

RISK PERCEPTIONS OF AND ACCEPTANCE CAPACITY FOR  
THE AMERICAN CROCODILE (*Crocodylus acutus*) IN  
SOUTH FLORIDA

By

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## TABLE OF CONTENTS

	<u>page</u>
ACKNOWLEDGMENTS .....	iii
LIST OF TABLES .....	vi
LIST OF FIGURES .....	vii
INTRODUCTION .....	1
Stakeholder Considerations .....	2
Conceptual Framework.....	5
Study Purpose .....	7
METHODS .....	9
Questionnaire Development .....	9
Questionnaire Content .....	10
Questionnaire Administration.....	14
Statistical Procedures.....	16
RESULTS .....	19
Survey Response.....	19
Involvement with Wildlife and American Crocodiles.....	19
Crocodile Knowledge .....	25
Information Avenues .....	26
Attitudes Towards American Crocodiles.....	27
Acceptance of Management Tools .....	31
Perceptions of Recent American Crocodile Population Trends .....	32
Risk Beliefs about American Crocodiles.....	34
Subjective Risk Perceptions of American Crocodiles.....	37
Factors Affecting Risk Beliefs about American Crocodiles.....	38
Preferences for Future American Crocodile Population Trends.....	38
Factors Affecting Preferences for American Crocodile Populations .....	41
DISCUSSION .....	43

APPENDIX

A THE INFORMED CONSENT PROCESS USED FOR INDIVIDUALS  
PARTICIPATING IN THE PRELIMINARY INTERVIEWS .....48

B THE INFORMED CONSENT PROCESS USED FOR INDIVIDUALS  
COMPLETING THE QUESTIONNAIRE .....49

C THE SELF-ADMINISTERED QUESTIONNAIRE USED FOR INQUIRY INTO  
THE BELIEFS, ATTITUDES, RISK PERCEPTIONS, AND CROCODILE  
POPULATION PREFERENCES OF STAKEHOLDERS IN SOUTH FLORIDA ..50

LIST OF REFERENCES .....63

BIOGRAPHICAL SKETCH .....68

## LIST OF TABLES

<u>Table</u>		<u>page</u>
1	Principal component analysis for response of questionnaire participants to semantic differential items related to risks from American crocodiles in south Florida. ....	13
2	Principal component analysis for response of questionnaire participants to belief statements regarding American crocodiles in south Florida. ....	14
3	Percent of questionnaire respondents who are permanent Florida residents, seasonal Florida residents, and visitors to Florida that indicated they participate in various outdoor and wildlife-related activities. ....	20
4	Percent of questionnaire respondents who are permanent Florida residents, seasonal Florida residents, and visitors to Florida that indicated they had various involvement with American crocodiles in south Florida. ....	22
5	Pearson correlation coefficients for the six main questionnaire variables. ....	24
6	Pearson correlation coefficients between the six main questionnaire variables and age, education, income, and community involvement. ....	25
7	Percent of questionnaire respondents that indicated they heard or saw various amounts of information about the American crocodile and American alligator from different sources. ....	28
8	Response of questionnaire participants to belief statements regarding American crocodiles in south Florida. ....	30
9	Response of questionnaire participants to semantic differential items related to risks from American crocodiles in south Florida. ....	36
10	Response of questionnaire participants to the likelihood of experiencing various risks versus being attacked by an American crocodile. ....	37
11	Regression model for prediction of risk perceptions of American crocodiles. ....	39
12	Logistic regression model for prediction of desired future American crocodile population trends. ....	42

## LIST OF FIGURES

<u>Figure</u>		<u>page</u>
1	Percent of questionnaire respondents who are permanent Florida residents, seasonal Florida residents, and visitors to Florida with various levels of involvement with American crocodiles.....	23
2	Percent of questionnaire respondents that indicated relocation to be an acceptable or unacceptable management tool for American crocodiles involved in various scenarios. ....	32
3	Percent of questionnaire respondents that indicated euthanasia to be an acceptable or unacceptable management tool for American crocodiles involved in various scenarios. ....	33
4	Percent of questionnaire respondents who are permanent Florida residents, seasonal Florida residents, and visitors to Florida that believed the American crocodile population in south Florida either increased, decreased, or remained the same during 1998-2003. ....	34
5	Path diagram for risk perceptions of American crocodiles (RBELIEF), with path coefficients added.....	39
6	Percent of questionnaire respondents who are permanent Florida residents, seasonal Florida residents, and visitors to Florida that revealed preferences for a smaller, larger, or similar American crocodile population in south Florida for 2004-2009.....	40

Abstract of Thesis Presented to the Graduate School  
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RISK PERCEPTIONS OF AND ACCEPTANCE CAPACITY FOR  
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SOUTH FLORIDA

By

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The Florida population of the American crocodile (*Crocodylus acutus*) has been increasing in numbers since 1975. Human-crocodile interactions are also rising, which presents new challenges to wildlife managers and biologists working to recover this endangered species. This study investigated factors affecting stakeholders' risk perceptions of and acceptance capacity for the American crocodile in south Florida to enhance conservation and recovery efforts for this species. Results from this study could also formulate strategy for an educational program to increase understanding of and acceptance for crocodiles and encourage positive, proactive attitudes about crocodile conservation.

A self-administered questionnaire (n = 249) was used to measure stakeholder involvement with American crocodiles, knowledge of American crocodiles, risk beliefs associated with crocodiles, attitudes towards crocodiles, perceptions of current population

trends, and preferences for future population trends. Attitudes toward crocodiles formed the most parsimonious model to predict risk perceptions of crocodiles in a model that explained 23.0% of the variance. People who expressed negative attitudes towards crocodiles had the greatest probability of considering crocodiles a high risk to humans. Knowledge of crocodiles is not a significant predictor of risk perceptions, but may have an indirect effect on risk perceptions of crocodiles through attitudes towards crocodiles. A 2-variable model including risk perceptions of crocodiles and attitudes toward crocodiles correctly predicted respondents' desired future crocodile population trends 94.0% of the time. Respondents who believed crocodiles presented a low risk to humans and expressed positive attitudes towards crocodiles had the greatest probability of preferring a stable or increased future crocodile population. Demographic variables such as age, gender, level of formal education, income level, children in household, and community involvement did not significantly affect risk perceptions of or acceptance capacity for American crocodiles.

This study suggests developing educational programs that teach appropriate behavior in the presence of crocodiles, address risks and benefits of crocodiles, increase knowledge of crocodiles, and reveal that south Florida residents, visitors, and experts perceive low risks from crocodiles. Programs that incorporate the above recommendations will be most effective for decreasing risk perceptions of and increasing positive attitudes towards and acceptance capacity for crocodiles.

## INTRODUCTION

The Florida population of the American crocodile (*Crocodylus acutus*) was federally listed as endangered in 1975 (Federal Register 40: 44149) and has been increasing in numbers ever since (Mazzotti and Cherkiss 2003). The human population of south Florida has also been increasing during this time (United States Census Bureau 2003), and as crocodiles reoccupy parts of their historic range now inhabited by people, increased human-crocodile interactions are occurring. These interactions have led to an increase in crocodile-related complaints (T. Regan, Florida Fish and Wildlife Conservation Commission, personal communication 2002) and present new challenges to wildlife managers and biologists working to recover this endangered species.

Managing endangered species can be difficult because of both real and perceived restrictions under the Endangered Species Act. Negative attitudes often result if the presence of an endangered species is believed to restrict private property rights (Drake and Jones 2002) or limit access to and use of natural resources (Reading and Kellert 1993). If anti-conservation attitudes prevail, measures to protect or enhance the species could become difficult. Socioeconomic considerations address these concerns and are crucial for effective recovery programs, yet are often ignored or insufficiently considered in endangered species management efforts (Kellert 1985a, Reading and Kellert 1993). This study seeks to understand public perceptions of and preferences for the American crocodile to enhance conservation and recovery efforts for this species.

## **Stakeholder Considerations**

Wildlife management during most of the twentieth century was executed solely by wildlife biologists. Although management decisions typically used input from selected stakeholders (e.g., hunters, farmers, landowners), managers rarely sought participation from them or other members of the public in actual decision-making (Decker and Chase 1997). Towards the end of the twentieth century, the array of stakeholders in wildlife management diversified and their expectations for involvement in decisions increased (Riley et al. 2002). The use of biological knowledge for wildlife management will always be essential, but it may no longer be sufficient to use expert authority as the exclusive basis for practicing wildlife management. Many wildlife managers are increasingly integrating biological knowledge with information on human dimensions in management processes (Riley et al. 2002) as stakeholders become a central component of contemporary wildlife management (Decker et al. 1996).

Decker and Purdy (1988) introduced the concept of wildlife acceptance capacity (WAC) to explain how human beliefs and preferences affect decisions on the management of wildlife population levels. Wildlife acceptance capacity is an estimate of the maximum wildlife population level that is acceptable to people in a given area. Unlike biological carrying capacity, which theoretically has one value for a specific wildlife population in a defined area at a defined moment in time, there can be many WAC levels for a particular wildlife population at a given point in time. This is due to different key constituency groups simultaneously possessing different acceptance levels.

Carpenter et al. (2000) expanded the concept of wildlife acceptance capacity to describe wildlife stakeholder acceptance capacity (WSAC). WSAC can describe people's unwillingness to accept scarcity or extinction of important or popular species, as

well as people's unwillingness to accept overabundance or increases of nuisance or unpopular species. Determinants of WSAC are thought to include perceived positive and negative impacts of the species, characteristics of the species (e.g., aesthetic appeal, phylogenetic relatedness of the species to humans, economic value of the species), situational specifics (e.g., management actions, proximity of human populations and activities to animal populations), past experiences, beliefs and attitudes about the species, risk tolerance of stakeholders, and perceptions of population trends (Craven et al. 1992, Carpenter et al. 2000, Zinn et al. 2000). Understanding factors affecting acceptance capacity for the crocodile will help wildlife managers select standards for population levels and management actions that meet public approval, which may help avoid or reduce conflict over management decisions (Zinn et al. 2000).

Risk perceptions of potentially dangerous wildlife are of great interest since such perceptions often influence management policy (Riley and Decker 2000a). Far less dread, fear, or worry is typically associated with risks accepted voluntarily, particularly those from familiar events, than risks that are new or for which persons do not have a sense of control (Slovic 1987). An encounter, or even the potential for an encounter, with an American crocodile could represent the type of low probability-high consequence event that leads to dread and elevated risk perceptions (Slovic 1987), which could subsequently lower WSAC for this species (Riley and Decker 2000a). Identifying factors that affect risk perceptions of crocodiles could help wildlife agencies design tailored educational programs to increase understanding of and acceptance for crocodiles among different stakeholder groups.

Managers' judgments about public perceptions of wildlife are not always accurate (Miller and McGee 2001), and managing risks should be guided by facts, not "undisciplined speculation about the beliefs or motivations of other people" (Fischhoff 1995, p. 144). Managers need to recognize and understand differences between objective and subjective risk perceptions and between experts' and lay persons' perceptions of risk (McClelland et al. 1990, Fischhoff 1995). Experts and lay people may agree about the number of fatalities associated with an action or hazard (i.e., objective risk), but disagree about its degree of risk (i.e., subjective risk). Lay people often place greater weight on catastrophic potential and unfamiliar risks (Fischhoff 1995, Slovic 1987), resulting in discrepancies between perceived risks and fatality estimates (von Winterfeldt et al. 1981). Researching public risk perceptions of crocodiles can confirm or reject assumptions about stakeholders (Butler et al. 2001) and result in better, more-informed management decisions (Decker 1994).

Demographics can play a significant role in risk perceptions of large predators and beliefs and attitudes towards animals in general. Women (Kellert and Berry 1987, Miller and McGee 2000, Zinn and Pierce 2002), elderly individuals (Kellert 1985b, Kleiven et al. 2004), and people with limited education (Kellert et al. 1996, Riley and Decker 2000a) often exhibit greater risk perceptions of and more negative attitudes toward large predators. Zinn and Pierce (2002) found individuals with children under 18 years of age living in the home were more likely to fear attack by a mountain lion than those without young children at home, although Riley and Decker (2000b) discovered having children at home did not significantly affect acceptance capacity for the mountain lion. Understanding the influence of demographics on risk perceptions of and acceptance

capacity for the American crocodile will enable wildlife managers and policy makers to more effectively target their audiences and make better management decisions.

### **Conceptual Framework**

Since protecting endangered species such as the American crocodile often requires public participation and cooperation, an important question is: What factors affect public support for species conservation efforts, specifically acceptance capacity for potentially dangerous species? Kempton (1991) argues that citizens' comprehension of scientific and environmental issues is significant to the decision-making process since the public often bears costs of environmental protection. In other words, stakeholders must possess knowledge about the issue to make informed decisions. Bord et al. (2000) corroborate this notion by showing accurate knowledge precedes concern for global warming and is the strongest predictor of intentions to behave in ways that might lessen climate change (e.g., drive less, choose vehicle with good gas mileage). In reference to species preservation, Tisdell and Wilson (2004) found support for conservation of tree-kangaroos (*Dendrolagus* sp.) in Australia increased with greater knowledge of the species.

The connection between environmental knowledge and environmental concern is not always present, however. The National Environmental Education and Training Foundation (NEETF) rated the American public very high on attitudes toward environmental support, yet very low on level of environmental knowledge (NEETF 1999). Hunter and Rinner (2004) found that environmental perspectives, not environmental knowledge, are associated with support for local species preservation. Knowledge was suggested to supplement, not supplant, environmental perspectives for affecting interest in species preservation. Hunter and Rinner (2004) suggest incorporating importance of ecological integrity and biological diversity, not just

information specific to certain species, into outreach efforts to increase public support for species diversity.

Riley and Decker (2000b) discovered individuals who believed mountain lion populations had decreased, expressed positive attitudes toward mountain lions, and perceived low risk perceptions of mountain lions possessed higher acceptance capacities for the species. In addition, stakeholders with lower education levels had higher risk perceptions of mountain lions (Riley and Decker 2000a). Understanding the connection between stakeholders' knowledge of, perceptions of, and preferences for other potentially dangerous animals, such as the American crocodile, will help identify effective means for communicating about and conserving such species.

Several frameworks have been developed to measure the connection between attitudes and behaviors for environmental concern. The Environmental Concern Scale emerged as a "brief, easy-to-use research tool . . . capable of examining the correlates and determinants of attitudinal concern about environmental quality, longitudinal change in public attitudes, and the attitudinal impact of environmentally oriented policies, legislation, and educational efforts" (Weigel and Weigel 1978, p. 12). The New Environmental Paradigm (Dunlap and Van Liere 1978), now termed the New Ecological Paradigm to reflect a more sophisticated perspective toward human relationships to the natural world, has been used by researchers in a variety of arenas and cultural contexts (Dunlap et al. 2000). The New Ecological Paradigm scale is designed to assess values, attitudes, and beliefs toward ecological concepts such as balance of nature, limits to growth, and human domination of nature (Dunlap et al. 2000). Ideas from both the Environmental Concern Scale and New Ecological Paradigm can be used to test the link

between stakeholders' knowledge, attitudes, beliefs, and acceptance capacity for the American crocodile.

### **Study Purpose**

The goals for this study were to understand stakeholders' risk perceptions of and acceptance capacity for the American crocodile in south Florida. Previous studies examining acceptance levels for wildlife have generally focused on large mammalian species, such as deer (*Odocoileus virginianus*, Stout et al. 1997), mountain lions (*Puma concolor*, Riley and Decker 2000b), and black bears (*Ursus americanus*, Siemer and Decker 2003). Researching perceptions of and acceptance capacities for large reptilian species, such as crocodiles, will broaden the information base available to wildlife managers and decision makers and advance the body of human dimensions research for wildlife management in general. Of particular interest for this study was whether variables that best predict risk perceptions of and preferences for crocodile populations would be similar to those for mammalian species.

To achieve the goals for this study, the following research questions were investigated:

1. Does involvement with crocodiles, knowledge of crocodiles, attitudes towards crocodiles, perceptions of current crocodile population trends, or socioeconomic variables affect risk perceptions of crocodiles?
2. Does involvement with crocodiles, knowledge of crocodiles, risk perceptions of crocodiles, attitudes towards crocodiles, perceptions of current crocodile population trends, or socioeconomic variables affect preferences for future crocodile population trends?

Results from this study could also formulate strategy for an educational program aimed at south Florida residents and visitors who live and recreate near crocodile habitat. Public education can provide the foundation for developing positive, proactive attitudes

about crocodile conservation (United States Fish and Wildlife Service 1999). An informed, supportive public is vital for the continued growth and recovery of south Florida's American crocodile population.

## METHODS

### **Questionnaire Development**

Personal interviews were conducted during fall 2003 to obtain preliminary information on local perceptions and involvement regarding American crocodiles in south Florida. Three interviews were conducted on October 1, 2003 at Black Point Marina and three interviews were conducted on October 2, 2003 at Ocean Reef Club. Participants were asked permission to audio tape record the interview. Information regarding the surveyor, the surveyor's connection to the University of Florida, and the scientific reason for conducting the study were given to the participant (Appendix A). Basic questions concerning the individual's interactions with crocodiles, knowledge of crocodiles, perceptions of crocodiles, and attitudes toward crocodiles were asked. Four males and two females participated in the interviews. The primary purpose of the interviews was to aid development of a questionnaire that could quantitatively assess factors affecting stakeholder perceptions of and preferences for crocodile populations in south Florida.

Design of the questionnaire was adapted from Riley (1998) and reflected information gained from preliminary interviews. Pilot tests involving two draft versions of the questionnaire were conducted at Ocean Reef Club, Black Point Marina, and Everglades National Park (an initial study site) on October 28-30, 2003, respectively, to evaluate the survey design. Individuals at each of the three sites were informed of the research agenda, guaranteed privacy, invited to participate, and hand-delivered a

questionnaire (Appendix B). Participants returned the questionnaire to the surveyor upon completion. Seven individuals participated in the pilot study at Ocean Reef Club, nine at Black Point Marina, and ten at Everglades National Park. The final version of the questionnaire was completed on December 11, 2003.

### **Questionnaire Content**

The questionnaire formed a 12-page booklet and contained six primary subject areas: involvement with American crocodiles, knowledge of American crocodiles, risk beliefs associated with crocodiles, attitudes towards crocodiles, perceptions of current population trends, and preferences for future population trends (Appendix C). Questions about wildlife-related activities and information sources preceded questions regarding the topics of primary interest. Respondents were also asked to indicate acceptability of management tools, reveal subjective risk judgments regarding crocodiles, and provide information regarding resident status, age, gender, race, number of children and pets in household, level of formal education, income level, and community involvement. Space at the end of the questionnaire provided respondents the opportunity to make additional comments regarding crocodiles or the survey.

Involvement with American crocodiles was assessed using a continuum of potential experiences for respondents that ranged from no interaction, to observing a crocodile in the wild, to knowing a friend or family member who had an encounter with a crocodile, to being personally threatened by a crocodile or having pets or livestock threatened. Five additional experiences were vicarious in that the respondent only read or heard about crocodiles being threatened or killed by people, about people or pets being threatened or attacked by a crocodile, or about crocodiles raiding fish or crab traps. Respondents were asked to indicate which type of interaction with American crocodiles they or members of

their household had experienced. The experiences were classified into 5 levels (adapted from Riley and Decker 2000b):

- very high (respondent or family member personally threatened by a crocodile),
- high (respondent or family member had a friend, pet, or livestock threatened by a crocodile),
- moderate (respondent observed a crocodile in the wild or read/heard about people being threatened by a crocodile),
- low (family member observed a crocodile in the wild or read/heard about people being threatened by a crocodile, or participant or family member read/heard about crocodiles being threatened or killed by humans, about pets being threatened or attacked by a crocodile, or about crocodiles raiding fish or crab traps), and
- none (no experience with listed items).

Very few respondents (3.6%) were classified as having a very high involvement level and were therefore grouped with respondents in the high involvement category to form the variable INVOLVE, which had 4 levels: high, moderate, low, and none.

Five questions regarding the status, habitat, and behavior of crocodiles assessed respondents' knowledge level. Respondents were asked to circle the answer they believed correct for each of the questions. A team of experts confirmed one correct answer for each of the five questions. The number of correct answers for the five questions was summed for each respondent (adapted from Sinclair et al. 2003). Very few respondents (1.2%) answered all questions correctly and were therefore grouped with respondents who answered 4 questions correctly to form the variable KNOWLEDGE, which had 5 levels: no questions answered correctly, 1 question answered correctly, 2 questions answered correctly, 3 questions answered correctly, and 4 or 5 questions answered correctly.

Risk beliefs were measured using a 5-point semantic differential scale with adjective pairs as endpoints (Alreck and Settle 1995). The adjective pairs originated from Riley (1998), but were modified for relevance to crocodiles. A “Don’t Know” option was provided for all questions. Factor analysis (Manly 1986) indicated two components with one main factor: beliefs related to risks (RBELIEF), which encompassed personal and community risk, ability to live with risks, and voluntariness of risk acceptance (Table 1). Responses to the four items were averaged to create the variable RBELIEF (adapted from Sinclair et al. 2003). Respondents who answered “Don’t Know” to one or more of the six items (n = 61, 24%) did not receive a score for RBELIEF.

A 5-point Likert scale (Alreck and Settle 1995) ranging from disagree strongly to agree strongly assessed respondents’ attitudes towards crocodiles. Participants were asked to circle the number that represented their level of agreement or disagreement to a series of nine belief statements concerning crocodiles. A “No Opinion” option was provided for all questions. “No Opinion” responses were believed comparable to neither agreeing nor disagreeing with the statement and were recoded to the mid-point value on the 5-point progressive scale. Factor analysis indicated statements regarding economic considerations of crocodiles did not relate to the remaining belief statements. Subsequent factor analysis, excluding economic statements, produced two components with one main factor: attitudes related to the symbolism, benefits, rights, and threats of crocodiles (ATTITUDE, Table 2). The second component was an artifact of reverse coded statements. Responses to the seven items were averaged (weighted using factor loadings) to create the variable ATTITUDE (adapted from Jacobson and Marynowski 1997).

Table 1. Principal component analysis for response of questionnaire participants to semantic differential items related to risks from American crocodiles in south Florida.

	Component 1	Component 2
Eigenvalue	3.125	1.368
Percent Variance	40.181	17.104
Factor Loadings		
Do you believe the community is at no risk or great risk?	0.799 <sup>a</sup>	-0.252
People will be able or unable to learn to live with the risks associated with crocodiles?	0.786 <sup>a</sup>	-0.251
Do you believe that you are personally at no risk or great risk?	0.753 <sup>a</sup>	-0.289
Risks from American crocodiles are accepted voluntarily or involuntarily?	0.749 <sup>a</sup>	-0.110
The risks from having crocodiles in Florida are well or not well understood by experts?	0.556	0.202
The benefits and risks of American crocodiles to people are matched or mismatched?	0.541	0.217
Are encounters between American crocodiles and people a new event or an old event?	0.255	0.790
Are crocodile-human encounters increasing or decreasing in south Florida?	0.405	0.659

<sup>a</sup> Values for items used to form the variable RBELIEF.

Perceptions of current American crocodile population trends and preferences for future crocodile population trends were measured on 5-point progressive scales that ranged from decrease(d) greatly to increase(d) greatly. A “No Opinion” option was provided for all questions. Variables were created from perceptions of American crocodile population trends during 1998-2003 (CPOP) and preferences for crocodile population trends during 2004-2009 (FPOP). Both variables treated decreasing responses and stable or increasing responses as two separate categories (Riley and Decker 2000b).

Respondents who answered “No Opinion” did not receive a score for that variable (n = 72, 29% for CPOP and n = 49, 20% for FPOP).

Table 2. Principal component analysis for response of questionnaire participants to belief statements regarding American crocodiles in south Florida.

	Component 1	Component 2
Eigenvalues	2.594	1.097
Percent Variance	37.053	15.668
	Factor Loadings	
The presence of crocodiles in Florida increases my overall quality of life	0.749 <sup>a</sup>	-0.128
The presence of crocodiles near my home increases my overall quality of life	0.692 <sup>a</sup>	0.047
The presence of crocodiles is a sign of a healthy environment	0.638 <sup>a</sup>	-0.239
Crocodiles should have the right to exist wherever they may occur	0.561 <sup>a</sup>	-0.265
I think the crocodile is a likable species	0.536 <sup>a</sup>	-0.485
Crocodiles are an unacceptable threat to humans and pets	0.546 <sup>a</sup>	0.603 <sup>b</sup>
Crocodiles threaten people’s livelihoods by raiding fish and crab traps	0.496 <sup>a</sup>	0.594 <sup>b</sup>

<sup>a</sup> Values for items used to form the variable ATTITUDE.

<sup>b</sup> Reverse coded items.

### **Questionnaire Administration**

Three locations in south Florida were used for this study: Homestead Bayfront Park, Black Point Marina, and Ocean Reef Club. Homestead Bayfront Park and Black Point Marina provide recreational opportunities for permanent Florida residents, seasonal Florida residents, and visitors to Florida. Ocean Reef Club is an affluent community comprised mainly of seasonal residents. These sites were chosen because results from this study intend to be applicable to south Florida residents and visitors who effect, are affected by, or are concerned with crocodile management or recovery efforts. Individuals

who reside or recreate in the study areas have the potential to encounter an American crocodile and likely characterize the conceptual population for this study.

Homestead Bayfront Park is a 97-acre Miami-Dade County Park adjacent to south Biscayne Bay in Homestead, Florida (25° 27.8' N, 80° 19.2' W). American crocodiles are occasionally spotted in the waters surrounding the park. Black Point Marina is a 52-acre Miami-Dade County Park located in Cutler Ridge, Florida (25° 31.5' N, 80° 17.9' W). A resident American crocodile inhabits the waters surrounding Black Point Marina and has been encountered by marina patrons. Ocean Reef Club is a private community located in north Key Largo, Florida. It was founded in 1945 as a private fishing club and has grown to include deluxe private homes, vacation rentals, and a private marina. Ocean Reef Club members and employees periodically observe American crocodiles on community grounds.

A modified version of the hand-delivery method presented in Dillman et al. (1995) was utilized for adult patrons at Black Point Marina and Homestead Bayfront Park. Individuals over the age of 18 at each site were chosen indiscriminately to provide the best representative sample possible of adults visiting the area at the time of data collection. Upon the researcher's arrival to each of the study sites, the first individual over the age of 18 encountered by the researcher was approached and informed of the research agenda, guaranteed privacy, and invited to participate in the study (Appendix B). If the individual rejected the invitation to participate, the researcher thanked the individual for his time and then asked the next adult encountered to participate in the study. If the individual accepted the invitation to participate, the researcher hand-delivered a self-administered questionnaire to the individual. Upon completion of the

questionnaire, the researcher collected the survey from the participant and then asked the next adult encountered to participate in the study. Individuals over the age of 18 were approached as encountered, without regard to race, sex, or disabilities.

A modified version of the drop-off/pick-up method (Steele et al. 2001) was utilized for residents of Ocean Reef Club. Residents were hand-delivered self-administered questionnaires at a town hall meeting and asked to return completed surveys to the main office within one week.

Sampling periods consisted of at least one weekday and one weekend day at Black Point Marina and Homestead Bayfront Park. Sampling began in the morning and concluded early in the evening at each site on the days of data collection. Black Point Marina was sampled from December 27-31, 2003, and Homestead Bayfront Park was sampled from January 1-3, 16-18, and 23, 2004. Questionnaires were hand-delivered to Ocean Reef Club residents on January 16, 2004. Completed questionnaires were collected the following week from the main office.

Questionnaires were presented to 213, 226, and 114 individuals at Black Point Marina, Homestead Bayfront Park, and Ocean Reef Club, respectively. The overall response rate was 45% ( $n = 249$ ), with individual return rates equaling 50.2% ( $n = 107$ ), 45.6% ( $n = 103$ ), and 45% ( $n = 39$ ) for Black Point Marina, Homestead Bayfront Park, and Ocean Reef Club, respectively. The most frequent explanations given by respondents for not participating in the survey included inability to speak English, leaving to go boating, and time constraints.

### **Statistical Procedures**

All data were analyzed using SPSS Graduate Pack 12.0 for Windows (SPSS Inc. 2003). Missing data were excluded listwise for regression analyses and pairwise for all

other analyses. “Don’t Know” and “No Opinion” responses were excluded for descriptive statistics.

Multiple regression was used to construct a model that best predicted risk perceptions of crocodiles (adapted from Sinclair et al. 2003). Independent variables selected *a priori* included involvement with crocodiles, knowledge of crocodiles, attitudes towards crocodiles, perceptions of current crocodile population trends, and six demographic variables: age, gender, formal education (6 levels ranging from some high school to graduate degree or beyond), income (6 levels ranging from under \$20,000 to over \$500,000), children in household (yes or no), and community involvement (4 levels ranging from participation in no local organizations to participation in 3 or 4 organizations).

Logistic regression was used to construct a model that best predicted preferences for future crocodile population trends, a measure of wildlife stakeholder acceptance capacity for the American crocodile (Decker and Purdy 1988, Riley and Decker 2000b). Independent variables selected *a priori* included involvement with crocodiles, knowledge of crocodiles, attitudes towards crocodiles, perceptions of current crocodile population trends, risk perceptions of crocodiles, and six demographic variables: age, gender, formal education (6 levels ranging from some high school to graduate degree or beyond), income (6 levels ranging from under \$20,000 to over \$500,000), children in household (yes or no), and community involvement (4 levels ranging from participation in no local organizations to participation in 3 or 4 organizations).

Chi-square statistics were used to test for differences in proportions between variables, Pearson product-moment correlations were used to measure relationships

between variables, and differences between multiple means were tested using one-way Analysis of Variance.

## RESULTS

### **Survey Response**

The majority of respondents were male (64.3%), white (88.8%), and permanent Florida residents (75.1%). Respondents of Hispanic or Latino origin (22.2%) were likely under-represented in the sample population. The proportions of seasonal Florida residents (13.7%) and visitors to Florida (11.2%) were approximately equal.

Respondents ranged in age from 18 to 89, with a median age of 48. Formal education attainment was normally distributed, with 61.6% of respondents having completed some college or obtained a college degree. Most respondents did not have children at home (66.7%) and either had no pets (40.2%) or a dog (30.9%). More respondents belonged to religious (36.5%) or civic (21%) organizations than to environmental (14.9%) or school-based (12.9%) organizations.

### **Involvement with Wildlife and American Crocodiles**

Wildlife-related TV programs, videos, or movies were reported as the most common activities that bring people into contact with wildlife (Table 3). Over half of respondents indicated they visit zoos or aquariums, boat or fish in south Florida natural areas, or read about wildlife. Most respondents who boat or fish in south Florida natural areas are permanent or seasonal Florida residents. Nearly half of respondents observe or study wildlife outdoors and less hike or bike in south Florida natural areas or bird watch. Snorkeling and scuba diving were the most common self-reported activities by permanent

Table 3. Percent of questionnaire respondents who are permanent Florida residents, seasonal Florida residents, and visitors to Florida that indicated they participate in various outdoor and wildlife-related activities.

Activity	Permanent (n = 187)	Seasonal (n = 34)	Visitor (n = 28)	Combined (n = 249)
Watch wildlife TV programs, videos, or movies	80.7	82.4	75.0	80.3
Visit zoos or aquariums	69.0	76.5	53.6	68.3
Boat in south Florida natural areas	66.8	61.8	17.9	60.6
Fish in south Florida natural areas	65.8	55.9	7.1	57.8
Read about wildlife	55.1	61.8	60.7	56.6
Observe or study wildlife outdoors	46.0	44.1	50.0	46.2
Hike in south Florida natural areas	34.2	35.3	28.6	33.7
Bird watch	31.0	35.3	39.3	32.5
Bike in south Florida natural areas	27.3	17.6	25.0	25.7
Work on a farm or ranch	3.7	11.8	14.3	6.0
Other activities <sup>a</sup>	9.6	14.7	4.6	9.6

<sup>a</sup> Includes golfing, sailing, horseback riding, drag racing, snorkeling, scuba diving, hunting, playing music, surfing, and creating art.

Florida residents and golfing, snorkeling, and scuba diving were the most common self-reported activities by seasonal Florida residents.

Observing a crocodile in the wild was the most common type of involvement with American crocodiles experienced by respondents (Table 4). Though 63.5% of respondents indicated they had observed a crocodile in the wild, fewer than 4% reported a threatening experience. Permanent and seasonal Florida residents were more likely to have read or heard about crocodile interactions with pets, people, and automobiles and were twice as likely to know a friend or family member who had an encounter with a crocodile than visitors to Florida. Few respondents indicated having pets or livestock threatened or attacked by a crocodile.

The majority of respondents (53.4%) were classified as having a moderate level of involvement with American crocodiles (Figure 1). Visitors to Florida had a higher proportion of respondents in the no involvement category and a lower proportion of respondents in the moderate category than permanent or seasonal Florida residents. Visitors to Florida had no respondents in the very high category. Seasonal Florida residents had a greater proportion of respondents in the moderate and very high categories and a lower proportion of respondents in the no involvement and low categories than permanent Florida residents. Permanent Florida residents, seasonal Florida residents, and visitors to Florida had approximately equal proportions of respondents in the high involvement category. The mean level of involvement for respondents was 1.71 (SE = 0.062).

Table 4. Percent of questionnaire respondents who are permanent Florida residents, seasonal Florida residents, and visitors to Florida that indicated they had various involvement with American crocodiles in south Florida.

Involvement	Permanent (n = 187)	Seasonal (n = 34)	Visitor (n = 28)	Combined (n = 249)
Observed a crocodile in the wild	64.2	79.4	39.3	63.5
Read or heard of a crocodile being threatened or attacked by people	28.9	35.3	28.6	29.7
Read or heard about pets being threatened or attacked by a crocodile	24.1	32.4	21.4	24.9
Read or heard about other people being threatened or attacked by a crocodile	19.8	14.7	10.7	18.1
Read or heard about a crocodile being killed by an automobile	17.6	26.5	0.0	16.9
Know a friend, neighbor, or family member who had an encounter with a crocodile	14.4	14.7	7.1	13.7
Observed, read, or heard about fish or crab traps being raided by crocodiles	8.6	14.7	7.1	9.2
Have been personally threatened by a crocodile	3.7	5.9	0.0	3.6
Had a pet threatened or attacked by a crocodile	2.7	0.0	3.6	2.4
Had livestock threatened or attacked by a crocodile	2.1	2.9	3.6	2.4
Other types of experiences <sup>a</sup>	2.1	2.9	0.0	2.0

<sup>a</sup> Includes observing a crocodile on television or in captivity.

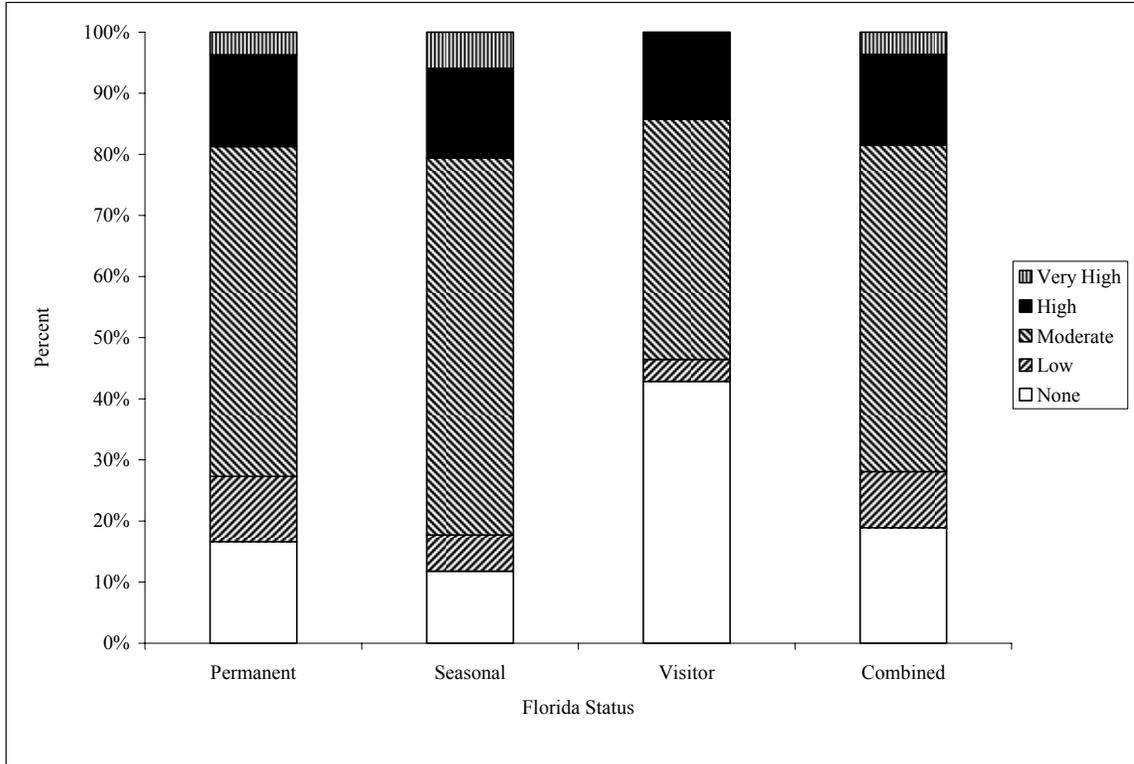


Figure 1. Percent of questionnaire respondents who are permanent Florida residents, seasonal Florida residents, and visitors to Florida with various levels of involvement with American crocodiles.

Correlations among variables are presented in Table 5 and correlations between variables and demographics are presented in Table 6. Involvement with crocodiles had a significant positive correlation with risk perceptions of crocodiles, income, and community involvement. Permanent Florida residents ( $F_{2,246} = 4.070$ ,  $p = 0.040$ ) and seasonal Florida residents ( $F_{2,246} = 4.070$ ,  $p = 0.029$ ) had higher levels of involvement with crocodiles than visitors to Florida. Involvement with crocodiles did not differ significantly between permanent Florida residents and seasonal Florida residents, between males and females, or between respondents with and without children at home.

Table 5. Pearson correlation coefficients for the six main questionnaire variables.

Variable <sup>a</sup>	INVOLVE	KNOWLEDGE	RBELIEF	ATTITUDE	CPOP	FPOP
INVOLVE	1	0.043	0.147*	-0.028	0.095	0.010
KNOWLEDGE		1	-0.160*	0.241**	0.157*	0.061
RBELIEF			1	-0.454**	0.104	-0.461**
ATTITUDE				1	0.000	0.425**
CPOP					1	-0.076
FPOP						1

<sup>a</sup> INVOLVE = involvement with crocodiles, KNOWLEDGE = knowledge of crocodiles, RBELIEF = risk perceptions of crocodiles, ATTITUDE = attitudes towards crocodiles, CPOP = perceptions of current crocodile population trends, and FPOP = preferences for future crocodile population trends.

\* Correlation is significant at the 0.05 level (2-tailed).

\*\* Correlation is significant at the 0.01 level (2-tailed).

Table 6. Pearson correlation coefficients between the six main questionnaire variables and age, education, income, and community involvement.

Variable <sup>a</sup>	Age	Education	Income	Community involvement
INVOLVE	0.039	-0.023	0.139*	0.179**
KNOWLEDGE	0.080	0.087	0.113	0.082
RBELIEF	-0.011	-0.049	0.044	0.035
ATTITUDE	-0.209**	0.087	-0.081*	-0.061
CPOP	0.204**	0.040	0.022	-0.086
FPOP	-0.067	0.045	-0.108	0.002

<sup>a</sup> INVOLVE = involvement with crocodiles, KNOWLEDGE = knowledge of crocodiles, RBELIEF = risk perceptions of crocodiles, ATTITUDE = attitudes towards crocodiles, CPOP = perceptions of current crocodile population trends, and FPOP = preferences for future crocodile population trends.

\* Correlation is significant at the 0.05 level (2-tailed).

\*\* Correlation is significant at the 0.01 level (2-tailed).

### **Crocodile Knowledge**

Nearly all respondents (91.2%) knew American crocodiles existed in Florida and many (58.1%) were aware that the crocodile is federally-listed as endangered. Few respondents (14.9%) thought the American crocodile is neither a threatened nor endangered federally-listed species. Half of respondents (51.4%) believed the crocodile occurs in Florida, Central America, Louisiana, and Mississippi. Only 18.0% knew the crocodile occurs in both Florida and Central America. Most respondents (82.7%) correctly identified that American crocodiles are found in brackish or saltwater estuaries.

Few (14.1%) thought crocodiles live in freshwater streams or lakes and almost none (0.8%) thought crocodiles live in the open ocean.

The majority of respondents (60.2%) did not know if there has been a documented American crocodile attack on a human in south Florida. Nearly one-fourth (22.9%) believed there has been a documented attack and fewer (16.9%) proclaimed there has not been one. The greatest proportion of people (40.2%) believed American crocodiles are more aggressive than American alligators. One-fourth of respondents (24.4%) thought the crocodile is less aggressive than the alligator and one-third (35.4%) believed the two species to be equally aggressive.

The majority of respondents answered 1 (27.3%) or 2 (39.8%) of the 5 questions regarding the status, habitat, and behavior of crocodiles correctly and 18.1% correctly answered 3 questions. Few respondents (9.2%) answered 4 or 5 questions correctly and less (5.6%) answered no questions correctly. The mean level of knowledge for respondents was 1.98 (SE = 0.065). Knowledge of crocodiles had a significant negative correlation with risk perceptions of crocodiles and a significant positive correlation with attitudes towards crocodiles and perceptions of current crocodile population trends. Knowledge of crocodiles did not differ significantly between permanent Florida residents, seasonal Florida residents, and visitors to Florida, between males and females, or between respondents with and without children at home.

### **Information Avenues**

Overall, more people reported receiving information regarding American crocodiles and American alligators (*Alligator mississippiensis*) from newspapers or television news stations than state or federal agencies, non-profit organizations, or the U.S. Fish and Wildlife Service during the six months prior to completing the

questionnaire (Table 7). Respondents were more than twice as likely to have obtained a great deal of information regarding American crocodiles and American alligators from newspapers or TV news stations than federal or state government or non-profit organizations. The highest percentage of people indicated receiving a great amount of information about American crocodiles from the U.S. Fish and Wildlife Service. Over half of respondents reported hearing or seeing no information about the American crocodile or American alligator from federal and state government, non-profit organizations, or the U.S. Fish and Wildlife Service.

The mean level of information received by respondents from all sources was higher for the American alligator than American crocodile for the six month period prior to completing the questionnaire (Table 7). There is a significant difference in mean amount of information received for the two species from newspapers or TV news stations ( $t = 2.74, p = .006$ ) and from the federal government ( $t = 2.4, p = .014$ ).

Most respondents indicated they would utilize wildlife television programs (71.5%), the internet (67.5%), and books, magazines, or journals (62.2%) to learn more about the American crocodile. A smaller number of respondents reported they would use newspaper articles (21.3%) to find information on crocodiles and few indicated they would seek information from non-profit organizations (12.9%) or government agencies (12.4%).

### **Attitudes Towards American Crocodiles**

Few respondents lacked an opinion on whether crocodiles could benefit the local economy (6.4%), should have the right to exist wherever they may occur (4.4%), are an unacceptable threat (6.0%), or are a likable species (7.6%). More respondents lacked an opinion on whether the presence of crocodiles in Florida (18.5%) or near their home

Table 7. Percent of questionnaire respondents that indicated they heard or saw various amounts of information about the American crocodile and American alligator from different sources during the six months prior to completing the questionnaire.

Species <sup>a</sup>	Source	None	Little	Moderate	Considerable	Great	Mean <sup>b</sup>	SE
American crocodile	Newspapers or TV news station	44.9	21.8	20.2	6.2	7.0	2.03	0.079
	Federal government	66.7	17.0	6.5	3.0	1.3	1.44	0.056
	State government	62.8	22.5	8.2	3.5	3.0	1.62	0.065
	Non-profit organization	59.4	18.8	12.4	6.8	2.6	1.70	0.070
	U.S. Fish and Wildlife Service	53.6	19.2	12.1	6.7	8.4	1.91	0.084
American alligator	Newspapers or TV news station	31.1	24.6	25.4	11.1	7.8	2.34	0.080
	Federal government	61.0	20.3	12.6	4.3	1.7	1.64	0.064
	State government	57.8	19.1	13.5	7.0	2.6	1.77	0.072
	Non-profit organization	56.2	18.9	14.6	6.9	3.4	1.80	0.074
	U.S. Fish and Wildlife Service	50.6	18.7	17.0	5.8	7.9	1.94	0.082

<sup>a</sup> Date presented in this table should be interpreted with caution, because accurate steps were not taken to ensure respondents clearly remembered or comprehended whether crocodiles or alligators (species similar in appearance) were represented in the media or other information avenues.

<sup>b</sup> Scores were derived from a 5-point progressive scale, with 1 indicating no information received to 5 indicating a great deal of information received.

(11.6%) increased quality of life or whether the presence of crocodiles signals a healthy environment (10.8%) or decreases property value (13.7%). Nearly one-fourth (23.3%) of respondents had no opinion on whether crocodiles threaten people's livelihoods by raiding fish and crab traps.

Visitors to Florida were more likely to answer "No Opinion" to 5 or more questions regarding attitudes towards crocodiles than permanent or seasonal Florida residents ( $\chi^2_2 = 20.099, p < .001$ ). Age, gender, children in household, education level, income level, and community involvement did not affect the number of "No Opinion" responses to questions regarding attitudes towards crocodiles.

Attitudes towards American crocodiles were generally favorable among respondents who offered an opinion. Based upon a progressive scale from 1 to 5, where 1 was a very negative attitude and 5 was a very positive attitude, the mean score was greater than 3.0 for eight of nine belief statements regarding American crocodiles in south Florida (Table 8). Most respondents (72.5%) believed the presence of crocodiles signals a healthy environment and many indicated having crocodiles in Florida increased their quality of life. The majority of respondents (58.1%) did not consider crocodiles an unacceptable threat to humans or pets and nearly half (46.7%) thought crocodiles should have the right to exist wherever they may occur. However, over half (53.2%) expressed concern about living close to crocodiles by disagreeing with the idea that overall quality of life would increase if crocodiles resided near their home, and responses were divided on whether the crocodile is a likable species and whether the presence of crocodiles decreases property value. Most respondents (59.1%) did not believe crocodiles threaten

Table 8. Response of questionnaire participants to belief statements regarding American crocodiles in south Florida.

Belief Statements <sup>a</sup>	% response			Mean	SE
	Disagree	Neither	Agree		
The presence of crocodiles is a sign of a healthy environment	6.8	20.7	72.5	4.05	0.068
The presence of crocodiles in Florida increases my overall quality of life	19.2	36.9	43.9	3.37	0.083
The presence of crocodiles near my home increases my overall quality of life	53.2	31.4	15.4	2.38	0.083
The presence of crocodiles decreases property value	44.1	25.6	30.3	2.71 <sup>b</sup>	0.091
Crocodiles could benefit the local economy by being a tourism attraction	19.3	26.2	54.5	3.54	0.085
Crocodiles should have the right to exist wherever they may occur	29.4	23.9	46.7	3.32	0.091
Crocodiles are an unacceptable threat to humans and pets	58.1	21.4	20.5	2.41 <sup>c</sup>	0.087
I think the crocodile is a likable species	27.4	31.3	41.3	3.20	0.085
Crocodiles threaten people's livelihoods by raiding fish and crab traps	59.1	26.2	14.7	2.24 <sup>d</sup>	0.092

<sup>a</sup> Scores were derived from a 5-point progressive scale, where 1 indicated strong disagreement, 5 strong agreement, and 3 neither agreement nor disagreement with the statement.

<sup>b,c,d</sup> Reverse coded values equal 3.29, 3.59, and 3.76, respectively.

people's livelihoods by raiding fish or crab traps and many (54.5%) supported the idea that crocodiles could benefit the local economy by being a tourism attraction.

Attitudes towards crocodiles had a significant positive correlation with knowledge of crocodiles and preferences for future crocodile population trends and a significant negative correlation with risk perceptions of crocodiles, age, and income. Males ( $t_{247} = 2.414$ ,  $p = 0.016$ ) had more positive attitudes than females. Permanent Florida residents had more positive attitudes towards crocodiles than seasonal Florida residents ( $F_{2,246} = 3.529$ ,  $p = 0.037$ ). Attitudes towards crocodiles did not differ significantly between permanent Florida residents and visitors to Florida, between seasonal Florida residents and visitors to Florida, or between respondents with and without children at home.

### **Acceptance of Management Tools**

Most respondents deemed it acceptable to relocate an American crocodile if discovered on a golf course (69.2%), on school property (80.5%), or in a swimming pool (81.3%), but only 31% indicated relocation as acceptable if a crocodile is found where people boat (Figure 2). Very few respondents considered euthanasia an acceptable management tool for an American crocodile found on a golf course (4.5%), on school property (11.4%), in a swimming pool (7.8%), or where people boat (6.1%, Figure 3). Over half of respondents believed relocating a crocodile to be acceptable if the crocodile kills or injures a pet or human, but fewer considered euthanasia an acceptable management tool for crocodiles that kill or injure humans or pets.

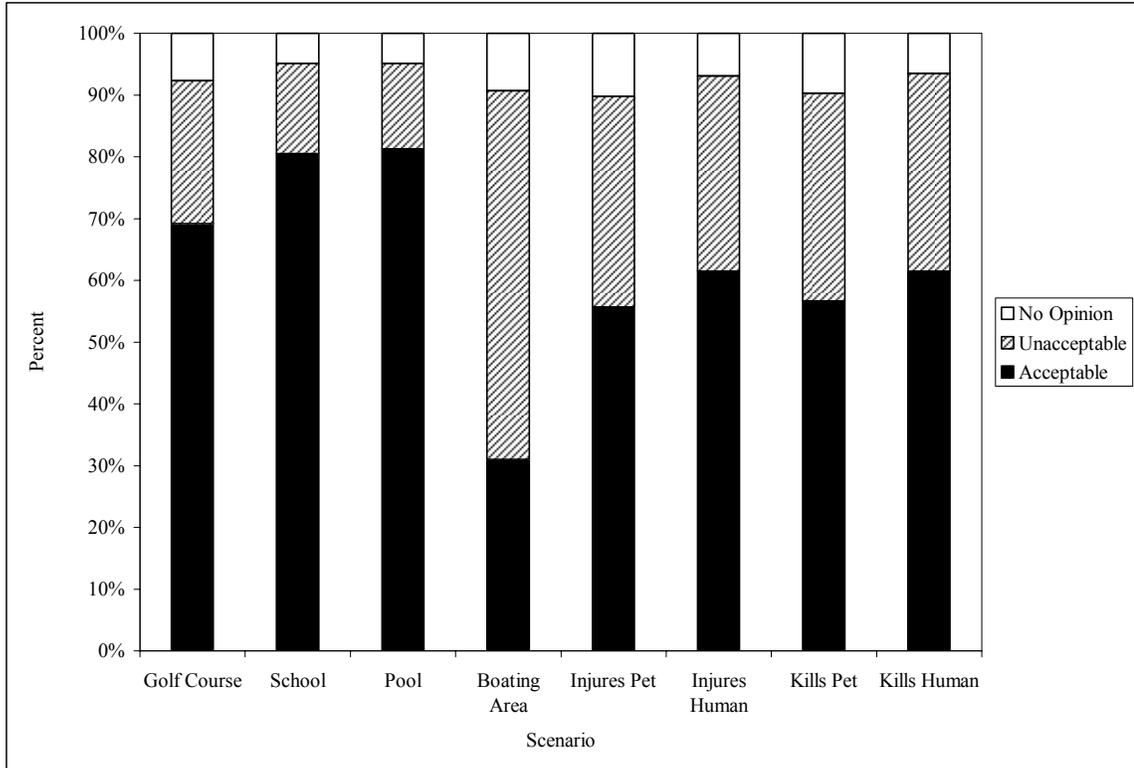


Figure 2. Percent of questionnaire respondents that indicated relocation to be an acceptable or unacceptable management tool for American crocodiles involved in various scenarios.

### Perceptions of Recent American Crocodile Population Trends

The greatest proportion of respondents (38.6%) believed the American crocodile population in south Florida had increased during 1998-2003 (Figure 4). Over one-fourth of respondents (28.9%) indicated they did not know what the population trend had been over the previous 5 years and 22.1% believed the population had decreased. Few respondents (10.4%) thought the American crocodile population had remained the same from 1998-2003.

An equal proportion of permanent Florida residents and visitors to Florida believed the American crocodile population had remained stable during the previous 5 years. Visitors to Florida had nearly twice the proportion of respondents who did not know what the population trend had been during 1998-2003 and approximately half the proportion of

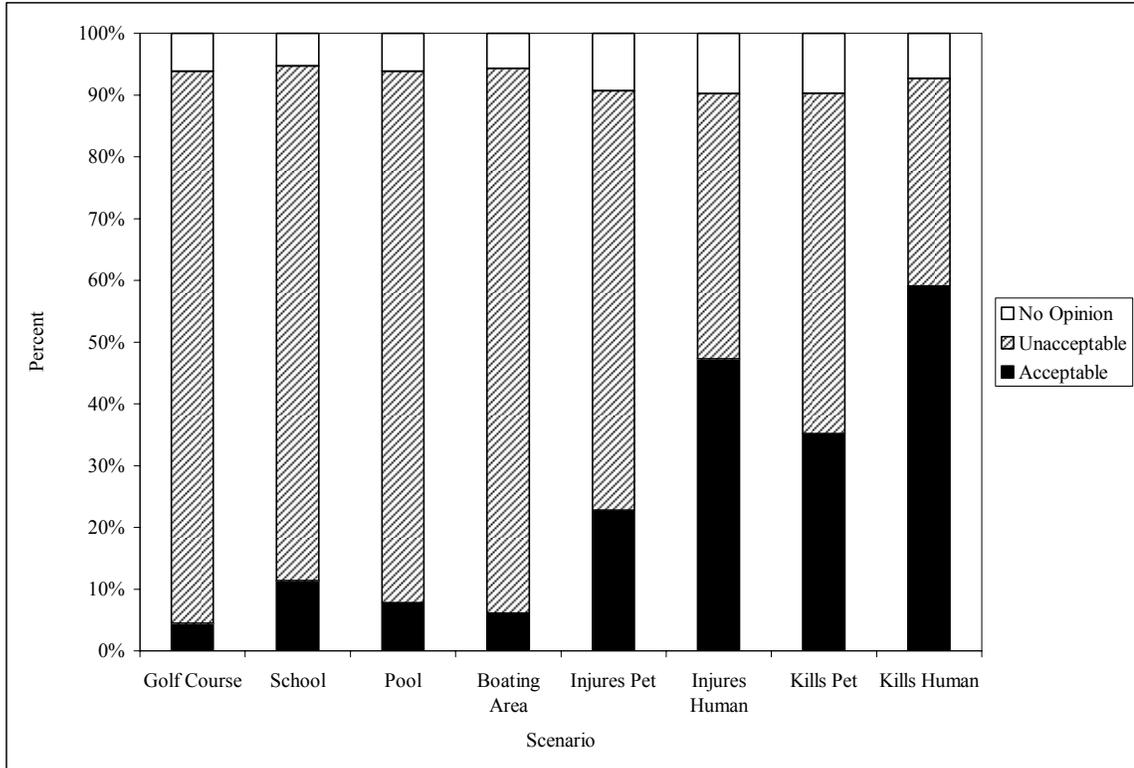


Figure 3. Percent of questionnaire respondents that indicated euthanasia to be an acceptable or unacceptable management tool for American crocodiles involved in various scenarios.

respondents who believed the crocodile population had increased than permanent and seasonal Florida residents. Permanent Florida residents and seasonal Florida residents had roughly equal proportions of respondents who did not know what the population trend had been or believed the population had increased over the previous five years. Fewer proportion of visitors believed the American crocodile population had decreased during 1998-2203 than permanent or seasonal Florida residents.

Perceptions of current crocodile population trends had a significant positive correlation with knowledge of crocodiles and age and a significant association with gender ( $\chi^2_1 = 5.829$ ,  $p = 0.016$ ). There was no significant association between perceptions of current crocodile population trends and permanent Florida residents,

seasonal Florida residents, and visitors to Florida or between perceptions of current crocodile population trends and respondents with and without children at home.

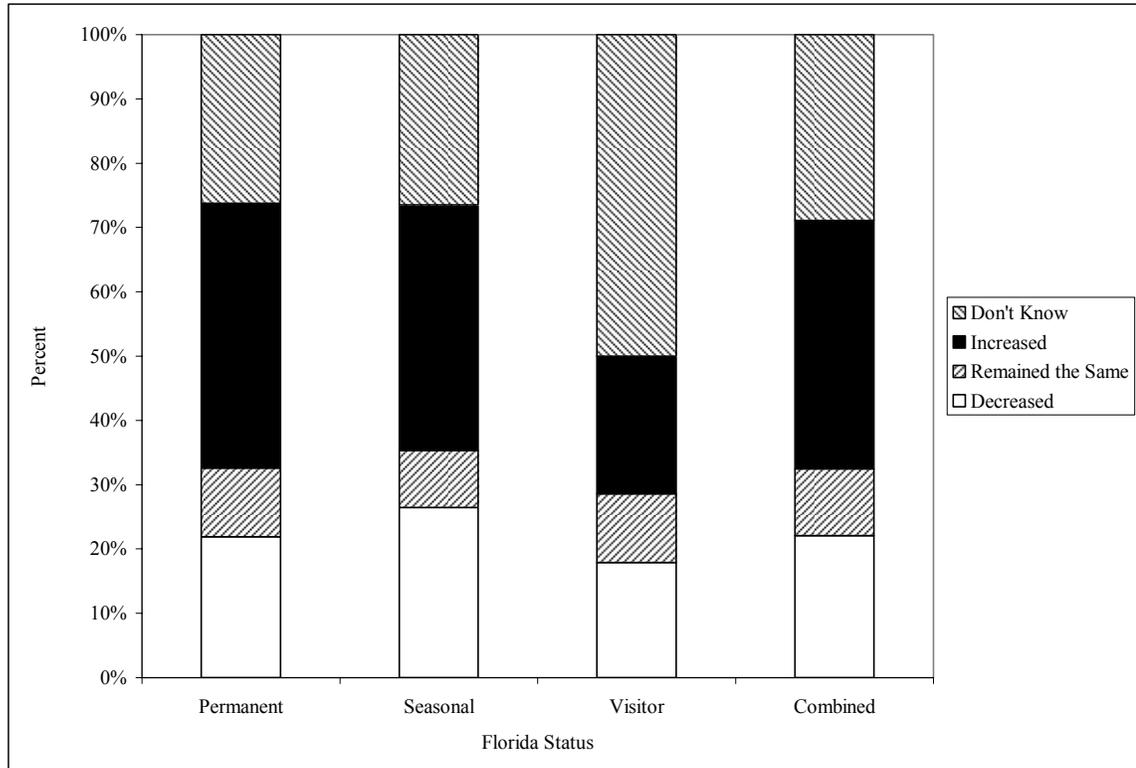


Figure 4. Percent of questionnaire respondents who are permanent Florida residents, seasonal Florida residents, and visitors to Florida that believed the American crocodile population in south Florida either increased, decreased, or remained the same during 1998-2003.

### **Risk Beliefs about American Crocodiles**

The proportions of respondents that answered “Don’t Know” for questions about personal risk (9.7%), community risk (11.3%), ability to live with risk (12.1%), and voluntariness of risk (16.9%) were less than the proportions for questions regarding knowledge of experts (27.4%) and association of benefits and risks (37.5%) from American crocodiles. Some respondents were also unsure if encounters between American crocodiles and humans are a new or an old event (27.4%) or if encounters are increasing or decreasing (35.5%).

Older individuals ( $r = .217$ ,  $p = .001$ ) and those engaged in low community involvement ( $r = -.137$ ,  $p = .031$ ) were more likely to answer “Don’t Know” to 5 or more questions regarding risk beliefs of crocodiles than younger respondents or those engaged in high community involvement. Residency status, gender, children in household, education level, and income level did not affect the number of “Don’t Know” responses to questions regarding risk beliefs of crocodiles.

The majority of respondents who answered along the progressive scale did not consider encounters between American crocodiles and people as something new, and many did not perceive encounters to be increasing (Table 9). Very few respondents believed they were personally at risk or that communities were at risk from American crocodiles. Most respondents indicated they could learn to live with the risks and that risks from crocodiles were generally accepted voluntarily. Many respondents felt that experts adequately understood risks from crocodiles. A slight discrepancy existed concerning people who benefit from American crocodiles and those who are exposed to potential risks.

Risk perceptions of crocodiles had a significant positive correlation with involvement with crocodiles and a significant negative correlation with knowledge of crocodiles, attitudes towards crocodiles, and preferences for future crocodile population trends. Risk perceptions of crocodiles did not differ significantly between permanent Florida residents, seasonal Florida residents, and visitors to Florida, between males and females, or between respondents with and without children at home.

Table 9. Response of questionnaire participants to semantic differential items related to risks from American crocodiles in south Florida.

Semantic Differential Item <sup>a</sup>	Scale <sup>b</sup>					Semantic Differential Item <sup>a</sup>	Mean	SE
	1	2	3	4	5			
Encounters between American crocodiles and people are... <b>New</b>	7.8	8.9	24.4	20.6	38.3	<b>Old</b>	3.73	0.095
The frequency of human-crocodile encounters are... <b>Increasing</b>	17.5	28.1	23.8	9.4	21.3	<b>Decreasing</b>	2.89	0.110
You are personally at... <b>No Risk</b>	63.8	15.6	14.3	4.0	2.2	<b>Great Risk</b>	1.65	0.068
The community is at... <b>No Risk</b>	40.9	35.0	17.3	3.6	3.2	<b>Great Risk</b>	1.93	0.068
You are... <b>Able to</b> live with the risks associated with crocodiles	50.5	23.9	12.8	8.3	4.6	<b>Unable to</b>	1.93	0.079
The risks from American crocodiles are accepted... <b>Voluntarily</b>	42.7	22.3	18.9	7.8	8.3	<b>Involuntarily</b>	2.17	0.090
The risks from crocodiles... <b>Are</b> well understood by experts	34.4	25.6	21.1	10.0	8.9	<b>Are not</b>	2.33	0.096
The benefits and risks of American crocodiles to people are... <b>Matched</b>	27.1	18.1	29.7	11.0	14.2	<b>Mismatched</b>	2.67	0.109

<sup>a</sup> Respondents indicated the number between two words that best represented their opinion.

<sup>b</sup> Values given are percent response for each step along the progressive 1-5 scale.

### Subjective Risk Perceptions of American Crocodiles

Subjective risk perceptions of American crocodiles were generally low. Nearly all respondents believed getting into a motorcycle accident (82.7%), getting into a car accident (81.1%), getting injured while working for a timber company (77.0%), and dying as a result of cancer (70.8%) were more likely to occur than being attacked by an American crocodile in south Florida (Table 10). Responses were divided on the possibility of being attacked by an alligator versus a crocodile and 46.5% of respondents felt getting attacked by a shark was more likely to occur than getting attacked by a crocodile. Most respondents felt the likelihood of having an accident while driving a tractor (69.1%) or becoming a murder victim (60.9%) was greater than being attacked by an American crocodile in south Florida, and nearly one-half of respondents (46.1%) considered getting into a commercial airline crash more likely to occur than being attacked by a crocodile.

Table 10. Response of questionnaire participants to the likelihood of experiencing various risks versus being attacked by an American crocodile.

Risk	% response		
	More Likely	Less Likely	Unsure
Getting into an accident if you ride a motorcycle	82.7	13.2	4.1
Getting into a car accident	81.1	13.6	5.3
Getting injured if you work for a timber company	77.0	13.5	9.5
Dying as a result of cancer	70.8	16.4	12.8
Having an accident if you drive a tractor	69.1	18.6	12.3
Becoming a murder victim	60.9	19.3	19.8
Getting attacked by a shark	46.5	28.4	25.1
Getting into a commercial airline crash	46.1	34.1	19.8
Being attacked by an alligator	33.3	30.5	36.2

### **Factors Affecting Risk Beliefs about American Crocodiles**

Regression analysis indicated attitudes toward crocodiles had a significant effect on risk perceptions of crocodiles, in a model that explained 26.0% of the variance (Table 11). Since knowledge of crocodiles is not a significant predictor of risk perceptions, but is negatively correlated with risk perceptions and is a significant predictor of attitudes towards crocodiles ( $B = .102, p \leq .001$ ), knowledge of crocodiles may have an indirect effect on risk perceptions of crocodiles through attitudes towards crocodiles (Figure 5).

Next, a stepwise regression ( $p < 0.05$  cutoff value) was run to identify variables with maximum predictive power. Attitudes toward crocodiles formed the most parsimonious model to predict risk perceptions of crocodiles, in a model that explained 23.0% of the variance. The coefficients for the regression equation, with SE in parentheses, were  $RBELIEF_{(predicted)} = 3.592 (0.301) - 0.860 (0.142) ATTITUDE$ . People who expressed negative attitudes towards crocodiles had the greatest probability of considering crocodiles a high risk to humans.

### **Preferences for Future American Crocodile Population Trends**

The greatest proportion of respondents (42.6%) indicated they wanted American crocodile populations to increase over the next five years (Figure 6). Only 8.8% expressed a preference for fewer crocodiles and over one-fourth of respondents (28.9%) wanted populations to remain the same. Nearly 20% of respondents did not care whether crocodile populations increased, decreased, or remained stable from 2004-2009.

Table 11. Regression model for prediction of risk perceptions of American crocodiles (RBELIEF).

Variable <sup>a</sup> ( $R^2 = .260, p \leq .001$ )	B	SE B	$\beta$
INVOLVE	0.024	0.071	0.029
KNOWLEDGE	0.013	0.069	0.017
ATTITUDE	-0.920	0.160	-0.513*
CPOP	0.196	0.157	0.109
Age	-0.008	0.005	-0.156
Gender	-0.029	0.150	-0.016
Education	-0.014	0.053	-0.022
Children	-0.039	0.150	-0.022
Income	0.005	0.053	0.008
Community involvement	0.061	0.058	0.067

<sup>a</sup> INVOLVE = involvement with crocodiles, KNOWLEDGE = knowledge of crocodiles, ATTITUDE = attitudes towards crocodiles, and CPOP = perceptions of current crocodile population trends.

\*  $p \leq .001$ .

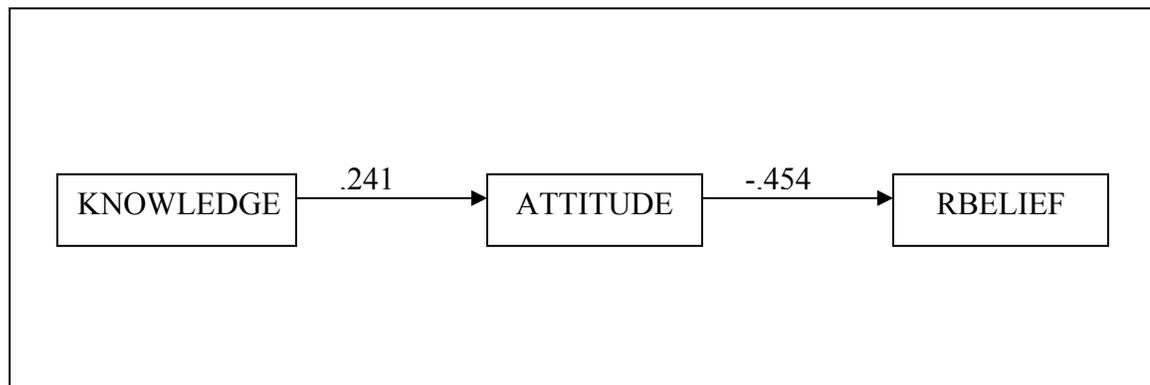


Figure 5. Path diagram for risk perceptions of American crocodiles (RBELIEF), with path coefficients added. KNOWLEDGE = knowledge of crocodiles and ATTITUDE = attitudes towards crocodiles.

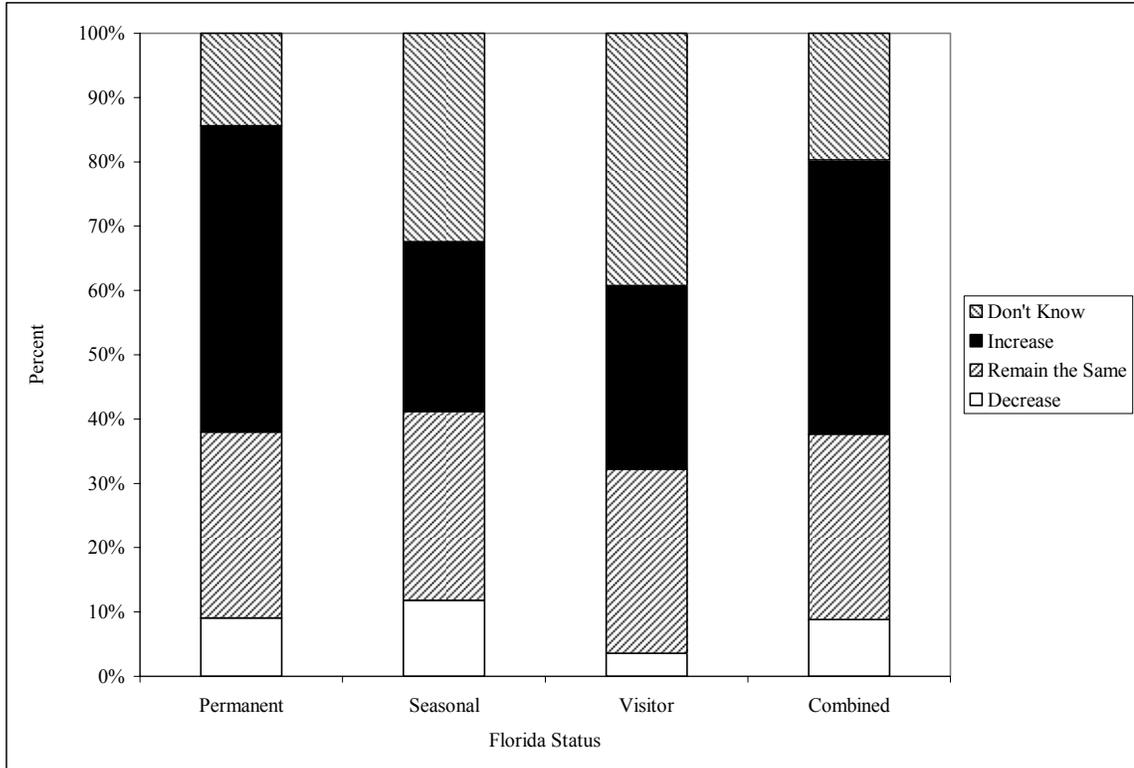


Figure 6. Percent of questionnaire respondents who are permanent Florida residents, seasonal Florida residents, and visitors to Florida that revealed preferences for a smaller, larger, or similar American crocodile population in south Florida for 2004-2009.

Permanent Florida residents, seasonal Florida residents, and visitors to Florida had nearly equal proportions of respondents who wanted American crocodile populations to remain the same over the next five years. The proportion of people who preferred a decrease in the crocodile population was greatest for seasonal Florida residents and least for visitors to Florida. A greater proportion of permanent Florida residents desired a larger crocodile population than seasonal Florida residents or visitors to Florida. Seasonal Florida residents and visitors to Florida were more than twice as likely to lack an opinion regarding future crocodile populations than permanent Florida residents.

Overall, 44.5% of respondents indicated it was important to them personally that the actual American crocodile population trend match their expressed preference.

Approximately equal proportions of respondents did not have an opinion (19.7%) or indicated it was unimportant (16.5%) to them that their preferences were not realized. Permanent Florida residents (46.6%) and seasonal Florida residents (44.1%) were more concerned that their preferred population trend matches the actual trend than visitors to Florida (32.1%).

### **Factors Affecting Preferences for American Crocodile Populations**

Logistic regression analysis indicated risk perceptions of crocodiles and attitudes towards crocodiles had a significant effect on desired future crocodile population trends in a model that predicted 94.0% of respondents' preference for future crocodile population trends (Table 12). A stepwise regression ( $p < 0.05$  cutoff value) was run to identify variables with maximum predictive power. Risk perceptions of crocodiles and attitudes toward crocodiles formed the most parsimonious model to predict desired future crocodile population trends. The coefficients for the logistic regression equation, in stepwise order with SE in parentheses, were  $\log(P_i)/(1 - P_i) = -0.706 (2.499) - 1.502 (0.453) RBELIEF + 3.184 (1.297) ATTITUDE$ , where  $P_i$  = probability that a respondent will desire a stable or larger crocodile population.

The equation correctly predicted the desired future population trend for 53.3% of respondents who chose a smaller crocodile population and 99.0% of respondents who chose a stable or larger crocodile population. Overall, the equation predicted 94.0% of respondents' preference for future crocodile population trends. People who believed crocodiles presented a low risk to humans and expressed positive attitudes towards crocodiles had the greatest probability of preferring a stable or increased future crocodile population.

Table 12. Logisitic regression model for prediction of desired future American crocodile population trends (FPOP).

Variable <sup>a</sup> (Nagelkerke R <sup>2</sup> = .571, p ≤ .001)	B	SE B	Wald
INVOLVE	-0.357	0.478	0.556
KNOWLEDGE	0.423	0.510	0.688
RBELIEF	-1.652	0.505	10.701**
ATTITUDE	3.487	1.450	5.783*
CPOP	0.647	0.946	0.468
Age	0.032	0.032	1.006
Gender	0.420	1.007	0.174
Education	-0.102	0.297	0.118
Children	-0.496	0.896	0.307
Income	-0.278	0.317	0.765
Community involvement	0.217	0.496	0.191

<sup>a</sup> INVOLVE = involvement with crocodiles, KNOWLEDGE = knowledge of crocodiles, RBELIEF = risk perceptions of crocodiles, ATTITUDE = attitudes towards crocodiles, and CPOP = perceptions of current crocodile population trends.

\* p < .05. \*\* p ≤ .001.

## DISCUSSION

South Florida residents and visitors generally have low risk perceptions of and favorable attitudes towards American crocodiles. Many people perceive benefits from crocodiles as indicated by the common response that crocodiles signify a healthy environment and increase overall quality of life in Florida. Although over half of respondents expressed concern about crocodiles living near their home, most did not feel personally threatened by crocodiles. The acceptance capacity for crocodiles expressed by many respondents was high. However, continued human population growth and residential development in south Florida will increase potential for human-crocodile encounters near human habitation. Effective methods for resolving these interactions, as well as crocodile-related complaints, need to be developed.

Attitudes towards American crocodiles significantly influenced both risk perceptions of and acceptance capacity for crocodiles. Ability to influence attitudes is a complex and debated subject (Gardner and Stern 1996, Hines et al. 1986, Hungerford and Volk 1990, Trumbo 1999). Simply providing more facts will not necessarily result in more favorable attitudes (Reading and Kellert 1993). However, comprehensive knowledge is a necessary condition for stable beliefs (Fischhoff 1995). Results from this study indicate that high knowledge of crocodiles corresponds with positive attitudes towards crocodiles. People with positive attitudes towards crocodiles were more likely to have lower risk perceptions of and higher acceptance capacities for crocodiles. Overall knowledge of crocodiles and information received regarding crocodiles was rather low,

indicating opportunity for outreach efforts to increase such knowledge. Most respondents revealed they would utilize internet sources to learn more about American crocodiles. The internet is very cost effective and likely the best method for presenting information regarding crocodiles to a large number of people. Communication targeted towards increasing knowledge of, and thus favorable attitudes towards, crocodiles will likely reduce risk perceptions of and increase acceptance capacity for the crocodile (Knuth et al. 1992).

To further increase acceptance of American crocodiles, education campaigns need to address risks of crocodiles as well as benefits crocodiles provide (Fischhoff 1995, Knuth et al. 1992). Simply explaining that risks from crocodiles are low compared to other generally accepted high risk activities, such as driving automobiles, will be ineffective unless benefits from crocodiles are also represented (Fischhoff 1995). People accept risks from driving automobiles because benefits received from the act are high. To willingly accept low risks from crocodiles, people need to be aware of and appreciate benefits from crocodiles. Results from this study are encouraging because the majority of respondents consider risks from crocodiles to be low and benefits from crocodiles to be rather high. A base of conservation-oriented values exists on which to build more positive attitudes towards American crocodiles.

A “Not in my backyard!” attitude was detected though when respondents were asked about quality of life regarding crocodiles near their home. Many respondents were unaware there has never been a documented American crocodile attack on a human in south Florida and believed crocodiles were more aggressive than alligators, which may have contributed to concern for crocodiles near their home. Wildlife management has

traditionally used translocation to separate a potentially dangerous animal from situations that may result in heightened concern among stakeholders (Riley et al. 1994). Most respondents indicated translocation as an acceptable tool for American crocodiles found near human habitation. Given the potential for injury or distress during relocation, however, American crocodiles present a challenge to wildlife managers since federally-listed species cannot be harmed under Section 7 of the Endangered Species Act. Florida residents, accustomed to having alligators promptly removed from private property, can become alarmed if similar procedures are not applied to crocodiles.

Modification of human behaviors offers managers an alternative to direct removal or relocation of crocodiles. Appropriate personal decisions can reduce personal risk far greater than any government actions (Keeney 1995, Zeckhauser and Viscusi 1990). Just as life can never be risk free, risks from crocodiles can not be eliminated (Keeney 1995). There are, however, steps that can be taken to reduce personal risks from crocodiles (e.g., never feed crocodiles, do not discard fish scraps at boat ramps or near water's edge, do not swim where crocodiles live, fencing). Educational programs aimed at teaching appropriate behavior in the presence of crocodiles can lead to feelings of empowerment and a sense of security, subsequently reducing risk perceptions of crocodiles. Effort directed towards ameliorating voluntary risks (Zeckhauser and Viscusi 1990) can have more impact than removing or relocating crocodiles.

Respondents indicated receiving more information regarding American crocodiles from newspapers or television news stations than any other information source provided. Mass media influence is an important consideration for forming attitudes and risk perceptions (Coleman 1993, Park et al. 2001). Television reports that convey negative or

dangerous events can result in increased levels of fear among some audience members (Coleman 1993). Negative events carry greater weight, are more visible or noticeable, and are more likely to have a powerful effect than positive events (Slovic 1993). Given that most of what the media reports is negative (Slovic 1993), and that respondents obtained most of their information about crocodiles from mass media sources, concern for negative mass media messages producing negative attitudes towards crocodiles exists.

The current study did not confirm if information received by respondents was positive or negative, however. Future studies clearly testing the effects of negative media messages on risk perceptions of crocodiles, or other potentially dangerous animals, would enhance findings of this study. Since some individuals use expert opinion and perceived social consensus to make risk judgments (Trumbo 1999), and respondents indicated a high level of trust in expert opinion, media reports and education campaigns that reveal south Florida residents, visitors, and experts low risk judgments of crocodiles could combat negative media messages and decrease risk perceptions of crocodiles.

Findings from this study are consistent with Riley and Decker (2000b) who studied acceptance capacity for mountain lions. Risk perceptions and attitudes were significant predictors of desired future population trends in both studies. This study, however, did not find a correlation between perceptions of current population trends and acceptance capacity for the crocodile. Demographic variables can significantly affect perceptions of and attitudes towards large predators (Kellert 1985b, Kellert and Berry 1987, Kleiven et al. 2004). Riley and Decker (2000b), however, found children in household, gender, and level of formal education did not significantly contribute to acceptance capacity for mountain lions. Demographic variables did not affect risk perceptions of or acceptance

capacity for the crocodile. Males, younger persons, and those with lower incomes expressed more positive attitudes towards crocodiles.

This study provides initial insights into factors affecting risk perceptions of and acceptance capacity for the American crocodile in south Florida. Educational programs that teach appropriate behavior in the presence of crocodiles, address risks and benefits of crocodiles, increase knowledge of crocodiles, and reveal that south Florida residents, visitors, and experts perceive low risks from crocodiles will be most effective for increasing positive attitudes towards crocodiles. Individuals with favorable attitudes towards American crocodiles will more likely support measures to recover and protect this endangered species than those possessing negative attitudes (Hungerford and Volk 1990, Stern 2000). Education campaigns should be delivered not only to adults, but to children as well, since life-long attitudes and behaviors towards animals are largely based on childhood experiences (Kidd and Kidd 1985). Children must be better taught to value all life, especially wild animal life, if biodiversity is to be maintained and if endangered species are to be adequately protected (Kidd and Kidd 1996). An education campaign targeted at reducing risk perceptions of and increasing acceptance capacity for the American crocodile in south Florida needs to be designed, implemented, and assessed to better understand effects of communication and to further promote conservation and recovery of this endangered species.

APPENDIX A  
THE INFORMED CONSENT PROCESS USED FOR INDIVIDUALS  
PARTICIPATING IN THE PRELIMINARY INTERVIEWS.

Hello, my name is Jodie Smithem. I am a graduate student at the University of Florida working with Dr. Frank Mazzotti. We hope to understand public knowledge, attitudes, and perceptions of the American crocodile in South Florida through information obtained by participants filling out a questionnaire. To aid in the questionnaire development, preliminary interviews will be conducted. The interview takes approximately 10-15 minutes to complete. Your participation in this study is completely voluntary. There is no penalty for not participating. You have the right to withdraw from the study at any time without consequence. You do not have to answer any question you do not wish to answer. You will not be compensated for participating in this study and we do not anticipate that you will benefit or be harmed directly by participating in this study. Your identity will be kept completely confidential. We do not ask for your name at any time during the interview and, therefore, your name will not be associated with your responses. If you have any questions regarding the study, you may contact Dr. Frank Mazzotti at the Ft. Lauderdale Research and Education Center, 3205 College Avenue, Ft. Lauderdale, FL 33314, phone number 954-577-6304. If you have any questions or concerns about your rights as a research participant in the study, you may contact the University of Florida's Institutional Review Board at PO Box 112250, University of Florida, Gainesville, FL, 32611, phone number 352-392-0433. Would you like to participate in the study by being interviewed?

APPENDIX B  
THE INFORMED CONSENT PROCESS USED FOR INDIVIDUALS  
COMPLETING THE QUESTIONNAIRE.

Hello, my name is Jodie Smithem. I am a graduate student at the University of Florida working with Dr. Frank Mazzotti. We hope to understand public knowledge, attitudes, and perceptions of the American crocodile in South Florida through information obtained by participants filling out a questionnaire. The questionnaire takes approximately 15 minutes to complete. Your participation in this study is completely voluntary. There is no penalty for not participating. You have the right to withdraw from the study at any time without consequence. You do not have to answer any question you do not wish to answer. You will not be compensated for participating in this study and we do not anticipate that you will benefit or be harmed directly by participating in this study. Your identity will be kept completely confidential. We do not ask for your name anywhere on the questionnaire and, therefore, your name will not be associated with your responses. If you have any questions regarding the study, you may contact Dr. Frank Mazzotti at the address or phone number listed on the questionnaire. If you have any questions or concerns about your rights as a research participant in the study, you may contact the University of Florida's Institutional Review Board at the address or phone number listed on the questionnaire. Would you like to participate in the study by completing a questionnaire?

APPENDIX C  
THE SELF-ADMINISTERED QUESTIONNAIRE USED FOR INQUIRY INTO THE  
BELIEFS, ATTITUDES, RISK PERCEPTIONS, AND CROCODILE POPULATION  
PREFERENCES OF STAKEHOLDERS IN SOUTH FLORIDA BY JODIE L.  
SMITHEM FOR HER 2003-2004 MASTER'S THESIS.

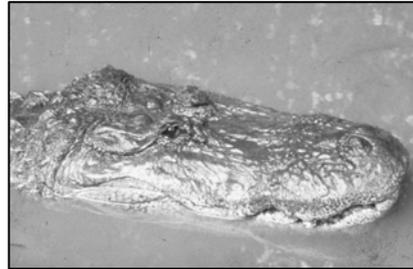
Interviewer \_\_\_\_\_  
Location \_\_\_\_\_  
Date \_\_\_\_\_

## **American Crocodiles in South Florida: A Survey of Your Views**



American crocodile

vs



American alligator

**Your responses will remain anonymous  
and will never be associated with your name.**

This questionnaire is part of a study to assist biologists and wildlife managers with making decisions about American crocodiles in south Florida. Your views are very important to us and will contribute to how American crocodile management and recovery efforts are conducted. The questionnaire should take approximately 15 minutes to complete.

**THANK YOU FOR YOUR ASSISTANCE!**

# **American Crocodiles in South Florida: A Survey of Your Views**

**This survey is conducted by:**

University of Florida  
School of Natural Resources and Environment  
103 Black Hall, PO Box 116455  
Gainesville, FL 32611

and

U.S. Fish and Wildlife Service  
South Florida Field Office  
1339 20<sup>th</sup> Street  
Vero Beach, FL 32960

## **Research Participant Rights**

If you have any questions regarding this survey, please write Frank J. Mazzotti, Associate Professor, University of Florida, Ft. Lauderdale Research and Education Center, 3205 College Avenue, Ft. Lauderdale, FL, 33314, or call him at 954-577-6304.

If you have any questions or concerns about your rights as a research participant in this study, please write the University of Florida's Institutional Review Board at PO Box 112250, University of Florida, Gainesville, FL, 32611, or call 352-392-0433.

**WILDLIFE AND YOU:**

**1. The following is a list of some activities that bring people into contact with wildlife. Please indicate which of the following activities you, or members of your household, participate in regularly. (Please check [✓] ALL statements that apply.)**

	Yourself	Others in your household
a. Bird watch .....	[ ]	[ ]
b. Read about wildlife .....	[ ]	[ ]
c. Watch wildlife TV programs, videos, or movies ....	[ ]	[ ]
d. Visit zoos or aquariums .....	[ ]	[ ]
e. Hike in south Florida natural areas .....	[ ]	[ ]
f. Bike in south Florida natural areas .....	[ ]	[ ]
g. Boat in south Florida natural areas .....	[ ]	[ ]
h. Observe or study wildlife outdoors .....	[ ]	[ ]
i. Work on a farm or ranch .....	[ ]	[ ]
j. Fish in south Florida natural areas.....	[ ]	[ ]
k. Other activities _____	[ ]	[ ]

**2. How much information about the American crocodile have you seen or heard during the last six months from each of the following? (Please circle a number for each source.)**

	Absolutely none			A great deal	
Newspapers or TV news stations?	1	2	3	4	5
The federal government?	1	2	3	4	5
State government?	1	2	3	4	5
Non-profit organizations?	1	2	3	4	5
The U.S. Fish and Wildlife Service?	1	2	3	4	5

**3. How much information about the American alligator have you seen or heard during the last six months from each of the following? (Please circle a number for each source.)**

	Absolutely none			A great deal	
Newspapers or TV news stations?	1	2	3	4	5
The federal government?	1	2	3	4	5
State government?	1	2	3	4	5
Non-profit organizations?	1	2	3	4	5
The U.S. Fish and Wildlife Service?	1	2	3	4	5

**4. If you wanted to learn more about the American crocodile, which of the following sources would you utilize to find information? (Please check [✓] ALL that apply.)**

- |                                     |     |                               |     |
|-------------------------------------|-----|-------------------------------|-----|
| Books, magazines, or journals ..... | [ ] | The internet .....            | [ ] |
| Newspaper articles .....            | [ ] | Government agencies .....     | [ ] |
| Wildlife TV programs .....          | [ ] | Non-profit organizations .... | [ ] |

**WILDLIFE KNOWLEDGE:**

**5. Before receiving this questionnaire, did you know that American crocodiles live in south Florida?**

- [ ] Yes  
[ ] No

**6. Please circle the answer that you believe is correct for each of the following questions.**

- A. The American crocodile is a federally-listed:
- endangered species
  - threatened species
  - neither endangered nor threatened species
- B. The American crocodile occurs in Florida and:
- Central America
  - Louisiana
  - Mississippi
  - all of the above
  - none of the above
- C. Generally, American crocodiles are \_\_\_\_\_ American alligators.
- more aggressive than
  - less aggressive than
  - just as aggressive as

D. Typically, American crocodiles are found in:

- a) the open ocean
- b) freshwater streams or lakes
- c) brackish or saltwater estuaries
- d) none of the above

E. Has there been a documented American crocodile attack on a human in south Florida?

- a) Yes
- b) No
- c) Don't Know

**CROCODILES AND YOU:**

**7. Please indicate which, if any, of the following types of interactions with American crocodiles you or members of your household have experienced.** *(Please check [✓] ALL that apply.)*

	Yourself	Others in your household
a. Observed a crocodile in the wild (i.e., anywhere other than captivity) .....	[ ]	[ ]
b. Read or heard of a crocodile being threatened or attacked by people .....	[ ]	[ ]
c. Had a pet threatened or attacked by a crocodile .....	[ ]	[ ]
d. Had livestock threatened or attacked by a crocodile .....	[ ]	[ ]
e. Have been personally threatened by a crocodile .....	[ ]	[ ]
f. Read or heard about pets being threatened or attacked by a crocodile .....	[ ]	[ ]
g. Observed, read, or heard about fish or crabs traps being raided by crocodiles .....	[ ]	[ ]
h. Read or heard about other people being threatened or attacked by a crocodile .....	[ ]	[ ]
i. Know a friend, neighbor, or family member who had an encounter with a crocodile .....	[ ]	[ ]
j. Read or heard about a crocodile being killed by an automobile .....	[ ]	[ ]
k. Other types of experiences: _____	[ ]	[ ]

**8. Encounters between American crocodiles and people carry some level of risk to people, pets, or livestock. The following questions are designed to help us better understand your opinions about crocodile-human encounters in south Florida.**

*On a scale from 1-to-5 please circle the number between the two words in **each** row that most closely represents your opinion. DK = Don't Know*

- a. Are encounters between American crocodiles and people a new event, or an old event that has been occurring for a long time in south Florida?

A new event      1      2      3      4      5      An old event      DK

- b. Are crocodile-human encounters increasing or decreasing in south Florida?

Increasing      1      2      3      4      5      Decreasing      DK

- c. To what extent do you believe that you are personally at risk from American crocodiles?

I am at no risk      1      2      3      4      5      I am at great risk      DK

- d. To what extent do you believe that American crocodiles pose a risk to communities?

Community is at no risk      1      2      3      4      5      Community is at great risk      DK

- e. Are the risks associated with American crocodiles something people will be able to learn to live with, or are the risks something people will be unable to learn to live with over time?

Able to learn to live with the risks      1      2      3      4      5      Unable to learn to live with the risks      DK

- f. Are the risks from American crocodiles generally accepted voluntarily – that is, can people make choices about being exposed to the risks – or are the risks accepted involuntarily?

Risks accepted voluntarily      1      2      3      4      5      Risks accepted involuntarily      DK

g. To what extent are the risks associated with having crocodiles in Florida understood by experts?

Not well understood                      1              2              3              4              5              Well understood                      DK

h. Are the people who benefit from American crocodiles the same people who are exposed to the potential risks of living with American crocodiles?

Benefits and risks are matched              1              2              3              4              5              Benefits and risks are mismatched                      DK

**9. For each of the following scenarios, please indicate if you believe relocating (i.e., moving) American crocodiles would be an acceptable or an unacceptable management tool.**

	Acceptable Tool	Unacceptable Tool	No Opinion
Crocodile is found on a golf course .....	[ ]	[ ]	[ ]
Crocodile is found on school property .....	[ ]	[ ]	[ ]
Crocodile is found in a swimming pool .....	[ ]	[ ]	[ ]
Crocodile is found where people boat .....	[ ]	[ ]	[ ]
Crocodile attacks and injures a pet .....	[ ]	[ ]	[ ]
Crocodile attacks and injures a human .....	[ ]	[ ]	[ ]
Crocodile attacks and kills a pet .....	[ ]	[ ]	[ ]
Crocodile attacks and kills a human .....	[ ]	[ ]	[ ]

**10. For each of the following scenarios, please indicate if you believe ethanizing (i.e., killing) American crocodiles would be an acceptable or an unacceptable management tool.**

	Acceptable Tool	Unacceptable Tool	No Opinion
Crocodile is found on a golf course .....	[ ]	[ ]	[ ]
Crocodile is found on school property .....	[ ]	[ ]	[ ]
Crocodile is found in a swimming pool .....	[ ]	[ ]	[ ]
Crocodile is found where people boat .....	[ ]	[ ]	[ ]
Crocodile attacks and injures a pet .....	[ ]	[ ]	[ ]
Crocodile attacks and injures a human .....	[ ]	[ ]	[ ]
Crocodile attacks and kills a pet .....	[ ]	[ ]	[ ]
Crocodile attacks and kills a human .....	[ ]	[ ]	[ ]

**11. People in Florida have many different opinions about American crocodiles. To what extent do you agree or disagree with each of the following statements? (Please circle the number that best represents your response to each statement.)**

1 = Disagree Strongly  
2 = Disagree

3 = Neither Agree nor Disagree  
4 = Agree

5 = Agree Strongly  
6 = No Opinion

	Disagree Strongly			Agree Strongly		No Opinion
a. The presence of crocodiles is a sign of a healthy environment .....	1	2	3	4	5	6
b. The presence of crocodiles <u>in Florida</u> increases my overall quality of life .....	1	2	3	4	5	6
c. The presence of crocodiles <u>near my home</u> increases my overall quality of life .....	1	2	3	4	5	6
d. The presence of crocodiles decreases property value .....	1	2	3	4	5	6
e. Crocodiles could benefit the local economy by being a tourism attraction ..	1	2	3	4	5	6
f. Crocodiles should have the right to exist wherever they may occur .....	1	2	3	4	5	6
g. Crocodiles are an unacceptable threat to humans and pets .....	1	2	3	4	5	6
h. I think the crocodile is a likable species .....	1	2	3	4	5	6
i. Crocodiles threaten people's livelihoods by raiding fish and crab traps .....	1	2	3	4	5	6

**12. This question is designed to help us better understand your perceptions about the possibility of you being attacked by an American crocodile while living in or visiting south Florida. Do you believe each of the following is more likely or less likely to occur to you than being attacked by an American crocodile in south Florida? (Please circle only *ONE* response for each item.)**

Example: A person was asked to indicate if she thought the possibility of getting struck by lightning was more or less likely to occur to her than being attacked by an American crocodile in south Florida. She thought the possibility of getting struck by lightning was more likely to occur to her than being attacked by an American crocodile, so she circled "More Likely."

<i>The possibility of...</i>		<i>...is...</i>		<i>...to occur to you than the possibility of being attacked by an American crocodile in south Florida.</i>
Getting into a car accident	More Likely	Less Likely	Unsure	
Getting injured if you work for a timber company	More Likely	Less Likely	Unsure	
Getting into an accident if you ride a motorcycle	More Likely	Less Likely	Unsure	
Being attacked by an alligator	More Likely	Less Likely	Unsure	
Having an accident if you drive a tractor	More Likely	Less Likely	Unsure	
Getting into a commercial airline crash	More Likely	Less Likely	Unsure	
Getting attacked by a shark	More Likely	Less Likely	Unsure	
Dying as a result of cancer	More Likely	Less Likely	Unsure	
Becoming a murder victim	More Likely	Less Likely	Unsure	

**CROCODILE POPULATIONS:**

Please answer the following questions based on your opinion.

**13. How has the American crocodile population in south Florida changed during the past five years?** *(Please check [✓] only ONE of the following statements.)*

- Decreased Greatly
- Decreased Somewhat
- Remained the Same
- Increased Somewhat
- Increased Greatly
- No Opinion

**14. Do you want the American crocodile population in south Florida to increase, decrease, or remain at its current level over the next five years?** *(Please check [✓] only ONE of the following statements.)*

- Decrease Greatly
- Decrease Somewhat
- Remain at its Current Level
- Increase Somewhat
- Increase Greatly
- No Opinion

**15. How important is it to you personally that the American crocodile population trend match your response to question 14?** *(Please check [✓] only ONE of the following statements.)*

- Very Unimportant
- Somewhat Unimportant
- Neither Important nor Unimportant
- Somewhat Important
- Very Important
- No Opinion



**24. Please indicate your household average income in 2003 before taxes.** (*Please check [✓] only ONE.*)

Under \$20,000

\$60,000 - \$99,999

\$20,000 - \$39,999

\$100,000 - \$500,000

\$40,000 - \$59,999

Over \$500,000

**25. What is your occupation?** \_\_\_\_\_

**26. What types of local organizations do you belong to?** (*Please check [✓] ALL that apply.*)

Civic or social (Example: Rotary Club)

Church or religious

Environmental (Example: Audubon Society)

School-based (Example: PTA)

**27. Please use the space below for any additional comments you wish to make regarding crocodiles or this survey.**

**THANK YOU FOR YOUR TIME AND HELP!**

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