. Select another. (GO TO QUESTION 93)
- 2. Strongly agree
- 3. Moderately agree
- 4. Slightly agree
- 5. Neither agree nor disagree
- 6. Slightly disagree
- 7. Moderately disagree
- 8. Strongly disagree
- 9. (DNR) Don't know

94. I value the sense of companionship I receive from animals.  
(READ SCALE AS NECESSARY; PROMPT FOR DEGREE)

WLDVAL12 11:20

(CHECK ONLY ONE ANSWER)

- 1. Invalid answer. Select another. (GO TO QUESTION 94)
- 2. Strongly agree
- 3. Moderately agree
- 4. Slightly agree
- 5. Neither agree nor disagree
- 6. Slightly disagree
- 7. Moderately disagree
- 8. Strongly disagree
- 9. (DNR) Don't know

95. Hunting does not respect the lives of animals.  
(READ SCALE AS NECESSARY; PROMPT FOR DEGREE)

WLDVAL13 11:21

(CHECK ONLY ONE ANSWER)

- 1. Invalid answer. Select another. (GO TO QUESTION 95)
- 2. Strongly agree
- 3. Moderately agree
- 4. Slightly agree
- 5. Neither agree nor disagree

- 6. Slightly disagree
- 7. Moderately disagree
- 8. Strongly disagree
- 9. (DNR) Don't know

96. I feel a strong emotional bond with animals.  
 (READ SCALE AS NECESSARY; PROMPT FOR DEGREE)  
 WLDVAL14 11:22  
 (CHECK ONLY ONE ANSWER)

- 1. Invalid answer. Select another. (GO TO QUESTION 96)
- 2. Strongly agree
- 3. Moderately agree
- 4. Slightly agree
- 5. Neither agree nor disagree
- 6. Slightly disagree
- 7. Moderately disagree
- 8. Strongly disagree
- 9. (DNR) Don't know

IF (#82 = 15) GO TO #98

97. Wildlife contributes to my quality of life.  
 (READ SCALE AS NECESSARY; PROMPT FOR DEGREE)  
 IMPST4 11:23  
 (CHECK ONLY ONE ANSWER)

- 1. Invalid answer. Select another. (GO TO QUESTION 97)
- 2. Strongly agree
- 3. Moderately agree
- 4. Slightly agree
- 5. Neither agree nor disagree
- 6. Slightly disagree
- 7. Moderately disagree
- 8. Strongly disagree
- 9. (DNR) Don't know

105. Great! We're almost finished. The final questions are for  
 background information and help us analyze the results.  
 DEMO  
 PRESS ENTER TO CONTINUE

106. How many years have you lived in Arizona?  
 (ROUND TO THE NEAREST YEAR)  
 (ANYTHING < 6 MONTHS ROUNDS TO ZERO)  
 (ENTER 888 FOR REFUSED; ? FOR DON'T KNOW)  
 LIVEYRS 11:30-32

\_\_\_\_ year(s)

107. In what county do you live?

- 1. Invalid answer. Select another. (GO TO QUESTION 107)

- 2. Apache
- 3. Cochise
- 4. Coconino
- 5. Gila
- 6. Graham
- 7. Greenlee
- 8. La Paz
- 9. Maricopa
- 10. Mohave
- 11. Navajo
- 12. Pima
- 13. Pinal
- 14. Santa Cruz
- 15. Yavapai
- 16. Yuma
- 17. Don't know
- 18. Refused

108. Do you consider your place of residence to be a large city or urban area, a suburban area, a small city or town, a rural area on a farm or ranch, or a rural area NOT on a farm or ranch?

RESIDE 11:35

(CHECK ONLY ONE ANSWER)

- 1. Invalid answer. Select another. (GO TO QUESTION 108)
- 2. Large city or urban area
- 3. Suburban area
- 4. Small city or town
- 5. Rural area on a farm or ranch
- 6. Rural area NOT on a farm or ranch
- 7. Don't know
- 8. Refused

109. What is the highest level of education you have completed?

EDUCATE 11:36-37

(CHECK ONLY ONE ANSWER)

- 1. Invalid answer. Select another. (GO TO QUESTION 109)
- 2. Not a high school graduate
- 3. High school graduate or equivalent
- 4. Some college or trade school, no degree
- 5. Associate's degree or trade school degree
- 6. Bachelor's degree
- 7. Master's degree
- 8. Professional or doctorate degree (e.g., M.D. or Ph.D.)
- 9. Don't know
- 10. Refused

112. What races or ethnic backgrounds do you consider yourself?

Please mention all that apply.

(DO NOT READ LIST)

RACE 11:38-49

(CHECK ALL THAT APPLY)

- 1. White or Caucasian
- 2. Black or African-American
- 3. Hispanic or Latino (includes Mexican, Central American, etc.)
- 4. Native American or Alaskan native or Aleutian
- 5. Native Hawaiian
- 6. Middle Eastern
- 7. East Asian (from Japan, China, Korea, Philippines, etc.)
- 8. South Asian (from India, Pakistan, Bangladesh, etc.)
- 9. African (NOT African-American)
- 10. Other
- 11. Don't know
- 12. Refused

114. Which of these categories best describes your total household income before taxes last year?

INCOME 12:241-242

(CHECK ONLY ONE ANSWER)

- 1. Invalid answer. Select another. (GO TO QUESTION 114)
- 2. Under \$20,000
- 3. \$20,000-\$39,999
- 4. \$40,000-\$59,999
- 5. \$60,000-\$79,999
- 6. \$80,000-\$99,999
- 7. \$100,000-\$119,999
- 8. \$120,000 or more
- 9. Don't know
- 10. Refused

115. May I ask your age?

(ENTER 888 FOR REFUSED; ? FOR DON'T KNOW)

AGE 12:243-245

\_\_\_\_ years old

LOWEST VALUE = 18

IF (#115 = 888) GO TO #118

IF (#115 > 105) GO TO #115

IF (#115 = 88) GO TO #116

IF (#115 > 79) GO TO #117

119. That's the end of the survey. Thanks for your time and cooperation. If you have any additional comments, I can record them here.

END 13:6-245

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121. OBSERVE AND RECORD RESPONDENT'S GENDER.

GENDER 14:241



(CHECK ONLY ONE ANSWER)

- 1. Invalid answer. Select another. (GO TO QUESTION 121)
- 2. Male
- 3. Female
- 4. Don't know

## APPENDIX K: Watchable Wildlife Team Survey Instrument

### Introduction

Hello, my name is \_\_\_\_\_, and I am calling on behalf of the state of Arizona. We are calling to ask some questions about wildlife in Arizona. We are not selling anything or asking for donations. Do you have a few minutes to answer some questions for me?

### SECTION I.

First, I would like to know how often you have personally participated in each of the following activities in the past 2 years in Arizona. Have you participated in [ACTIVITY] frequently, sometimes, rarely, or never?

(Activities administered in random order)	Frequently	Sometimes	Rarely	Never	Don't know
...hunting					
...fishing					
...taking a trip at least 1 mile from your home for the primary purpose of viewing wildlife or bird watching					
...wildlife photography					
...hiking					
...camping					
...motorsports, such as ATVs, motorcycles, etc.					
...boating					
...target shooting					

Next, please tell me how interested you are in participating in each of those same activities in the next 2 years in Arizona. How about [ACTIVITY]? (Are you very interested, somewhat interested, or not at all interested?)

(Activities administered in same order as previous series measuring participation)	Very interested	Somewhat interested	Not at all interested	Don't know
...hunting				

**...fishing**

**...taking a trip at least 1 mile from your home for the primary purpose of viewing wildlife or bird watching**

**...wildlife photography**

**...hiking**

**...camping**

**...motorsports, such as ATVs, motorcycles, etc.**

**...boating**

**...target shooting**

**SECTION VIII. –Wildlife Values Orientation**

*Please tell me if you agree or disagree with each of the following statements.*

	Strongly Agree	Moderately Agree	Slightly Agree	Neither	Slightly Disagree	Moderately Disagree	Strongly Disagree
Humans should manage fish and wildlife population so that humans benefit							
We should strive for a world where humans and wildlife and fish can live side by side without fear							
We should strive for a world where there's an abundance of fish and wildlife for hunting and fishing							
The needs of humans should take priority over fish and wildlife protection							
I view all living things as part of one big family							
Animals should have rights similar to the rights of humans							
Wildlife are like my family and I want to protect them							
Fish and wildlife are on earth primarily for people to use							
Hunting is cruel and inhumane to animals							
I care about animals as much as I do other people							
People who want to hunt should be provided the opportunity to do so							
I value the sense of companionship I receive from animals							
Hunting does not respect the lives of animals							
I feel a strong emotional bond with animals							

**SECTION IX. -Demographic**

The following **demographic information** will be used to help us analyze the data.

**(IF ASKED: Your responses will remain completely confidential, nor will the information be sold or be made available publicly.)**

How many children, age 17 or YOUNGER, do you currently have living in your household?

About how long have you lived in Arizona? \_\_\_\_\_ Years \_\_\_\_\_ Months

What is the highest level of education that you have completed? (*Check one.*)

- Not a high school diploma       4-year college degree  
 High school diploma or GED       Advanced degree  
 2-year degree or trade school

What is your approximate annual household income before taxes? (*Check one.*)

- Less than \$10,000       \$35,000 - \$49,999       \$100,000 - \$149,999  
 \$10,000 - \$24,999       \$50,000 - \$74,999       \$150,000 - \$199,999  
 \$25,000 - \$34,999       \$75,000 - \$99,999       \$200,000 or more

Are you...? (*Check one or more categories.*)

- White       Asian  
 Hispanic or Latino       Native Hawaiian or Other Pacific Islander  
 Black or African American       Other (*Please print on line below.*)  
 American Indian or Alaska Native
- 

May I ask your age?  
(ENTER AGE)

That's the end of the survey. Thanks for your time and cooperation.

Gender (OBSERVED, NOT ASKED)

## APPENDIX L: Public Passion Survey Instrument

\*Selected survey items from the interview transcript\*

### **Introduction**

Hello, my name is \_\_\_\_\_, and I am calling on behalf of the state of Arizona. We are calling to ask some questions about wildlife in Arizona. We are not selling anything or asking for donations. Do you have a few minutes to answer some questions for me?

Are you at least 18 years old?

(CHECK ONLY ONE ANSWER)

Yes (CONTINUE SURVEY)

No (END SURVEY)

DNR: Don't know (END SURVEY)

**Stated Importance** –An overt measure of the importance of various aspects of nature and management of wildlife and habitat (randomize)

((CHECK ONLY ONE ANSWER))	<u>Strongly Agree</u>	<u>Moderately Agree</u>	<u>Slightly Agree</u>	<u>Neither agree nor disagree</u>	<u>Slightly disagree</u>	<u>Moderately Disagree</u>	<u>Strongly Disagree</u>
Wildlife is important to me							
Seeing wildlife in nature is important to me							
Knowing that wildlife is there is important to me							
Wildlife contributes to my quality of life							
Having plenty of different species of wildlife around is important to me							
Arizona should buy and protect wildlife habitat							
Arizona should work with local governments to set aside wildlife habitat							
Arizona should work with private landowners to protect wildlife habitat							
Arizona should use lottery dollars to protect wildlife habitat							
Arizona should use sales tax revenues to protect wildlife habitat	1	2	3	4	5	6	7

### **Importance of Environment**

Please take a moment to think of all the reasons that you live in Arizona and tell me how important or unimportant each of the following are.

(COMPUTER WILL ADMINISTER THE FIRST THREE IMPORTANT QUESTION IN RANDOM ORDER, FOLLOWED BY ADMINISTERING THE LAST TWO IMPORTANCE QUESTIONS IN RANDOM	Very Important	Somewhat Important	Neither important nor unimportant	Somewhat Unimportant	Very Unimportant
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ORDER)  
(INTERVIEWER: READ SCALE AS  
NECESSARY; PROMPT FOR DEGREE)  
(CHECK ONLY ONE ANSWER)

How important is **The Natural  
Beauty of Arizona** in your decision to  
live in Arizona

How important are **Natural  
Resources** in your decision to live in  
Arizona

How important is Arizona's diverse  
**Wildlife** in your decision to live here  
Open space is unaltered natural land  
that surrounds development. **How  
important is Open space to you?**

Green space is natural land, altered  
by humans to make it more visually  
pleasing such as park or more useful  
such as farms and ranches. **How  
important is Green space to you?**

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**Wildlife Value Orientations** – A crude measurement of the general way people view wildlife  
(randomize)

Please tell me if you agree or disagree with  
each of the following statements.

(COMPUTER WILL ADMINISTER  
STATEMENTS IN RANDOM ORDER)  
(INTERVIEWER: READ SCALE AS  
NECESSARY; PROMPT FOR DEGREE)  
(CHECK ONLY ONE ANSWER)

---

Strongly <u>Agree</u>	Moderately <u>Agree</u>	Slightly Agree	<u>Neither</u> <u>agree nor</u> <u>disagree</u>	<u>Slightly</u> <u>Disagree</u>	Moderately <u>Disagree</u>	Strongly <u>Disagree</u>
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Humans should manage fish and wildlife population so that humans benefit

We should strive for a world where humans and wildlife and fish can live side by side without fear

We should strive for a world where there's an abundance of fish and wildlife for hunting and fishing

The needs of humans should take priority over fish and wildlife protection

I view all living things as part of one big family

Animals should have rights similar to the rights of humans

Wildlife are like my family and I want to protect them

Fish and Wildlife are on earth primarily for people to use

Hunting is cruel and inhumane to animals

I care about animals as much as I do other people

People who want to hunt should be provided the opportunity to do so

I value the sense of companionship I receive from animals

Hunting does not respect the lives of animals

I feel a strong emotional bond with animals

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## **Demographics**

Great! We are just about through. The final questions are for background information and help us analyze the results.

What county do you live in?  
(ENTER COUNTY CODE)

Do you consider your place of residence to be a large city or urban area, a suburban area, a small city or town, a rural area on a farm or ranch, or a rural area NOT on a farm or ranch?

(CHECK ONLY ONE ANSWER)

Large city or urban area

Suburban area

Small city or town

Rural area on a farm or ranch

Rural area NOT on a farm or ranch

DNR: Don't know

DNR: Refused



What is the highest level of education you have completed?

(CHECK ONLY ONE ANSWER)

Not a high school graduate

High school graduate or equivalent

Some college or trade school degree

Bachelor's degree

Master's degree

Professional or doctorate degree (e.g., M.D. or Ph.D.)

DNR: Don't know

DNR: Refused

Which of these categories best describes your total household income before taxes last year?

(READ LIST; CHECK ONLY ONE ANSWER)

Under \$20,000

\$20,000-\$39,999

\$40,000-\$59,999

\$60,000-\$79,999

\$80,000-\$99,999

\$100,000-\$119,999

\$120,000 or more

DNR: Don't know

DNR: Refused

May I ask your age?

(ENTER AGE)

That's the end of the survey. Thanks for your time and cooperation.

Gender (OBSERVED, NOT ASKED)