Dominant attitudes and values towards wildlife and the environment in coastal Alabama

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ABSTRACT

Surveys assessing attitudes and values about the environment can help predict human behavior towards wildlife and develop effective conservation goals alongside local communities. Southern Alabama is a hotspot for biodiversity and endemism in the United States and is in need of studies to protect its wildlife. Land and wildlife management practices in Alabama have moved from indigenous-led management, which is more in harmony with the environment, to larger-scale exploitative uses of the environment for agriculture and plantations. We therefore predicted that a large proportion of the population has a dominant view of the environment in which land and wildlife should be used primarily for human benefit. To test this hypothesis, we surveyed over 1,300 residents in Mobile and Baldwin counties – the two southernmost counties in Alabama – to assess attitudes towards local vertebrate wildlife, knowledge of the region's biodiversity, and whether individuals value protected areas where they live and/or work. As hunting is considered a dominant behavior, we used self-identified hunters versus non-hunters to examine the relationship between humans and the environment. Overall, hunters would kill or kill to eat more often than non-hunters, and they would kill even when not for lethal removal or for meat. Furthermore, regardless of hunting status, most participants in our survey would kill a snake, indicating that targeted environmental education is needed for this vertebrate group. Both hunters and non-hunters, independently of demographic differences including education and income levels, were not familiar with the especially rich biodiversity of the area and would not be willing to invest money to protect it. Our results indicate that increasing targeted education about the unique and rich biodiversity of southern Alabama compared to the rest of the US is needed to support successful environmental management, conservation actions, and local participation.

KEYWORDS: Behavior, Conservation, Environmental Education, Human Dimensions, Hunting, South Alabama, Snakes, Survey, Vertebrates

INTRODUCTION

People have different reasons for how they feel about wildlife, including utilitarian value or symbolic meaning, religious or spiritual significance, as a source of fear or attraction, or as a barometer for measuring one's concern over environmental sustainability (Manfredo, 2008). Understanding which values and attitudes individuals have towards wildlife is important for predicting behavior and conservation outcomes (Bath et al., 2022; Jacobs et al., 2014; Kontsiotis et al., 2021; Manfredo et al., 2009; Serenari & Taub, 2019). Attitudinal surveys have been a powerful tool in conservation (Ajzen, 1985; Ajzen, 1991), helping institutions formulate policies and management actions that incorporate local opinions and the likelihood for acceptance and compliance, a key part of conservation success (Karanth et al., 2008). Negative attitudes against wildlife have been shown to undermine conservation initiatives and wildlife sustainability (Mogomotsi et al., 2020).

While attitudinal surveys have been the standard in assessing and predicting behavior towards wildlife for conservation, it is increasingly common to include a quantitative assessment of values about wildlife as a determinant of actions and behaviors (Bennett et al., 2017; Fulton et al., 1996; Manfredo et al., 2017, 2018; Purdy & Decker, 1989; Sutherland et al., 2018). Values represent underlying beliefs that serve as a foundation of actions, while attitudes are context specific motivations behind actions. Values can provide a deeper explanation of human behavior than attitudes alone (Homer & Kahle, 1988). Whereas attitudes are fast-forming and can be adapted to different situations, values are fundamental beliefs that are culturally learned and can transcend specific actions and situations (Dietsch et al., 2017). Values do not directly translate into behavior, as people who hold the same value (e.g., wildlife deserve to be treated humanely) may act differently when encountering wildlife. For example, one individual may not want to harm an

77 animal for any reason, but another may find it acceptable to kill an animal for human benefit if the
78 animal does not experience prolonged suffering (Dietsch et al. 2017). Understanding one's values,
79 in combination with attitudes, can help conservationists decide the best methods of intervening in
80 a conflict situation. Values about wildlife are more difficult to assess than attitudes because the
81 former cannot be measured directly, but rather have to be inferred from statements of belief and
82 expressions of opinion (Purdy & Decker, 1989).

83 Previous studies have quantitatively measured values (e.g., Fulton et al., 1996) and
84 assessed their predictive potential (Jacobs et al., 2014) through the development of scales of value
85 orientations. In the United States, it has become easier to assess both the attitudes and values of
86 Americans quantitatively through a project called "America's Wildlife Values" (Manfredo et al.,
87 2018), in which an individual's wildlife value orientation is determined by where they score on
88 mutualism and domination scales (Teel & Manfredo, 2010). Basic domination beliefs center on
89 hunting and use of wildlife and mutualist beliefs encompass caring and social affiliation.
90 Mutualists tend to see wildlife and the environment as part of their social network and aim to live
91 in harmony with it, while more dominant individuals believe that the environment and wildlife
92 should be used and managed for the benefit of humans (Manfredo et al., 2018).

93 Alabama is one of the states in the US where the environmental outlook of inhabitants has
94 been heavily shaped by European colonialism, with consequent drastic change in the functioning
95 and health of local ecosystems and the wildlife that depend upon them (Whyte, 2018). The Indian
96 Removal Act of 1830 forcibly removed nations across the southeast from their ancestral homelands
97 (Doran, 1975), leading to a large influx of white settlers into the Mississippi River Valley over a
98 very short period. Indigenous people do not see themselves as separate from the land, but rather as
99 a part of it, in turn shaping their land management strategies (Whyte, 2018). Globally, indigenous

lands store 17% of the world's forest carbon due to land management practices (Garnett et al., 2018) and harbor more biodiversity than the world's protected areas (Schuster et al., 2019) The swift demographic change that occurred in Alabama during the European colonization rapidly and fundamentally shifted the wildlife value orientation from mutualism to traditionalism, which scores high on the domination scale (Manfredo et al., 2018). Alabama now has a higher percentage of traditionalists (42%) than the country as a whole (28%) (Dietsch et al., 2018). Mutualists make up only 22% of the population of Alabama versus 35% in the US overall (Dietsch et al., 2018). Thus, nearly half of Alabamians likely hold a dominant mindset over natural resources. This is further supported by 31% of individuals from Alabama indicating that they have hunted in the last twelve months and 35% indicating that they plan to hunt in the future (Dietsch et al., 2018), versus 23% and 16% for those same categories nationwide (Manfredo et al., 2018). Although hunting in Alabama has been shown to be undertaken for many reasons including connecting to nature, socializing, managing deer populations, and as a source of local meat (Birdsong et al., 2021; Mehmood et al., 2003), hunting is a traditionalist activity that falls firmly in the domination scale.

In this study, we test the prediction that Alabamians should exhibit a greater domination mindset over the environment compared to the national average. We carried out a survey in two populous counties that form the Gulf coast of Alabama – Mobile and Baldwin counties (Figure 1) – to assess knowledge, values, and attitudes towards the area and its non-marine wild vertebrates. The survey results are analyzed according to demographic data collected, hunter status (hunter vs. non-hunter), and possession of pets, as we note that people who have pets may view wildlife as a threat to those pets and act differently (Bowes et al., 2015; Frank, 2016; Lute et al., 2016). The study area is particularly rich in biodiversity (Jenkins et al., 2015), especially surrounding the Mobile-Tensaw Delta, harboring several endemic species (e.g., Buhlmann et al., 2009; Moreno et

al., 2022). Climate change and increased urbanization are predicted to strongly affect coastal areas and wetlands on the Gulf of Mexico (Anderson et al., 2013; Darrow et al., 2017; Mulholland et al., 1997; Rabalais et al., 2007; Scavia et al., 2002) and have consequences for the native flora and fauna.

Despite the incredible diversity harbored in southern Alabama, management and conservation of both land and wildlife needed to protect native species and their habitats (Dixon et al., 2016; Falk & Millar, 2016; Scavia et al., 2002) are often hampered by individual actions and attitudes (Hare et al., 2021; Marshall et al., 2007). Therefore, successful conservation actions cannot occur without a proper evaluation of stakeholders' attitudes and values towards those actions (Fox & Bekoff, 2011; Heneghan & Morse, 2018; Lee, 2017; Manfredo et al., 2021; Treves et al., 2009). Our work will provide information on how much people in southern Alabama know of and value the diversity of the area in which they live and their general attitude towards vertebrate wildlife. These data will help to determine whether individuals would be supportive, and therefore increase the success, of conservation actions (Bruskotter et al., 2015; Jordan et al., 2020; Kansky et al., 2016; Marshall et al., 2007) in the area and whether education about the natural environment and its value should be developed for outreach activities and in the classroom to improve literacy about human-wildlife interactions.

METHODS

Data collection

We developed a survey with a total of 12 questions, some of which contained sub-questions. The survey is available as Supplementary Materials. The focus of the survey was to assess if people are familiar with the biodiversity of the area where they live/work, how much they

146 value the protection of this area, how much they would be willing to invest in its protection, and
147 their attitudes toward wildlife. Specifically, the survey focused on attitudes toward non-marine
148 wild vertebrates (hereafter referred to as "vertebrates"), which includes both terrestrial and some
149 freshwater vertebrates (fish were not included in our survey). An initial question (Q1) asked if the
150 individual had previously taken the survey; in this case, the survey was retained only if they
151 answered "no".

152 The survey included four categories of questions. Category 1 (Q2-7 and Q9-10): questions
153 that gather information about the participants and their familiarity with vertebrates in their area.
154 This included the vertebrates that someone would normally see in their daily life and how many
155 vertebrates they see on average during a given week. We also inquired if the person has any pets
156 or if they do any outdoor activities, as this may increase the chance to have encounters with wild
157 animals and influence an individual's attitude towards them. Category 2 (Q8): hunting-related
158 questions, including if the participant hunts, what they hunt, and what they use to hunt. Category
159 3 (Q12): demographic questions including zip code, gender, age, annual income, highest level of
160 school, zip code, and school (if a child). We note our shortcoming in only identifying two genders
161 – females and males – although people could decide to not respond to this question if they
162 identified with neither of the two. Category 4 (Q11): questions assessing the attitudes of people
163 towards wild vertebrates and the value they give to the area of study and its protection. This
164 included types of responses to encounters with vertebrate wildlife, if the response changed
165 depending on which animal was encountered, how well they know the biodiversity of the area, and
166 how much the individual would be willing to monetarily invest to increase protection of nature in
167 the Mobile/Baldwin counties area of Alabama. Questions were developed based on experiences
168 and conversations that some study authors had with students and citizens about how much they

knew about the biodiversity of the area in which they lived, how interested they were in preserving it, and whether some of them regularly hunt for food.

Surveys were distributed as paper copies at schools, cafes, supermarkets, flea markets, gas stations, gyms, shops, hospitals, natural parks and areas, and the University of South Alabama campus in Mobile, Alabama. We targeted different neighborhoods, age groups, and areas to obtain a sample that reflected the diversity of people living in Mobile and Baldwin counties. Paper copies were never left unattended and personally handed to everyone taking the survey. The survey was also distributed electronically through a website hosted by the University of South Alabama and accessible to everyone including those not affiliated with the University. Surveys were carried out between September 2017 and July 2018. Following survey collection, demographic responses were then compared to the demographics present in the 2020 US Census for the state of Alabama, and Mobile and Baldwin counties (U.S. Census Bureau, 2020). All data collected from this survey will be available after manuscript acceptance.

Data analysis

All surveys were reviewed to ensure that responses were real by flagging individuals who always checked the same option (e.g., always first or last responses), took the survey multiple times, stopped taking the survey halfway, did not answer more than half of the questions, or wrote nonsense (e.g., they regularly see dinosaurs) in some of the open answers.

Analyses were run to investigate the relationship between hunter status (Q8.1 in the survey) and the attitude toward different wild animals (Q11). We first built two-way contingency tables for each wild animal to show the distribution of counts for the two categorical variables of hunter status and reaction. We used Chi-square and Fisher's exact tests in R v4.1.2 (R Core Team, 2021)

to test whether the distributions of reactions were significantly different between hunters and non-hunters. We also ran the analysis using gender, demographic information, pet ownership, and whether individuals spent time doing outdoor activities (regardless of whether they hunted or not) as factors that could influence the response. The analyses were also repeated using a reduced model where reaction levels with less than 5 entries were removed from the tests. Following the above approach, we also tested if hunters differed from non-hunters in terms of knowledge of the biodiversity of the area (Q11.29), if they think more should be invested in protecting the Mobile-Tensaw Delta (Q11.30), and how much they would invest in protecting this unique area (Q11.31). The analyses were run using demographic information, pet ownership status, and if they spend time doing outdoor activities as factors. As results from the Chi-square and Fisher's exact tests were always in agreement, we report only results based on the Fisher's test for the full model and the Chi-square test for the reduced model, as the Fisher's test performs better for the full model in the presence of small counts (<5). In addition, to test how well attitudes can be used to predict values, we use the multinom function from the nnet package (Venables & Riply 2002) in R to run multinomial logistic regression to test whether the participants whose attitudes favored "killing" or "killing to eat" wildlife would have values oriented towards knowing and caring less about the environment and its protection. For Q11.31, responses of willingness to pay $20 or less are combined and treated as less supportive while responses of willingness to pay more than $20 are combined and treated as more supportive.

Data Visualization

Data visualization was performed using Tableau Desktop software, version 2022.1.8. No data manipulation or transformation was performed for visualization purposes except for pivoting

and re-coding the original dataset. Data is visualized across 11 tabs, with each tab featuring a dashboard with a title, one or multiple charts, and large "call out" numbers. Descriptive subtitles are often provided to assist the audience in interpreting the visuals. Hovering over the charts provides additional context. Some dashboards include one or multiple drop-down menus, allowing the dashboard user to make selections and customize the view.

RESULTS

Data and demographic information

All data collected in this survey can be visualized in an interactive tool developed for this study (https://public.tableau.com/app/profile/ylenia.chiari/viz/WeberHerteletal__16599728420070/1Demographics-AtGlance) and are also available as Supplementary Materials. Our final dataset consisted of 1,307 survey entries. The total combined population of Mobile and Baldwin counties according to the 2020 US Census is 636,444 (U.S. Census Bureau, 2020). Therefore, our survey represents 0.2% of the population of those counties. The majority (66%) of individuals taking our survey identified as female. The most common age ranges of people who responded were from 13-19 (33%) and 20-30 (25%) years old. According to the US census, females make up 52% of residents on average in Mobile and Baldwin counties, with 53% of residents between the ages of 18 and 65 years (U.S. Census Bureau, 2020). This shows that our survey respondent demographics had a slightly higher representation of females than males, but similar representation of individuals 18-20 to 60-65 in comparison to the US Census.

Most respondents had a college degree (38%) or a high school diploma (24%), while 86% of participants had a high school diploma or higher and 53% had a bachelor's degree or higher.

The US Census indicates that 88.7% of residents over the age of 25 in Mobile and Baldwin counties hold a high school diploma or higher, and 28% of residents hold a bachelor's degree or higher (U.S. Census Bureau, 2020). Thus, our survey respondent demographics were similar to the US Census for those who have at least a high school diploma but are overrepresented for those with a bachelor's degree or higher.

The proportion of respondents was almost equally distributed across the following three annual household income categories (Q12.6): <$30K (14.8%), $30-70K (18%), and >$90K (15.2%); a lower number of the participants (5.5%) were in the $70-90K category and 24% did not answer this question. In our survey, 15% of the participants are considered to live in poverty, earning less than $30K per year.

Among survey respondents, 1,000 (77%) identified as non-hunters, 265 (20%) as hunters, and the remainder (3%) did not respond to this question (Q8.1). Hunters were almost equally represented by males (53%) and females (46%). Most hunters were in the 13-19 (40%) and 20-30 (26%) age ranges, which is a similar breakdown to the age stratification in the survey as a whole. Thirty-six percent of the hunters in our survey had a 4-yr college degree, while a smaller percentage had either a middle or junior high school degree (24%) or a high school degree (22%). Finally, although 30% of hunters did not respond to the question about income, those who answered had very different incomes, with the two largest annual income categories being below $30K (13%) or above $90K (17%). Pet ownership status was very similar in terms of the type of pet owned between hunters and non-hunters, although a higher percentage of hunters than non-hunters had at least one pet (85% versus 75%, respectively), and overall, more hunters had dogs than non-hunters (80% versus 64%, respectively). Data visualization Tabs 1-4 show the complete demographic break down described above.

Attitude towards wildlife

When people were asked how they would react to seeing different wild animals (Q11.1-Q11.28), there was a significant difference in the reaction between hunters and non-hunters for all animals ($p<0.05$) except for salamanders (Table 1, Figure 2, and Data Visualization Tabs 5-7). Although both hunters and non-hunters would tend to either ignore or observe most encountered animals, a larger percentage of hunters than non-hunters answered "kill" (65% vs. 17%, respectively; Chi-square = 217.7, df = 1, $p<0.05$) or "kill to eat" (71% vs. 5.7%, respectively; Chi-square = 530.38, df = 1, $p<0.05$) to at least one type of animal (Figure 2, Data Visualization Tab 7). Furthermore, when the encountered animal is considered "dangerous" such as an alligator, a bear, a cougar, a boar, or a snake, the majority of non-hunters would run away, while the majority of hunters would "observe" it (alligator and bear), "run away" (cougar), "kill" (snake), or "kill to eat" (boar) (Data Visualization Tabs 5 and 6). The number of hunters responding that they would "kill" or "kill to eat" strongly depended on the type of animal encountered. Responses of "kill" and "kill to eat" were around 3% for lizards, salamanders, owls, turtles, heron and egrets, but reached greater than 30% for animals that are commonly eaten (e.g., dear, boar) and snakes (Data Visualization Tab 5). Overall, the percentage of non-hunters that would "kill" or "kill to eat" an animal was less variable, generally being 5% or lower depending on the encountered animal; however, this percentage increases to 14% of non-hunters when the animal is a snake (Data Visualization Tab 5). Correspondingly, 46% of total participants (hunters and non-hunters) indicated that they would "kill" (44%) or "kill to eat" (1%) a snake (Data Visualization Tab 5). Finally, 27% of all respondents answered "kill" as an attitude towards animals at least once, 13% answered "kill" more than once, 19% answered "kill to eat" at least once, and 14% answered "kill

to eat" more than once. Therefore around 46% of the participants, regardless of hunting status, answered that they would kill an animal (to eat or just to kill) at least once (Data Visualization Tab 7), and 27% of all responded would "kill" or "kill to eat" more than once.

When attitudes towards wildlife were analyzed taking into account demographic information and participation in outdoor activities regardless of hunting status, we found that gender, age range, education, income, and type of activity performed outdoors were significant ($p<<0.05$) factors influencing the reaction to all wild animals except for responses to owls and seagulls by gender and armadillos by level of education (Table 2). Across demographic categories and animals, the most common response was to observe; however, there were differences among demographic groups when responding "kill" and/or "kill to eat". More males than females would "kill" (35% vs. 23%, respectively) or "kill to eat" (27% vs. 14%, respectively). Across every income category, more than 20% of people answered "kill" at least once; but answering "kill to eat" was more prominent for incomes >$70K (21% for income between $70K-90K and 19% for income >$90K). Finally, 36% of respondents in middle or junior high school would also "kill" and "kill to eat", which was higher than any of the other educational categories. Further details and breakdown of responses by demographic categories and animals can be seen on Data Visualization Tab 6.

Knowledge and value of the area

Hunters and non-hunters did not differ in the number of vertebrates observed on average per week (Q7.1 and Q8.1) ($p= 0.33$) but did differ in their knowledge of the area (Chi-square test, $p = 0.0002$) (Q11.29, Data Visualization Tab 8). Although many hunters and non-hunters responded that Mobile/Baldwin counties had a similar level of biodiversity (i.e., number of wild animals) as other

places in the US (Q11.29; 56% hunters, 42% non-hunters), more non-hunters (38%) than hunters (26%) answered that they did not know. A lower percentage of individuals in both groups (20% non-hunters vs. 17% hunters) recognized this area as having a different level of biodiversity (higher or lower) than the rest of the US (Data Visualization Tab 8).

When individuals were asked whether the number of protected areas in Mobile/Baldwin counties should increase, decrease, or stay the same (Q11.30), significantly (Chi-square, $p < 0.0001$) more non-hunters (56%) compared to hunters (43%) favored increasing protected areas, while more hunters (5%) than non-hunters (0.7%) would opt to decrease protected areas. Lastly, more hunters (33%) than non-hunters (22%) preferred to keep protected areas the same (Data Visualization Tab 10). When people were asked how much they would be willing to pay per year to maintain or increase protected areas (Q11.31), there was no significant difference between hunters and non-hunters ($p = 0.05$). The majority of both groups (55% of hunters vs. 51% of non-hunters) responded either that they would not be willing to invest money or would invest very little (maximum $10 per year) to protect these areas (Data Visualization Tab 10).

Females and males tended to observe similar numbers of animals in a week (Q7.1 and Q12.1, $p=0.06$) (Data Visualization Tab 9). When people were asked about the level of biodiversity of the area compared to other places in the US (Q11.29), we found a significant ($p=0.003$) difference in response between females and males. More females (39%) than males (28%) answered that they did not know, while less females (42%) than males (50%) responded “yes” to this question. We also found that genders differed in the number of protected areas desired, with 56% of females responding “increase” versus 47% of males ($p=0.0001$, Q11.30), with females willing to pay more to maintain or increase these areas than males ($p=0.03$, Q11.31) (Data Visualization Tab 11).

The age range of people taking the survey (Q12.2) influenced the number of vertebrates seen on average per week (Q7.1) ($p = 0.001$) and what they know about the area (Q11.29, $p = 0.02$). Within each age category, around 80% of participants responded that the study area has a similar number of wild animals to the rest of the US or that they did not know (Data Visualization Tab 9). Age also significantly influenced how people feel about protected areas in Mobile/Baldwin counties (Q11.30, $p = 0.001$) and how much they are willing to invest for its protection (Q11.31, $p= 0.0001$) (Data Visualization Tab 11).

We found that people with different levels of education (Q12.5) also saw different numbers of vertebrate animals per week on average (Q7.1) ($p=0.008$) and differed in their knowledge of the diversity of the study area compared to the rest of the US (Q11.29, $p=0.0002$) (Data Visualization Tab 9). Across all educational categories, ≥60% of participants responded either that the level of biodiversity in the study area is the same as in other places in the US or that they didn't know, although a higher proportion of people with a PhD (33%) answered that the level of biodiversity was different. Education also influenced the amount of desired protected areas ($p= 0.001$, Q11.30): although the majority in each educational category indicated that they would increase protected areas, the percentage was higher for people in graduate school (>60%) compared to other categories. Education also influenced how much participants are willing to invest for these protected areas ($p=0.002$, Q11.31) (Data Visualization Tab 11).

Finally, income significantly affected how many animals people saw on average per week (Q7.1, $p= 0.0004$), how much they know about the area (Q11.29, $p = 0.03$), how much protected area they prefer (Q11.30, $p= 0.0001$), and how much they would be willing to invest in its protection (Q11.31, $p= 0.0001$) (Data Visualization Tab 9). Within each income category, around 80% of participants indicated that the study area is similar in biodiversity to the rest of the US or

353 that did not know. Furthermore, while ≥50% of participants within each income category
354 suggested to increase protected areas, a higher proportion of individuals with income ≥$91K (27%)
355 desired to keep it the same. A higher proportion of participants earning ≥$70K (26-27%) also
356 indicated that they would be willing to spend nothing for protection (versus approximately 20% in
357 other income categories).
358
359 ***Relationship between attitude towards wildlife and knowledge and value of the area***
360 We tested whether a more dominant attitude towards wildlife (Qs 11.1-11.28) was associated with
361 knowing and caring less about the environment and its protection (Qs 11.29-11.31). We found no
362 relationship between those answering "kill" or "kill to eat" and knowledge of their area's level of
363 biodiversity (Q11.29, p=0.75). This result does not change when hunting status was considered
364 (p=0.34). However, answering "kill" or "kill to eat" tended to increase the probability of answering
365 "decrease" to the amount of desired protected areas (Q11.30, p= 0.03). Furthermore, when hunting
366 status was considered, non-hunters were 13% less likely to answer "decrease" than hunters
367 (p=0.0004). We found that answering "kill" or "kill to eat" (Qs 11.1-11.28) did not influence how
368 much the participants would be willing to invest to protect the area (Q11.31, p=0.55), and this
369 result did not change when analyzing hunters and non-hunters separately (p=0.9).
370
371 **DISCUSSION**
372 We collected information on attitudes and values about local wildlife from 1,307
373 individuals in Mobile and Baldwin counties in southern Alabama, which represents approximately
374 0.2% of the combined population of these counties. We had more than double the number of
375 participants than a statewide study of wildlife value orientations in Alabama (Dietsch et al., 2018),

indicating the strength of our sample. The demographics of participants in this survey largely reflected those reported in other studies. In general, females were more likely to respond than males (Curtin et al., 2000; Moore & Tarnai, 2002; Singer et al., 2000), younger people were more likely to respond than older people (Goyder, 1986; Moore & Tarnai, 2002), and more educated and more affluent individuals were more likely to respond than less educated and less affluent individuals (Curtin et al., 2000; Goyder et al., 2002; Singer et al., 2000). However, our survey had fewer self-identified hunters compared to a previous statewide study of Alabama (Dietsch et al., 2018), although the proportion of male and female hunters and non-hunters in our survey reflects what has been found at the state level.

Dominant attitudes toward wildlife

We based our interpretation of attitudes and values towards and knowledge of wildlife and the environment on the mutualism versus domination framework of Teel & Manfredo (2010) and Manfredo et al. (2018). Specifically, according to this framework, social affiliation (the desire to be in and around nature) and caring for the environment are identified more as mutualism, while hunting and use of wildlife are characteristics of domination (Teel & Manfredo, 2010). Our working hypothesis was that, due to its colonization history, we would find a more dominant attitude for the study area compared to the rest of the US, similar to what has been observed for Alabama as a whole based on America's Wildlife Values (Dietsch et al., 2018).

Hunting is strongly associated with a domination orientation (Teel & Manfredo, 2010). In Alabama, hunters make up 31% of the population (Dietsch et al., 2018), but only 20% of respondents in our study. This discrepancy is likely partly due to the urban landscape of Mobile and surrounding areas, resulting in fewer hunters in our sample. In addition, it is unclear how well

different regions of Alabama were covered in the statewide study (Dietsch et al., 2018). Beyond hunting status, nearly half of all individuals in our study answered "kill" or "kill to eat" for at least one animal, providing further evidence for widespread dominant attitudes in southern Alabama regardless of hunting status. Responding "kill" or "kill to eat" was highest among the youngest ages (5-19 years old) and the most affluent economic groups (>$70K), and did not change with increasing levels of education except individuals with an advanced degree (e.g., Ph.D.).

Given the large proportion of participants, including non-hunters, that answered "kill" or "kill to eat" for at least one animal, we wanted to further understand the drivers of this attitude. Lethal removal of an animal is an example of taking wildlife that is not considered hunting. We surveyed responses to encountering animals that are considered potentially harmful to livestock, humans or pets (i.e., coyote, bear, snake). Of the respondents who said they would either "kill" or "kill to eat" a coyote, 31% were hunters and 2.7% were non-hunters, indicating that hunters also shown a more dominant attitude toward lethal removal. We also asked respondents if they owned pets, which could affect their attitude towards a certain species (Dietsch et al., 2018). According to our survey, hunters and non-hunters had a similar percentage of pet ownership (85% of hunters and 75% of non-hunters), suggesting that having a pet does not explain the large difference observed for lethal responses to coyotes between these two demographic categories. Rather, the domination orientation of hunters is probably a better explanation for this difference, even when killing is not necessarily as a source of meat. Similar results were also obtained when asking about bears.

Conversely, snakes appear to trigger a dominant attitude from both hunters and non-hunters alike. 46% of participants answered "kill" or "kill to eat" a snake. While people are more likely to kill a venomous than a non-venomous snake, they cannot identify the snake species in question

more than half of the time (Vaughn et al., 2022). Although the percentage of respondents answering "kill" or "kill to eat" snakes was higher for hunters than non-hunters in our study (32% vs 13.6%, respectively), our findings reflect a general lethal attitude towards encountering snakes that matches previous research. Attitudes toward snakes have been shown to be independent of the type of snake – venomous or non-venomous – and seems to be driven by general fear or disgust for snakes (Coelho et al., 2021; Crawford & Andrews, 2016; Onyishi et al., 2021). There are over 40 species of snakes that occur in Alabama, and all but six species are non-venomous. Many non-venomous species are often mistaken for venomous species by the general public; one example is the seven species of harmless watersnakes (*Nerodia* spp.) which are often mistaken for venomous Cottonmouths (*Agkistrodon piscivorus*) due to their similar color and banded pattern. Additionally, there are nine snake species that are rare or endangered in Alabama and illegal to capture or kill (Alabama Division of Wildlife and Freshwater Fisheries, 2021). The public's behavior towards snakes clearly has major conservation implications, as snakes are important species for ecosystem function (Willson & Winne, 2016).

Based on our survey, hunters form the vast majority of individuals that would "kill" or "kill to eat" an animal. While snakes draw lethal attitudes from both hunters and non-hunters, once this group of animals is accounted for, hunters responded in much greater percentages compared to non-hunters that they are willing to kill even when it is not as a source of local meat such as a coyote or a bear. Thus, we found that dominant attitudes towards wildlife are heavily skewed towards hunters. These results fit with the statewide study of "America's Wildlife Values" (Dietsch et al. 2018), which showed that only 23% of hunters or anglers surveyed support hunting because it is a source of local food, suggesting that hunting has other utilities or sources of meaning for self-identified hunters.

445

446 ***Knowledge and value of the environment***

447 While much our survey asked questions to assess attitudes towards wildlife, we also asked
448 more value-oriented questions dealing with knowledge of the area and value given to protected
449 areas. These questions asked respondents about their perceptions of the amount of wildlife in
450 Mobile and Baldwin counties in comparison to other places in the United States, whether they
451 thought that the counties should increase, decrease or keep the same amount of protected areas to
452 protect wildlife, and how much they would be willing to pay per year based on their response.
453 Traditionally, the sale of hunting and angling licenses has funded conservation and protection of
454 habitats, but wildlife viewing is a newer activity that has been studied more recently and does not
455 come with a cost (Sinkular et al., 2022). This may influence how much people are willing to spend
456 to protect habitats they are viewing but not actively hunting or fishing in.

457 Survey responses indicated that most participants are not familiar with the uniqueness of
458 the biodiversity of the area compared to the rest of the US, especially young and middle-aged
459 individuals below 60 years old. In addition, most participants across demographic groups are also
460 not willing to invest much (in general nothing or less than $30) to protect it, although our data did
461 show that more non-hunters than hunters favored increasing protected areas. Individuals with at
462 least a 4-year college degree also favored increasing protected areas. Counterintuitively,
463 individuals in higher income groups are less willing to spend money to increase protected areas.
464 Previous studies have not definitively concluded a relationship between wealth and concern for
465 the environment. In climate change research, the wealthy are responsible for the majority of carbon
466 emissions despite their higher level of concern about environment and willingness to pay to protect
467 it (Nauges et al., 2021; Oswald et al., 2020), while lower income individuals have not contributed

nearly as much to environmental crises, but may not say they are very concerned about the environment and are unable to pay more to protect it (Fairbrother, 2013; Franzen & Vogl, 2013).

Our analyses indicated that the dominant attitude of "kill" or "kill to eat" an animal is not a predictor of the knowledge a participant had of the area and of how willing the person would be to invest for its protection. However, the attitude of "kill" or "kill to eat" an animal is a good predictor of the desired amount of protected areas: the more an individual responded "kill" or "kill to eat" to an animal, the less protected areas they would want. This result was independent of hunting status and suggests a strong relationship between a dominant attitude and behavior towards animals and value given to the environment for human use.

Conservation Implications

Overall, we found that most individuals who were supportive of killing animals self-identified as hunters. This dominant attitude goes beyond hunting for meat and includes lethal control of animals or killing for other reasons. Non-hunters, on the other hand, only appear to support lethal removal of snakes, but not other animals. Increased formal education does not appear to decrease the dominant attitude of hunters or non-hunters. Since hunting for food can have important social, health, and economic benefits, a clear conservation goal arising from our study should be targeted education to prevent killing animals for reasons other than as a source of meat. This education should happen at an early age (K-12), as our data shows that it is the youngest groups (middle/high schoolers) that are the most supportive of killing animals either for food or just to kill. Educational programs in schools or camps that bring in federal or state agencies or NGOs to talk about conservation status of different species, their role in ecosystems, and responses to wildlife encounters could go a long way to improving unnecessary lethal removal of animals.

This targeted education would be especially beneficial if it teaches young people to identify and respond appropriately to snakes, coyotes, bears or other wildlife perceived as harmful.

One of our surprising findings was that respondents were overwhelmingly unaware of the unique biodiversity of their region, which could influence their actions towards species as well as their underlying value system. Southern Alabama, including the Mobile-Tensaw Delta, and neighboring areas are among the most biodiverse in the US, containing assemblages of species that rival other biodiversity hotspots around the world. Given that most federally protected areas are in the western US, this lack of knowledge fits with a general shortage of appreciation and protection accorded to the biodiversity of the southeastern US. Communicating to the local population about the types of wildlife that inhabit local spaces and the benefits these species provide can have a positive effect on outcomes when encountering wildlife (e.g., Ballouard et al., 2013; Bermudez et al., 2017; Pinheiro et al., 2016).

While environmental education, especially targeted toward younger ages, could help change behavior towards local wildlife, it may be difficult to influence hunters, especially due to the politics surrounding environmentalism in the US (Blumstein & Saylan, 2007; Dunlap et al., 2001). In Alabama, hunters are already required by law to sign off on and carry each refuge's hunt brochure to legally hunt in that area, which includes which species may be hunted and by what methods (e.g., the brochures located on the Outdoor Alabama website (Wildlife Management Areas, 2021). If hunters are not abiding by the rules outlined by law, it is unlikely that environmental education would affect their choices. This suggests that conservationists could focus additional efforts on protecting species that have been identified as "kill" (rather than "kill to eat") in our survey, which likely represents instances of illegal hunting. The top animals in our survey most frequently marked "kill" were snake, coyote, hog/boar, armadillo, opossum,

514 salamanders, lizards, and alligators. For some of these species, a lethal response may be more out
515 of fear than anything else. While education about these species may help somewhat in changing
516 attitudes of fear to indifference or coexistence, fear can largely come from cognitive and social
517 bias and negative media coverage in addition to lack of education (Lambertucci et al., 2021).
518 Therefore, conservationists should also consider alternative approaches to protecting these species.
519 In order to protect certain species, agencies may need to turn to a financial incentive or
520 financial/legal penalty system. Compensation schemes for landowners to allow species of wildlife
521 to live on their land, for example, have been shown to lead to less lethal control measures of species
522 (Dickman et al., 2011; Johansson et al., 2016; Kontsiotis et al., 2021; Morzillo & Needham, 2015).
523 The Endangered Species Act (United States, 1983) provides legal and financial consequences
524 should a person kill an endangered species and could be relevant in Alabama. For example, the
525 endangered whooping crane (*Grus americana*) now spends winters along the Tennessee River in
526 northern Alabama (Lessard et al., 2018). Two individuals were recently fined $85,000 and
527 sentenced to serve 360 hours of community service for killing two whooping cranes in Louisiana
528 – hopefully a severe enough sentence to deter further shootings in the area (Associated Press,
529 2020). Substantial financial and/or legal consequences for harming wildlife, in combination with
530 financial incentives for coexisting with wildlife, can serve as additional tools to preserve the
531 biodiversity of southern Alabama.
532 The demographics of Alabama have shifted dramatically since the seventeenth century,
533 and so have its population's attitudes and values towards wildlife. However, in these two counties,
534 our survey results show that they are slightly more conservation-minded than the rest of the state
535 on certain topics. By looking at statewide values data and local attitudinal data together, we have
536 been able to see where values can turn into attitudes, and therefore actions. This allows for more

predictive power of how citizens of these counties would respond when seeing wildlife, based on the demographics of the population of the state and county specifically. These tools together can be used in the other 49 states analyzed in the "America's Wildlife Values" report to help predict actions towards wildlife and conservation, and base management and education opportunities on those predictions. This study shows that those in Mobile and Baldwin counties are largely not hunters, where hunters are much more common on a state level. This knowledge can help inform how to create coexistence strategies between people and wildlife, which may differ even one county over. Assessing the values of and attitudes towards wildlife in general can have big implications for success on a local level and should be investigated before management action is taken to prevent conflict.

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AUTHOR CONTRIBUTIONS

Thought of the project: YC, SG; Developed the questionnaire: YC, SG, AS, SJ; Collected the data: KA, HH, AH, NK, SG, YC; Analyzed the data: BH, AYW, BW; Data visualization: JS; Wrote the paper: SWH, SG, YC; Provided comments on the paper: AH, AS, AYW, BW.

REFERENCES

Ajzen, I. (1985). From intentions to actions: A Theory of planned behavior. In J. Kuhl & J. Beckmann (Eds.), Action Control: From Cognition to Behavior (pp. 11–39). Springer. https://doi.org/10.1007/978-3-642-69746-3_2

Ajzen, I. (1991). The theory of planned behavior. Organizational Behavior and Human Decision Processes, 50(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T

Alabama Division of Wildlife and Freshwater Fisheries. (2021). Alabama regulations relating to game, fish, furbearers and other wildlife 2021-2022. Alabama Department of Conservation and Natural Resources. https://www.outdooralabama.com/sites/default/files/Enforcement/2021-2022%20REGULATION%20BOOK%20Final%209.29.21.pdf

Anderson, J., Wallace, D., Simms, A., Rodriguez, A., & Milliken, K. (2013). Variable response of coastal environments of the northwestern Gulf of Mexico to sea-level rise and climate change: Implications for future change. Marine Geology, 352, 348–366. https://doi.org/10.1016/j.margeo.2013.12.008

Associated Press. (2020, July 31). Judge orders man to pay $85K in deaths of 2 whooping cranes. ABC News. https://abcnews.go.com/US/wireStory/judge-orders-man-pay-85k-deaths-whooping-cranes-72110494

Ballouard, J.-M., Ajtic, R., Balint, H., Brito, J. C., Crnobrnja-Isailovic, J., Desmonts, D., ElMouden, E. H., Erdogan, M., Feriche, M., Pleguezuelos, J. M., Prokop, P., Sánchez, A., Santos, X., Slimani, T., Tomovic, L., Uşak, M., Zuffi, M., & Bonnet, X. (2013). Schoolchildren and one of the most unpopular animals: Are they ready to protect snakes? Anthrozoös, 26(1), 93–109. https://doi.org/10.2752/175303713X13534238631560

583 Bath, A. J., Engel, M. T., van der Marel, R. C., Kuhn, T. S., & Jung, T. S. (2022). Comparative
584 views of the public, hunters, and wildlife managers on the management of reintroduced bison
585 (Bison bison). Global Ecology and Conservation, 34, e02015.
586 https://doi.org/10.1016/j.gecco.2022.e02015
587 Bennett, N. J., Roth, R., Klain, S. C., Chan, K., Christie, P., Clark, D. A., Cullman, G., Curran, D.,
588 Durbin, T. J., Epstein, G., Greenberg, A., Nelson, M. P., Sandlos, J., Stedman, R., Teel, T. L.,
589 Thomas, R., Veríssimo, D., & Wyborn, C. (2017). Conservation social science:
590 Understanding and integrating human dimensions to improve conservation. Biological
591 Conservation, 205, 93–108. https://doi.org/10.1016/j.biocon.2016.10.006
592 Bermudez, G. M. A., Battistón, L. V., García Capocasa, M. C., & De Longhi, A. L. (2017).
593 Sociocultural variables that impact high school students' perceptions of native fauna: A study
594 on the species component of the biodiversity concept. Research in Science Education, 47(1),
595 203–235. https://doi.org/10.1007/s11165-015-9496-4
596 Birdsong, M., Morse, W., Steury, T., & Smith, M. (2021). Socialization and motivational pathways
597 among different groups of non-traditional hunters in Alabama reveal unique recruitment and
598 retention opportunities. Human Dimensions of Wildlife, 0(0), 1–15.
599 https://doi.org/10.1080/10871209.2021.1954266
600 Blumstein, D. T., & Saylan, C. (2007). The failure of environmental education (and how we can
601 fix it). PLoS Biology, 5(5), e120. https://doi.org/10.1371/journal.pbio.0050120
602 Bowes, M., Keller, P., Rollins, R., & Gifford, R. (2015). Parks, dogs, and beaches: Human-wildlife
603 conflict and the politics of place. In N. Carr (Ed.), Domestic Animals and Leisure (pp. 146–
604 171). Palgrave Macmillan UK. https://doi.org/10.1057/9781137415547_8
605 Bruskotter, J. T., Singh, A., Fulton, D. C., & Slagle, K. (2015). Assessing tolerance for wildlife:

606 Clarifying relations between concepts and measures. Human Dimensions of Wildlife, 20(3),
607 255–270. https://doi.org/10.1080/10871209.2015.1016387
608 Buhlmann, K. A., Akre, T. S. B., Iverson, J. B., Karapatakis, D., Mittermeier, R. A., Georges, A.,
609 Rhodin, A. G. J., van Dijk, P. P., & Gibbons, J. W. (2009). A global analysis of tortoise and
610 freshwater turtle distributions with identification of priority conservation areas. Chelonian
611 Conservation and Biology, 8(2), 116–149. https://doi.org/10.2744/CCB-0774.1
612 Carroll, C., & Noss, R. F. (2020). Rewilding in the face of climate change. Conservation Biology,
613 35, 155–167. https://doi.org/10.1111/cobi.13531
614 Coelho, C. M., Polák, J., Suttiwan, P., & Zsido, A. N. (2021). Fear inoculation among snake
615 experts. BMC Psychiatry, 21(1), 539. https://doi.org/10.1186/s12888-021-03553-z
616 Crawford, B. A., & Andrews, K. M. (2016). Drivers' attitudes toward wildlife-vehicle collisions
617 with reptiles and other taxa. Animal Conservation, 19(5), 444–450.
618 https://doi.org/10.1111/acv.12261
619 Curtin, R., Presser, S., & Singer, E. (2000). The effects of response rate changes on the index of
620 consumer sentiment. Public Opinion Quarterly, 64(4), 413–428.
621 https://doi.org/10.1086/318638
622 Darrow, E. S., Carmichael, R. H., Calci, K. R., & Burkhardt III, W. (2017). Land-use related
623 changes to sedimentary organic matter in tidal creeks of the northern Gulf of Mexico.
624 Limnology and Oceanography, 62(2), 686–705. https://doi.org/10.1002/lno.10453
625 Dickman, A. J., Macdonald, E. A., & Macdonald, D. W. (2011). A review of financial instruments
626 to pay for predator conservation and encourage human–carnivore coexistence. Proceedings
627 of the National Academy of Sciences, 108(34), 13937–13944.
628 https://doi.org/10.1073/pnas.1012972108

Dietsch, A. M., Don Carlos, A., Manfredo, M. J., Teel, T. L., & Sullivan, L. (2018). State report for Alabama from the research project entitled “America’s Wildlife Values.” Colorado State University, Department of Human Dimensions of Natural Resources.

Dietsch, A. M., Manfredo, M. J., & Teel, T. L. (2017). Wildlife value orientations as an approach to understanding the social context of human-wildlife conflict. In C. M. Hill, A. D. Webber, & N. E. C. Priston (Eds.), Understanding Conflicts about Wildlife (1st ed., Vol. 9, pp. 107–126). Berghahn Books; JSTOR. https://doi.org/10.2307/j.ctvw04h12.11

Dixon, S. J., Sear, D. A., Odoni, N. A., Sykes, T., & Lane, S. N. (2016). The effects of river restoration on catchment scale flood risk and flood hydrology. Earth Surface Processes and Landforms, 41(7), 997–1008. https://doi.org/10.1002/esp.3919

Dunlap, R. E., Xiao, C., & McCright, A. M. (2001). Politics and environment in America: Partisan and ideological cleavages in public support for environmentalism. Environmental Politics, 10(4), 23–48. https://doi.org/10.1080/714000580

Falk, D. A., & Millar, C. I. (2016). The influence of climate variability and change on the science and practice of restoration ecology. In M. A. Palmer, J. B. Zedler, & D. A. Falk (Eds.), Foundations of Restoration Ecology (pp. 484–513). Island Press/Center for Resource Economics. https://doi.org/10.5822/978-1-61091-698-1_17

Fargione, J. E., Bassett, S., Boucher, T., Bridgham, S. D., Conant, R. T., Cook-Patton, S. C., Ellis, P. W., Falcucci, A., Fourqurean, J. W., Gopalakrishna, T., Gu, H., Henderson, B., Hurteau, M. D., Kroeger, K. D., Kroeger, T., Lark, T. J., Leavitt, S. M., Lomax, G., McDonald, R., … Griscom, B. W. (2018). Natural climate solutions for the United States. Science Advances, 4(11), eaat1869–eaat1869. https://doi.org/10.1126/sciadv.aat1869

Fox, C. H., & Bekoff, M. (2011). Integrating values and ethics into wildlife policy and

management: Lessons from North America. Animals, 1(1), 126–143. https://doi.org/10.3390/ani1010126

Frank, B. (2016). Human–wildlife conflicts and the need to include tolerance and coexistence: An introductory comment. Society & Natural Resources, 29(6), 738–743. https://doi.org/10.1080/08941920.2015.1103388

Fulton, D. C., Manfredo, M. J., & Lipscomb, J. (1996). Wildlife value orientations: A conceptual and measurement approach. Human Dimensions of Wildlife, 1(2), 24–47. https://doi.org/10.1080/10871209609359060

Garnett, S. T., Burgess, N. D., Fa, J. E., Fernández-Llamazares, Á., Molnár, Z., Robinson, C. J., Watson, J. E. M., Zander, K. K., Austin, B., Brondizio, E. S., Collier, N. F., Duncan, T., Ellis, E., Geyle, H., Jackson, M. V., Jonas, H., Malmer, P., McGowan, B., Sivongxay, A., & Leiper, I. (2018). A spatial overview of the global importance of Indigenous lands for conservation. Nature Sustainability, 1(7), 369–374. https://doi.org/10.1038/s41893-018-0100-6

Goyder, J. (1986). Surveys on surveys: Limitations and potentialities. The Public Opinion Quarterly, 50(1), 27–41.

Goyder, J., Warriner, K., & Miller, S. (2002). Evaluating socio-economic status (SES) bias in survey nonresponse. Journal of Official Statistics, 18(1), 1–11.

Heneghan, M. D., & Morse, W. (2018). Finding our bearings: Understanding public attitudes toward growing black bear populations in Alabama. Human Dimensions of Wildlife, 23(1), 54–70. https://doi.org/10.1080/10871209.2017.1386248

Homer, P. M., & Kahle, L. R. (1988). A structural equation test of the value-attitude-behavior hierarchy. Journal of Personality and Social Psychology, 54(4), 638–646. https://doi.org/10.1037/0022-3514.54.4.638

675 Jacobs, M. H., Vaske, J. J., & Sijtsma, M. T. J. (2014). Predictive potential of wildlife value
676 orientations for acceptability of management interventions. Journal for Nature Conservation,
677 22(4), 377–383. https://doi.org/10.1016/j.jnc.2014.03.005
678 Jenkins, C. N., Houtan, K. S. V., Pimm, S. L., & Sexton, J. O. (2015). US protected lands mismatch
679 biodiversity priorities. Proceedings of the National Academy of Sciences, 112(16), 5081–
680 5086. https://doi.org/10.1073/pnas.1418034112
681 Johansson, M., Ferreira, I. A., Støen, O.-G., Frank, J., & Flykt, A. (2016). Targeting human fear
682 of large carnivores—Many ideas but few known effects. Biological Conservation, 201, 261–
683 269. https://doi.org/10.1016/j.biocon.2016.07.010
684 Jordan, N. R., Smith, B. P., Appleby, R. G., Eeden, L. M. van, & Webster, H. S. (2020). Addressing
685 inequality and intolerance in human–wildlife coexistence. Conservation Biology, 34(4), 803–
686 810. https://doi.org/10.1111/cobi.13471
687 Kansky, R., Kidd, M., & Knight, A. T. (2016). A wildlife tolerance model and case study for
688 understanding human wildlife conflicts. Biological Conservation, 201(C), 137–145.
689 https://doi.org/10.1016/j.biocon.2016.07.002
690 Karanth, K., Kramer, R., Qian, S., & Christensen, N. (2008). Examining conservation attitudes,
691 perspectives, and challenges in India. Biological Conservation, 141, 2357–2367.
692 https://doi.org/10.1016/j.biocon.2008.06.027
693 Keesstra, S., Nunes, J., Novara, A., Finger, D., Avelar, D., Kalantari, Z., & Cerdà, A. (2018). The
694 superior effect of nature based solutions in land management for enhancing ecosystem
695 services. The Science of the Total Environment, 610–611, 997–1009.
696 https://doi.org/10.1016/j.scitotenv.2017.08.077
697 Kontsiotis, V. J., Triantafyllidis, A., Telidis, S., Eleftheriadou, I., & Liordos, V. (2021). The

predictive ability of wildlife value orientations for mammal management varies with species conservation status and provenance. Sustainability, 13(20), 11335. https://doi.org/10.3390/su132011335

Lambertucci, S. A., Plaza, P., & Speziale, K. (2021). Minimizing fear of wildlife in urban areas. Science, 374(6570), 947–947. https://doi.org/10.1126/science.abm6560

Lee, P. C. (2017). People, perceptions and 'pests': Human-wildlife interactions and the politics of conflict. In C. M. Hill, A. D. Webber, & N. E. C. Priston (Eds.), Understanding conflicts about wildlife (1st ed., Vol. 9, pp. 15–35). Berghahn Books; JSTOR. https://doi.org/10.2307/j.ctvw04h12.6

Lessard, S. K., Morse, W. C., Lepczyk, C. A., & Seekamp, E. (2018). Perceptions of whooping cranes among waterfowl hunters in Alabama: Using specialization, awareness, knowledge, and attitudes to understand conservation behavior. Human Dimensions of Wildlife, 23(3), 227–241. https://doi.org/10.1080/10871209.2017.1414335

Lute, M. L., Navarrete, C. D., Nelson, M. P., & Gore, M. L. (2016). Moral dimensions of human–wildlife conflict. Conservation Biology, 30(6), 1200–1211. https://doi.org/10.1111/cobi.12731

Manfredo, M. J. (2008). Who cares about wildlife? Social science concepts for exploring human-wildlife relationships and conservation issues. Springer.

Manfredo, M. J., Berl, R. E., Teel, T. L., & Bruskotter, J. T. (2021). Bringing social values to wildlife conservation decisions. Frontiers in Ecology and the Environment, 19(6), 355–362. https://doi.org/10.1002/fee.2356

Manfredo, M. J., Sullivan, L., Dietsch, A. M., Teel, T. L., Bright, A. D., & Bruskotter, J. (2018). America's wildlife values: The social context of wildlife management in the U.S. National

721 report from the research project entitled “America’s wildlife values.” Colorado State
722 University, Department of Human Dimensions of Natural Resources.
723 https://sites.warnercnr.colostate.edu/wildlifevalues/wp-
724 content/uploads/sites/124/2019/01/AWV-National-Final-Report.pdf
725 Manfredo, M. J., Teel, T. L., & Henry, K. L. (2009). Linking society and environment: A
726 multilevel model of shifting wildlife value orientations in the western United States. Social
727 Science Quarterly, 90(2), 407–427. https://doi.org/10.1111/j.1540-6237.2009.00624.x
728 Manfredo, M. J., Teel, T. L., Sullivan, L., & Dietsch, A. M. (2017). Values, trust, and cultural
729 backlash in conservation governance: The case of wildlife management in the United States.
730 Biological Conservation, 214, 303–311. https://doi.org/10.1016/j.biocon.2017.07.032
731 Marshall, K., White, R., & Fischer, A. (2007). Conflicts between humans over wildlife
732 management: On the diversity of stakeholder attitudes and implications for conflict
733 management. Biodiversity and Conservation, 16(11), 3129–3146.
734 https://doi.org/10.1007/s10531-007-9167-5
735 Mehmood, S., Zhang, D., & Armstrong, J. (2003). Factors associated with declining hunting
736 license sales in Alabama. Human Dimensions of Wildlife, 8(4), 243–262.
737 https://doi.org/10.1080/716100423
738 Mogomotsi, P. K., Mogomotsi, G. E. J., Dipogiso, K., Phonchi-Tshekiso, N. D., Stone, L. S., &
739 Badimo, D. (2020). An analysis of communities’ attitudes toward wildlife and implications
740 for wildlife sustainability. Tropical Conservation Science, 13, 1940082920915603.
741 https://doi.org/10.1177/1940082920915603
742 Moore, D. L., & Tarnai, J. (2002). Evaluating nonresponse error in mail surveys. In R. M. Groves,
743 D. A. Dillman, J. L. Eltinge, & J. A. Little (Eds.), Survey nonresponse (pp. 197–211). John

744 Wiley & Sons.
745 Moreno, N., Heaton, A., Bruening, K., Milligan, E., Nelson, D., Glaberman, S., & Chiari, Y.
746 (2022). Hybridization and low genetic diversity in the endangered Alabama red-bellied turtle
747 (Pseudemys alabamensis). Ecology and Evolution, 12, e8964.
748 https://doi.org/10.1002/ece3.8964
749 Morzillo, A. T., & Needham, M. D. (2015). Landowner incentives and normative tolerances for
750 managing beaver impacts. Human Dimensions of Wildlife, 20(6), 514–530.
751 https://doi.org/10.1080/10871209.2015.1083062
752 Mulholland, P. J., Best, G. R., Coutant, C. C., Hornberger, G. M., Meyer, J. L., Robinson, P. J.,
753 Stenberg, J. R., Turner, R. E., Vera-Herrera, F., & Wetzel, R. G. (1997). Effects of climate
754 change on freshwater ecosystems of the south-eastern United States and the Gulf Coast of
755 Mexico. In Hydrological Processes (Vol. 11, Issue 8, p. 22).
756 Onyishi, I. E., Nwonyi, S. K., Pazda, A., & Prokop, P. (2021). Attitudes and behaviour toward
757 snakes on the part of Igbo people in southeastern Nigeria. Science of The Total Environment,
758 763, 143045. https://doi.org/10.1016/j.scitotenv.2020.143045
759 Pinheiro, L. T., Rodrigues, J. F. M., & Borges-Nojosa, D. M. (2016). Formal education, previous
760 interaction and perception influence the attitudes of people toward the conservation of snakes
761 in a large urban center of northeastern Brazil. Journal of Ethnobiology and Ethnomedicine,
762 12(1), 25. https://doi.org/10.1186/s13002-016-0096-9
763 Purdy, K. G., & Decker, D. J. (1989). Applying wildlife values information in management: The
764 wildlife attitudes and values scale. Wildlife Society Bulletin (1973-2006), 17(4), 494–500.
765 R Core Team. (2021). R: A language and environment for statistical computing. R Foundation for
766 Statistical Computing. https://www.r-project.org/

Rabalais, N. N., Turner, R. E., Gupta, B. K. S., Platon, E., & Parsons, M. L. (2007). Sediments tell the history of eutrophication and hypoxia in the northern Gulf of Mexico. Ecological Applications, 17(sp5), S129–S143. https://doi.org/10.1890/06-0644.1

Scavia, D., Field, J. C., Boesch, D. F., Buddemeier, R. W., Burkett, V., Cayan, D. R., Fogarty, M., Harwell, M. A., Howarth, R. W., Mason, C., Reed, D. J., Royer, T. C., Sallenger, A. H., & Titus, J. G. (2002). Climate change impacts on U.S. coastal and marine ecosystems. Estuaries, 25(2), 149–164. https://doi.org/10.1007/BF02691304

Schuster, R., Germain, R. R., Bennett, J. R., Reo, N. J., & Arcese, P. (2019). Vertebrate biodiversity on indigenous-managed lands in Australia, Brazil, and Canada equals that in protected areas. Environmental Science & Policy, 101, 1–6. https://doi.org/10.1016/j.envsci.2019.07.002

Serenari, C., & Taub, M. (2019). Predicting the legitimacy of wolf recovery. Wildlife Biology, 2019(1), 1–12. https://doi.org/10.2981/wlb.00454

Singer, E., Van Hoewyk J, & Maher, M. P. (2000). Experiments with incentives in telephone surveys. Public Opinion Quarterly, 64(2), 171–188. https://doi.org/10.1086/317761

Sutherland, W. J., Dicks, L. V., Everard, M., & Geneletti, D. (2018). Qualitative methods for ecologists and conservation scientists. Methods in Ecology and Evolution, 9(1), 7–9. https://doi.org/10.1111/2041-210X.12956

Tableau. Technical specifications. Seattle, WA: Tableau Software. <https://www.tableau.com/products/techspecs>

Teel, T. L., & Manfredo, M. J. (2010). Understanding the diversity of public interests in wildlife conservation. Conservation Biology, 24(1), 128–139.

Treves, A., Wallace, R. B., & White, S. (2009). Participatory planning of interventions to mitigate

human–wildlife conflicts. Conservation Biology, 23(6), 1577–1587. https://doi.org/10.1111/j.1523-1739.2009.01242.x

United States. (1983). The Endangered Species Act as amended by Public Law 97-304 (the Endangered Species Act amendments of 1982). Washington : U.S. G.P.O., 1983. https://search.library.wisc.edu/catalog/999606103702121

U.S. Census Bureau. (2020). Alabama. https://data.census.gov/cedsci/profile?g=0400000US01

Venables, W. N. & Ripley, B. D. (2002) Modern Applied Statistics with S. Fourth Edition. Springer, New York. ISBN 0-387-95457-0

Whyte, K. (2018). Settler colonialism, ecology, and environmental injustice. Environment and Society, 9, 125–144. https://doi.org/10.3167/ares.2018.090109

Wildlife management areas. (2021). Outdoor Alabama. https://www.outdooralabama.com/hunting/wildlife-management-areas

Willson, J. D., & Winne, C. T. (2016). Evaluating the functional importance of secretive species: A case study of aquatic snake predators in isolated wetlands. Journal of Zoology, 298(4), 266–273. https://doi.org/10.1111/jzo.12311

806 **Table 1**. Comparison of attitude towards wildlife (Q11.1-11.28) between hunters and non-hunters
807 (Q8.1). Chi-square, degrees of freedom (df), and p-values obtained with the Chi-square test and
808 Fisher's exact test are reported. Statistics are reported for the entire data for the Chi-square and the
809 reduced model (removing columns and rows with less than 5 entries) for the Fisher's exact test, as
810 this latter performs better than the former on a reduced model. For contingency tables with Fisher's
811 exact test, only p-value is reported.

Animal	Chi-square	df	p-value Chi-square	p-value Fisher test
Armadillo	56.022	9	< 0.0001	0.0001
Rabbit	145.1	9	< 0.0001	0.0001
Fox	60.9	9	< 0.0001	0.0001
Bear	61.806	9	< 0.0001	0.0001
Raccoon	73.095	9	< 0.0001	0.0001
Squirrel	166	9	< 0.0001	0.0001
Opossum	95.402	9	< 0.0001	0.0001
Deer	621.24	9	< 0.0001	0.0001
Coyote	234.39	9	< 0.0001	0.0001
Beaver	68.659	9	< 0.0001	0.0001
Bat	24.653	9	< 0.0001	0.003
Cougar	75.191	9	< 0.0001	0.0001
Hog/Boar	428.75	9	< 0.0001	0.0001
Crow/Pigeon/Dove	157.31	9	< 0.0001	0.0001
Owl	20.046	9	0.018	0.007
Vulture	27.614	9	0.001	0.0001
Heron/Egret	31.195	9	0.0003	0.0002
Duck/Geese	208.15	9	< 0.0001	0.0001
Bird of Prey	22.316	9	0.008	0.008
Turkey	374.95	9	< 0.0001	0.0001

Seagull	23.741	9	0.005	0.003
Lizard	27.157	9	0.001	0.003
Turtle	20.541	9	0.015	0.018
Snake	72.203	9	< 0.0001	0.0001
Alligator	80.924	9	< 0.0001	0.0001
Frog	44.093	9	< 0.0001	0.0001
Salamander	11.877	9	0.220	0.190

812

Table 2. Comparison of attitude towards wildlife (Q11.1-11.28) as a function of demographic information. Chi-square (X), degrees of freedom (df), and p-values obtained with the Chi-square test and Fisher's exact test are reported. Statistics are reported for the entire data for the Chi-square and the reduced model (removing columns and rows with less than 5 entries) for the Fisher's exact test, as this latter performs better than the former on a reduced model. For contingency tables with Fisher's exact test, only p-value is reported. Underlined are NON significant p-values

	Gender				Age				Education				Income			
Animal	X	df	p X	p Fisher	X	df	p X	p Fisher	X	df	p X	p Fisher	X	df	p X	p Fisher
Armadillo	31.58	9	0.0002	0.0001	500.12	72	< 0.0001	0.0126	177.83	63	< 0.0001	0.001	58.53	54	0.313	0.147
Rabbit	42.44	9	< 0.0001	0.0001	171.21	72	< 0.0001	0.0001	178.41	63	< 0.0001	0.0001	80.73	54	0.011	0.004
Fox	47.80	9	< 0.0001	0.0001	271.26	72	< 0.0001	0.0001	160.52	63	< 0.0001	0.0001	102.41	54	0.0001	0.0001
Bear	71.15	9	< 0.0001	0.0001	205.45	72	< 0.0001	0.0001	157.15	63	< 0.0001	0.0001	96.04	54	0.0004	0.0001
Raccoon	26.7	9	0.0015	0.0008	259.70	72	< 0.0001	0.0001	119.48	63	< 0.0001	0.0001	81.74	54	0.009	0.004
Squirrel	38.29	9	< 0.0001	0.0001	152.66	72	< 0.0001	0.0001	112.22	63	0.0001	0.0001	73.01	54	0.04	0.013
Opossum	33.04	9	0.0001	0.0001	165.00	72	< 0.0001	0.0001	103.62	63	0.001	0.0013	71.98	54	0.05	0.02
Deer	45.46	9	< 0.0001	0.0001	134.40	72	< 0.0001	0.0001	112.23	63	0.0001	0.0001	102.19	54	0.0001	0.0005
Coyote	77.60	9	< 0.0001	0.0001	256.25	72	< 0.0001	0.0001	154.84	63	< 0.0001	0.0001	131.90	54	< 0.0001	0.0001
Beaver	36.46	9	< 0.0001	0.0001	180.05	72	< 0.0001	0.0001	156.08	63	< 0.0001	0.0001	87.73	54	0.0025	0.0005
Bat	42.32	9	< 0.0001	0.0001	186.53	72	< 0.0001	0.0001	137.80	63	< 0.0001	0.0001	86.84	54	0.0031	0.0005
Cougar	48.30	9	< 0.0001	0.0001	183.72	72	< 0.0001	0.0001	141.76	63	< 0.0001	0.0001	90.44	54	0.0014	0.0005
Hog/Boar	105.70	9	< 0.0001	0.0001	171.92	72	< 0.0001	0.0001	135.20	63	< 0.0001	0.0001	118.03	54	< 0.0001	0.0001
Crow/Pigeon/Dove	42.62	9	< 0.0001	0.0001	169.84	72	< 0.0001	0.0001	186.35	63	< 0.0001	0.0005	67.48	54	0.103	0.02

Owl	12.41	9	0.191	0.179	193.00	72	< 0.0001	0.0001	295.80	63	< 0.0001	0.0003	75.61	54	0.03	0.0019
Vulture	32.69	9	0.0002	0.0001	265.41	72	< 0.0001	0.0001	172.02	63	< 0.0001	0.0001	117.83	54	< 0.0001	0.0001
Heron/Egret	20.56	9	0.01	0.004	230.05	72	< 0.0001	0.0001	189.47	63	< 0.0001	0.0001	102.98	54	< 0.0001	0.0001
Duck/Geese	34.10	9	0.0001	0.0002	195.44	72	< 0.0001	0.0001	195.11	63	< 0.0001	0.0001	115.59	54	< 0.0001	0.0001
Bird of Prey	21.50	9	0.01	0.007	236.07	72	< 0.0001	0.0001	215.84	63	< 0.0001	0.0001	97.28	54	0.0003	0.0002
Turkey	39.41	9	< 0.0001	0.0002	196.93	72	< 0.0001	0.0001	168.77	63	< 0.0001	0.0001	81.11	54	0.01	0.007
Seagull	12.62	9	0.181	0.180	236.69	72	< 0.0001	0.0001	151.20	63	< 0.0001	0.0001	79.48	54	0.01	0.001
Lizard	31.33	9	0.0003	0.0002	232.56	72	< 0.0001	0.0001	128.31	63	< 0.0001	0.0001	76.98	54	0.02	0.01
Turtle	19.07	9	0.02	0.02	196.98	72	< 0.0001	0.0001	131.4	63	< 0.0001	0.0001	73.71	54	0.04	0.02
Snake	68.39	9	< 0.0001	0.0001	234.55	72	< 0.0001	0.0001	148.15	63	< 0.0001	0.0001	87.32	54	0.003	0.0001
Alligator	86.97	9	< 0.0001	0.0001	192.08	72	< 0.0001	0.0001	131.77	63	< 0.0001	0.0001	126.46	54	< 0.0001	0.0001
Frog	27.28	9	0.001	0.0002	205.28	72	< 0.0001	0.0001	146.32	63	< 0.0001	0.0001	72.06	54	0.05	0.04
Salamander	30.89	9	0.0003	0.0001	173.13	72	< 0.0001	0.0001	130.93	63	< 0.0001	0.0001	75.89	54	0.03	0.007

Figure 1. Study Area Map. The study was carried out in Mobile and Baldwin counties. These are the two southernmost counties in Alabama that border the Gulf of Mexico.

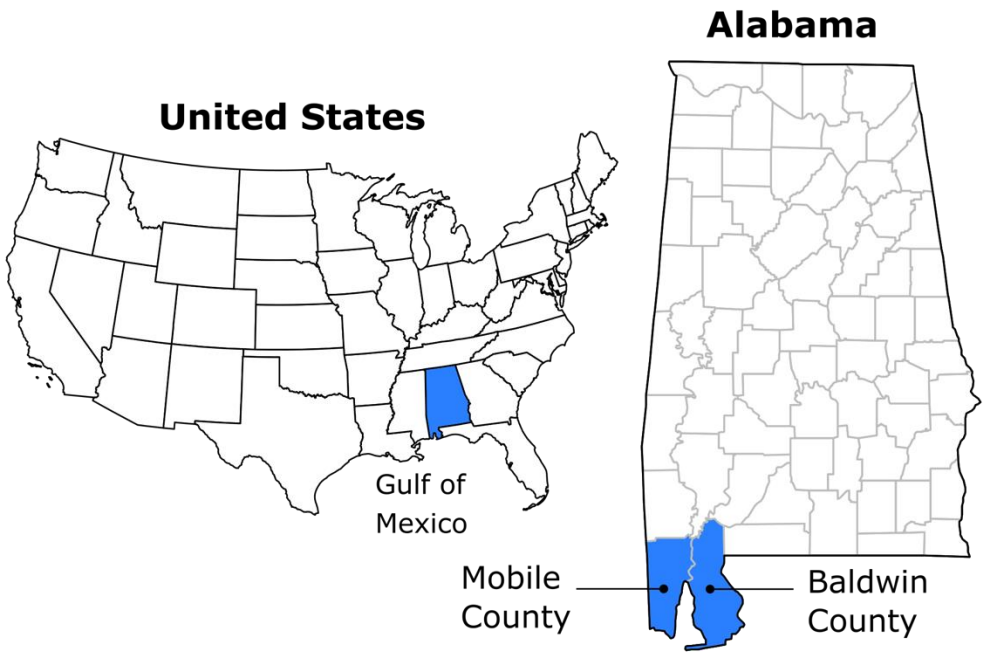
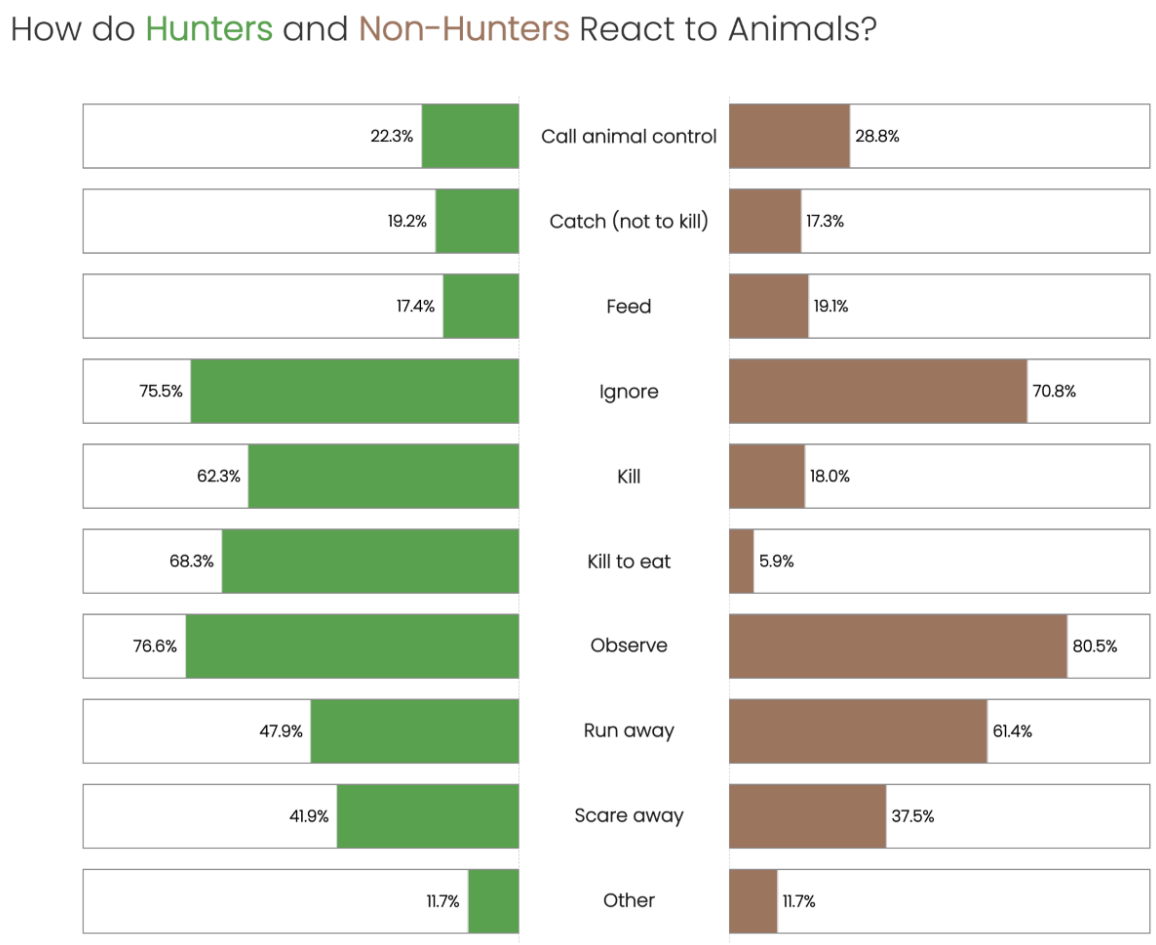


Figure 2. Summary of responses to encountering terrestrial vertebrates based on hunting status. Percentages are calculated as the percentage of hunters (or non-hunters) that independently of the encountered animal responded the represented option (e.g., "call animal control") at least once out of the total number of participants answering that question. Percentages are based on 265 hunters and 1000 non-hunters.



Supplementary Materials

Results

Data and demographic information

We obtained a total of 1355 survey entries. After removing 48 repeated surveys (individuals who took the survey twice), there were a total of 1307 participants in the cleaned dataset. We found no cases in which people stopped taking the survey half way through and only two cases out of 1307 entries in which people selected the same option for each question (always the first option for each question) throughout the survey. Finally, in six cases, individuals wrote nonsense as an answer to some of the questions. Since eight entries out of 1307 correspond to only 0.6% of cases, we left those entries in the final dataset and used 1307 entries for the analyses.

Individuals taking the survey lived, studied, and/or worked in Mobile and Baldwin counties and spanned different zip codes across southern Alabama. Out of 1307 entries, we were missing zip code or school information for only 68 people or 5% of the sample. Some zip code entries in the survey may be outside of Mobile and Baldwin counties because students may attend school in these counties, but live in another area.

Pet ownership and hobbies and knowledge and value of the area

Having pets (Q10.1-10.3) influenced the number and types of animals that people observe during a typical week (Q7.1), with non-pet owners observing significantly less animals than people with pets ($p = 0.03$). Pet ownership did not influence the knowledge of the area's biodiversity (Q11.29, $p = 0.17$) nor whether or not individuals favored increasing the amount of protected areas (Q11.30, $p = 0.2$). However, pet owners would be willing to spend more on protection (Q11.31, $p = 0.001$) than non-pet owners. Seventy-nine percent of non-pet owners responded that they would spend less than $20 per year on protection compared to 66% of pet-owners.

As expected, individuals who engage in outdoor recreation (Q9.1) see significantly more animals (Q7.1) than those who do not do outdoor activities ($p= 0.0001$), with 48% of "outdoorsy" people seeing more than 16 animals on average per week compared to 31% of their "non-outdoorsy" counterparts. People

who do outdoor activities overall differ in their knowledge about the area (p=0.0002) as 48% and 32% of "outdoorsy" and "non-outdoorsy" individuals, respectively, answered that their region has a similar number of different wild animals to the rest of the US when in fact it is among the most biodiverse in the nation. Conversely, 48% of "non-outdoorsy" individuals claimed that they did not know the answer to this question (Q11.29) compared to only 33% of "outdoorsy" individuals. "Outdoorsy" individuals overall are significantly more interested in increasing protected areas (55%) than their "non-outdoorsy" counterparts (48%) (Q11.30, p = 0.007) and are also more interested in investing money to protect those areas (55%).

Class Climate	Citizen Survey: Evaluate Citizen Knowledge and Attitude Towards Wild Animals	SCANTRON.

Mark as shown: ☐ ☒ ☐ ☐ ☐ Please use a ball-point pen or a thin felt tip. This form will be processed automatically.

Correction: ☐ ■ ☐ ☒ ☐ Please follow the examples shown on the left hand side to help optimize the reading results.

1. This survey is part of a larger research project including undergraduate students at the University of South Alabama (Mobile, AL). We are conducting research to determine which areas in the Mobile/Baldwin counties are experiencing large environmental changes and how this affects wild animals. This survey aims to assess which wild animals are observed in different environments in Mobile/Baldwin counties and how people feel about encountering them. This should only take about ten minutes of your time.

To complete this survey electronically, type in the web address listed below:

http://ccwebsrv.usouthal.edu/classclimate/online.php?p=RUNVK

Citizen survey led by Dr. Ylenia Chiari— University of South Alabama, Mobile, AL
Contact information— Email: yleniachiari@southalabama.edu/Phone: 251 460-6331

1.1 Have you already taken this survey? ☐ Yes ☐ No

2. Which of the following wild animals (not including animals kept as pets or in cages) do you see dead or alive in your daily life on a regular basis (so it must be observed often) near home, on your way to school or work, etc.? Note that the images shown are just examples of the organisms indicated and that any animal of that category should still be considered. Please check yes for all of the animals that apply, and no to the ones that don't. Mammals:

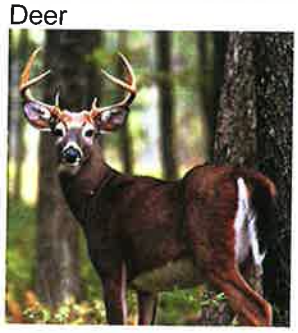
2.1 Squirrel

☐ Yes
☐ No

2.2 Opossum

☐ Yes
☐ No

2.3 Deer



☐ Yes
☐ No

2. Which of the following wild animals (not including animals kept as pets or in cages) do you see dead or alive in your daily life on a regular basis (so it must be observed often) near home, on your way to school or work, etc.? Note that the images shown are just examples of the organisms indicated and that any animal of that category should still be considered. Please check yes for all of the animals that apply, and no to the ones that don't. Mammals: [Continue]

2.4 Coyote

☐ Yes
☐ No

2.5 Beaver

☐ Yes
☐ No

2.6 Bat

☐ Yes
☐ No

2.7 Cougar/Mountain Lion

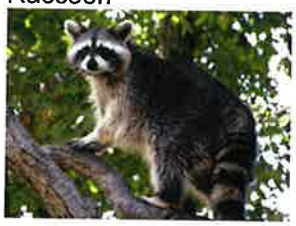
☐ Yes
☐ No

2.8 Hog/Boar

☐ Yes
☐ No

2. Which of the following wild animals (not including animals kept as pets or in cages) do you see dead or alive in your daily life on a regular basis (so it must be observed often) near home, on your way to school or work, etc.? Note that the images shown are just examples of the organisms indicated and that any animal of that category should still be considered. Please check yes for all of the animals that apply, and no to the ones that don't. Mammals: [Continue]

2.9 Raccoon



☐ Yes
☐ No

2.10 Fox

☐ Yes
☐ No

2.11 Bear

☐ Yes
☐ No

2.12 Rabbit

☐ Yes
☐ No

2. Which of the following wild animals (not including animals kept as pets or in cages) do you see dead or alive in your daily life on a regular basis (so it must be observed often) near home, on your way to school or work, etc.? Note that the images shown are just examples of the organisms indicated and that any animal of that category should still be considered. Please check yes for all of the animals that apply, and no to the ones that don't. Mammals: [Continue]

2.13 Armadillo

☐ Yes
☐ No

3. Which of the following wild animals (not including animals kept as pets or in cages) do you see dead or alive in your daily life on a regular basis (so it must be observed often) near home, on your way to school or work, etc.? Note that the images shown are just examples of the organisms indicated and that any animal of that category should still be considered. Please check yes for all of the animals that apply, and no to the ones that don't. Birds:

3.1 Vulture/Owl/Bird of Prey

☐ Yes
☐ No

3.2 Small Birds

☐ Yes
☐ No

3.3 Egrets/Herons

☐ Yes
☐ No

3.4 Seagulls

☐ Yes
☐ No

3. Which of the following wild animals (not including animals kept as pets or in cages) do you see dead or alive in your daily life on a regular basis (so it must be observed often) near home, on your way to school or work, etc.? Note that the images shown are just examples of the organisms indicated and that any animal of that category should still be considered. Please check yes for all of the animals that apply, and no to the ones that don't. Birds: [Continue]

3.5 Duck/Geese/Swan

☐ Yes
☐ No

3.6 Wild Turkey

☐ Yes
☐ No

3.7 Crow/Pigeon/Dove

☐ Yes
☐ No

4. Which of the following wild animals (not including animals kept as pets or in cages) do you see dead or alive in your daily life on a regular basis (so it must be observed often) near home, on your way to school or work, etc.? Note that the images shown are just examples of the organisms indicated and that any animal of that category should still be considered. Please check yes for all of the animals that apply, and no to the ones that don't. Reptiles:

4.1 Lizard

☐ Yes
☐ No

4. Which of the following wild animals (not including animals kept as pets or in cages) do you see dead or alive in your daily life on a regular basis (so it must be observed often) near home, on your way to school or work, etc.? Note that the images shown are just examples of the organisms indicated and that any animal of that category should still be considered. Please check yes for all of the animals that apply, and no to the ones that don't. Reptiles: [Continue]

4.2 Snake

☐ Yes
☐ No

4.3 Turtle

☐ Yes
☐ No

4.4 Alligator

☐ Yes
☐ No

5. Which of the following wild animals (not including animals kept as pets or in cages) do you see dead or alive in your daily life on a regular basis (so it must be observed often) near home, on your way to school or work, etc.? Note that the images shown are just examples of the organisms indicated and that any animal of that category should still be considered. Please check yes for all of the animals that apply, and no to the ones that don't. Amphibians:

5.1 Frog

☐ Yes
☐ No

5. Which of the following wild animals (not including animals kept as pets or in cages) do you see dead or alive in your daily life on a regular basis (so it must be observed often) near home, on your way to school or work, etc.? Note that the images shown are just examples of the organisms indicated and that any animal of that category should still be considered. Please check yes for all of the animals that apply, and no to the ones that don't. Amphibians: [Continue]

5.2 Salamander

☐ Yes
☐ No

6. Are there other wild animals that you see on regular basis that are not shown in the pictures above? If so, which one(s)?

6.1 Please list them here.

7. How many total individuals of all the different wild animals shown in the pictures above do you approximately see on average in a week? (*e.g.*, 10 frogs, 10 seagulls and 2 bats = 22)

7.1

☐ 0-5 ☐ 6-10 ☐ 11-15
☐ 16-20 ☐ 21-30 ☐ 31+

8. The following questions regard hunting. If you do not hunt, and they do not apply to you, please select N/A when applicable.

8.1 Do you hunt wild animals? ☐ Yes ☐ No

8.2 If yes, which animal(s) do you hunt?

☐ Deer ☐ Squirrel ☐ Turkey
☐ Boar/Hog ☐ Frog ☐ Rabbit
☐ Ducks ☐ Quails ☐ Alligator
☐ Turtle ☐ Bears ☐ Squirrels
☐ Doves ☐ Pheasant ☐ Grouse
☐ N/A ☐ Other

8.3 If you selected "*other*" for the previous question, please list the wild animal(s) you hunt in the box provided.

8.4 If you hunt, select all of the following that apply to you.

☐ Trap ☐ Gun ☐ Bow
☐ Other ☐ N/A

8.5 If you selected *"other"* for the previous question, please explain below.

9. Outdoor Activities

9. Outdoor Activities [Continue]

9.1 Do you spend time doing outdoor activities? If not, you may select "N/A" for the following question. ☐ Yes ☐ No

9.2 If you do spend time doing outdoor activities, check all of the boxes that apply you.

☐ Hiking (trails) ☐ Running/walking in local park/ neighborhood ☐ Hunting
☐ Riding horses ☐ Camping ☐ Fishing
☐ Gardening ☐ Climbing ☐ Other
☐ N/A

9.3 If you selected other, please expand on what other activities you commonly do below.

10. Pets

10.1 Do you have any pets? ☐ Yes ☐ No

10.2 If yes, what pet(s) do you have? Check all boxes that apply.

☐ Dog ☐ Cat ☐ Snake
☐ Rabbit ☐ Gerbil/Hamster ☐ Fish
☐ Bird ☐ Frog ☐ Other
☐ N/A

10.3 If you selected other, tell us what other pet you have in the box.

11. What is your most likely reaction when you see each of the animal listed below alive?

	Kill	Kill to eat	Ignore	Call Animal Control	Feed	Scare away	Observe	Run away	Catch (not to kill)	Other
11.1 Armadillo	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
11.2 Rabbit	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
11.3 Fox	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
11.4 Bear	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
11.5 Raccoon	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
11.6 Squirrel	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
11.7 Opossum	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
11.8 Deer	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
11.9 Coyote	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
11.10 Beaver	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
11.11 Bat	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
11.12 Cougar	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
11.13 Hog/Boar	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
11.14 Crow/Pigeon/Dove	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
11.15 Owl	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
11.16 Vulture	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
11.17 Heron/egret	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
11.18 Duck/Geese	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

11. What is your most likely reaction when you see each of the animal listed below alive? [Continue]

	Kill to eat	Kill	Call Animal Control	Ignore	Feed	Scare away	Observe	Run away	Catch (not to kill)	Other
11.19 Bird of Prey	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
11.20 Turkey	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
11.21 Seagull	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
11.22 Lizard	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
11.23 Turtle	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
11.24 Snake	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
11.25 Alligator	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
11.26 Frog	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
11.27 Salamander	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

11.28 If you selected "other" for any of the previous questions, please explain in the box provided.

11.29 Do you think that the Mobile/Baldwin counties have a similar number of different wild animals than other places in the USA?
☐ Yes ☐ No ☐ I don't know

11.30 Do you feel that the Mobile/Baldwin counties should increase, decrease, or keep the same amount of area as currently dedicated to the protection of these wild animals?
☐ Increase protected area ☐ Decrease protected area ☐ Keep the same amount of protected area ☐ I don't know

11.31 How much would you be willing to pay per year to maintain or increase the protected area?
☐ Nothing ☐ $5-$10 ☐ $11-$20 ☐ $21-$30 ☐ $31-$50 ☐ $51-$100 ☐ $100+

12. Demographics

12.1 What is your gender?
☐ Male ☐ Female

12.2 In what age range do you fall?
☐ 5-12 ☐ 13-19 ☐ 20-30 ☐ 31-40 ☐ 41-50 ☐ 51-60 ☐ 61-70 ☐ 71-80 ☐ 81+

12.3 (Minors only). What school do you go to?

12.4 (Adults only). Postal zip code where you live:

12. Demographics [Continue]

12.5 Please check only the box that states your highest level of education. (5 years and older)

- ☐ Elementary School (Grades K-5)
- ☐ Middle or Junior High School (Grades 6-8)
- ☐ High School (9-12)
- ☐ Community College
- ☐ 4-year College/ University
- ☐ Professional School
- ☐ Graduate School (Masters)
- ☐ Graduate School (PhD)

12.6 (Adults only). What is your gross annual household income before tax?

- ☐ Below $30,000
- ☐ $30,000 - $49,999
- ☐ $50,000 - $69,999
- ☐ $70,000 - $89,999
- ☐ $90,000 and above
- ☐ I don't know
- ☐ Prefer not to answer