

ABSTRACT

SENOR, BRYANNE LOUISE. A Park at their Doorstep: Understanding Local Residents' Use and Perception of Biscayne National Park. (Under the direction of Dr. Sarah T. Warren).

The purpose of this study was to investigate the relationship local visitors have with Biscayne National Park (BNP), located 28 miles south of the city of Miami, Florida. Biscayne National Park, as the largest marine national park in the country, contains 173,000 acres of mangrove shoreline, estuary, primitive limestone islands, and twenty miles of coral reef. Not only is it unique among US national parks for the marine resources it protects but also because Biscayne is heavily used by local residents of Miami-Dade County rather than typical out of town national park visitors. Presently, it appears that the majority of these visitors focus on picnicking, barbecue parties, and other group gatherings, making use of the mainland lawns and important island habitat. These trends indicate that BNP usage is not aligned with the park's mission or vision of low impact inquiry-based activities (e.g. reef snorkeling).

BNP is also in the process of revising its General Management Plan (GMP) for the first time in 27 years. Based on use observations, public GMP scoping that suggested the park work more in concert with local communities, and literature that supports increased local involvement in national park management, it was timely to investigate local visitor behavior and consequent resource stewardship needs.

Sixty semi-structured interviews were conducted in 2009 with local park visitors in order to evaluate quantitatively and qualitatively their use patterns, knowledge and value of BNP resources, and valuation of BNP recreation opportunities. Interview

findings support the observations of Park staff: local residents do not utilize the inquiry-based activities BNP offers as much as they visit BNP for relaxation and group gatherings. Local visitors however, did express appreciation for BNP, as a way to recreate and get away from their urban environment. They placed high importance values on park resources, but their knowledge of the park's resources was not consistent. These results of this examination of park use will help to inform Biscayne's GMP revisions and bring to light why local communities' perceptions are relevant in national park management.

A Park at their Doorstep: Understanding Local Residents' Use and Perceptions of
Biscayne National Park

by
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BIOGRAPHY

Bryanne has always felt a strong connection to and respect for the natural world, and through her undergraduate career in Parks, Recreation, and Tourism Management realized she could foster this connection in others. Bryanne's personal understanding of her relationship with nature and others has been deepened through the regular practice of yoga.

Upon graduating from North Carolina State University the first time, Bryanne worked for a brief but very enlightening time as a Park Ranger in environmental education at Biscayne National Park in south Florida. Bryanne used her Master's education to gain greater perspective and knowledge of (national) park management and local perceptions on natural resource. She also started sharing her love for yoga with others throughout this time by gaining her teaching certification and teaching yoga around Raleigh.

Teaching yoga full-time is Bryanne's goal after receiving her Master's degree; she would ultimately like to teach yoga in connection with environmental awareness and education. Just as it brought her to this point, however, she remains open to following any experiences that provide personal growth and speak to her heart.

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Chapter 1: National Parks in the United States

1.1 Introduction

A brief introduction to the National Park Service serves to set the context for research on one of the newer parks, Biscayne National Park (BNP). BNP stands among 58 national parks, established during the banner year of 1980.

The conflict and confusion surrounding the early establishment of National Parks in the United States has been well reviewed (Boyd & Butler, 2000; Everhart, 1983, Lovett, 1998; Rettie, 1995). In this chapter, focus is primarily on the seemingly contradictory nature of the NPS mission: preservation and public use. The role of local communities in national park planning and management will be discussed as a way to mitigate conflicts resulting from duality in the NPS mission.

1.1.1 US National Parks: A brief overview

The idea of designating unique natural areas as national parks originated in the United States (Boyd & Butler, 2000; Everhart, 1983). The first National Park (Yellowstone NP) was established in 1872. But it was only with the passage of the Organic Act of 1916 that a single agency was assigned administrative responsibilities. Under the Department of Interior's new National Park Service (NPS), various lands set aside as parks were united under a relatively weak mandate: to maintain public use and protect park resources (Everhart, 1983).

The National Park Service now operates 392 units, covering 84 million acres of land, 4.5 million acres of oceans and lakes, and 43,000 acres of shoreline in 49 states and 4 territories (O'Brien, 1999, Appendix III; USNPS, 2009). These protected lands include monuments, historic sites, seashores, drives, and archeological sites as well as National Parks (USNPA, 2009). A current map of the National Park System is attached as Appendix I. These US National Parks preserve areas of pristine, unique, indicator, and/or representative natural resources (USNPS, 2009).

1.1.2 Claiming the land of the National Parks

In many cases, communities residing on land chosen for national parks (as for national forests, and other public lands) have been alienated from the land in favor of public interests. For example, land set aside as a National Park on St. John in the US Virgin Islands was developed as a park for the *national* community. According to Olwig (2009) the Park Service basically removed the material and symbolic basis of the St. Johnian culture and daily activities. For establishment of the Great Smoky Mountains National Park, descendents of those who preserved American Appalachian culture were removed from their land. Williams (2002) argues that their culture is now not even preserved as part of park history.

Hunn et al. (2003) describe a different type of alienation, where the Huna Tlingit tribe's access to Glacier Bay NP, Alaska, was initially prevented. Only after traditional egg collection behaviors were deemed sustainable by the NPS were they allowed to continue their harvests.

1.1.3 Symbolic and concrete values of National Parks

Despite insensitivities toward some traditional communities, US National Parks are perceived as a symbol of pride to the world (Runte, 2002; Lovett 1998). Yellowstone NP was partly established to act as a symbol of the American spirit (Rettie, 1995). Historian James Bryce declared in 1912, that National Parks were “America’s Best Idea” (Gomez, 2007; Pitcaithley, 2007). National Parks exist as part of a larger ecosystem and national community; they have become symbols of American pride that reinforce the country’s national identity (Lovett 1998).

The public values parks for their capacity to build community—through open spaces, forums for bonding (interaction, leisure), exposure to and encouragement of cultural diversity, and as a way to transmit values that the United States would like to represent (i.e. culture, nature, solitude, etc.). Also among these values is a perception of environmental stewardship and conservation (Lovett 1998). These varied values and uses by individuals result in a high level of public popularity. Though the mission of the Park Service upholds these individual uses, parks also have value due to the other side of their twofold mission: to protect resources for future enjoyment.

1.2 NPS Mission: Inherent Tensions

According to the Organic Act, the mission of the National Park Service (NPS) is "...to promote and regulate the use of the...national parks...which purpose is to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."

A mission that includes both public use and preservation presents inherent challenges for the NPS (Dearden, 2000; Everhart, 1983). Because the national parks exist to maintain natural ecosystems and genetic, behavioral, evolutionary, and physical processes **and** to provide recreation for visitors, the NPS is in constant internal and external dialogue over balancing these dual missions (Dilsaver, 1994). And indeed, the wording of the Organic Act of 1916 confirms this dual mandate—conservation of park resources in addition to providing enjoyment for the public (Boyd & Butler, 2000; Fridley et al., 1972). Further confounding the mission is the concept that although managed by a federal agency, the National Parks are owned by the American people (Manning & More, 2002).

At their greatest, America's National Parks uphold the hope of preserving natural order and as historical parks they act as the nation's memorials (Runte, 2002). The other major influence upon the creation of national parks is directly related to tourism and recreation (Boyd & Butler, 2000). While national park resources are undoubtedly to be conserved, they also exist to "provide for the enjoyment" of people.

Recreation, therefore, in its many forms, is integral to National Parks (Manning & More, 2002). Through years of multiple park visitor surveys, an array of benefits and values in the form of recreation for the park visitor has been discovered. Because the public benefits of National Parks include a cluster of recreational, aesthetic, educational, economic, intellectual, and ethical values as well as “inherent” ecological values (Manning & More, 2002; Penfold et al., 1972), tensions invariably arise in park management.

1.3 External and Internal Influences on Management of Diverse Communities and Ecosystems

National parks experience external and internal pressures that threaten the unique natural resources within the parks (Mitchell, 2006; Warren, 2006). For example, development encroaches upon park boundaries; there have been severe cuts in funding; and visitor behavior often conflicts with park mission (Cox, 2000). According to Arrandale (2006) and Warren (2006), the major threat to the quality and environmental objectives of national parks is detrimental visitor behavior. Both external development and internal overuse/misuse within park boundaries contribute to air and water pollution, erosion, degradation of soil, loss of plants and wildlife habitat, and human-wildlife conflicts (Arrandale 2006, Dilsaver 1994; Everhart, 1983).

1.3.1 External pressures

National Parks struggle with external resource management challenges that revolve around boundary communities and the fact that these parks exist within a larger ecosystems (Lovett, 1998). In Yellowstone NP, the re-introduction of wolves was controversial within the park but also received a great deal of backlash from people outside. Ranchers living on the outskirts of Yellowstone feel their livelihoods are being threatened; the Yellowstone wolves often venture outside of the park to feed on livestock, endangering the ranchers' income and lives (Lovett, 1998). This issue has still not completely been resolved; as wolf populations continue to increase (as called for by the park's management plan), the NPS and its partner NGOs have attempted to remedy the situation by compensating the ranchers monetarily.

The everglades ecosystem historically covered the lower portion of Florida but much of that fresh water has now been rerouted to irrigation channels and levees for use by Florida residents. In response to economic interests, this shift in water has drastically altered the natural ecosystem for agriculture and development (Lovett, 1998). These short-term interests resulted in unchecked growth; Everglades National Park would have also been drained and built upon if the federal government had not established it. Despite this protection, alteration of the surrounding ecosystem has endangered species with the park, changed water levels, altered flow rates, encouraged invasive plants, and increased pollution from agricultural runoff (Lovett, 1998).

Over the past ten years, the NPS along with other agencies in south Florida have been developing a Comprehensive Everglades Restoration Plan (CERP) in order to address these environmental and economic issues. The plan calls for a restoration of the everglades to its historical flow, as current development allows. Through revising the management plan, the NPS can answer needs of the ecosystem while using public input to guide their decisions.

1.3.2 Internal pressures

The majority of national parks face increasing visitation levels at peak times of year which have been putting pressure on the resources, causing air pollution, noise pollution, wildlife injuries, and other environmental degradation. Other inappropriate visitor uses of parks also cause conflict with environmental conservation. The Park Service is constantly determining how best to regulate use in order to conserve resources while still providing for common interests (Dilsaver, 1994).

One heated and publicized case was whether to allow the use of snowmobiles in Yellowstone National Park in Wyoming (Lovett 1998). Many user groups felt it was their right as taxpayers and stakeholders of the parks to use them as they desired which meant snowmobiling during important wildlife migration season. After much public input and debate, the Park Service is still in the decision process. Currently, snowmobile use is restricted as to where and how many can be driven in a day. Many still believe this to be unfair, while other groups think the NPS should completely prohibit snowmobile use because they are too much of a threat to the ecosystem, as well as the enjoyment of other visitors.

A similar example rests in the management of bear and visitor interactions. There are many cases of bear/human conflict that put both the human and the bear in danger (Lovett, 1998). Park visitors often do not obey the regulations for bear interactions (i.e. not feeding, locking up food, and keeping their distance), resulting in harm, death, or improper behavior of wildlife. These cases illustrate the lack of responsibility many visitors exhibit to the resources, even though, technically, it is *their* resource. In a way, Lovett (1998) and others' examples suggest that the majority of individual users would feed their short-term needs rather than the long-term community and ecosystem needs that the NPS works to protect while providing opportunities for visitor use.

Preserving these park ecosystems also results in a difference of opinion in park management between community interests and needs. These conflicts surface when boundary communities feel they are being oppressed (Lovett, 1998). For example, when hydroelectric dams were to be built directly outside Zion National Park in Utah, a divide between the electric company and its customers and the NPS and its supporters was created. Cases such as these are present in many parks within the US, when new parks are created, boundaries are expanded, or parks are protected from outside environmental pressures (Lovett, 1998; Warren, 2006).

The conflict between current and future generations also exists within internal management of resources. As mentioned before, "overuse" of parks appears to be occurring from visitation exceeding the capacity of parks such as Yosemite (Lovett, 1998).

More than half of all National Park visits are to only 15 percent of the NPS units. The NPS is challenged with determining whether to reduce the number of visitors and restrict access to what is technically their resource (Lovett 1998). There have been suggestions to develop more facilities to accommodate the increase in the public, but this could further degrade the environment. Placing restrictions on visitation is another suggestion to protect resources but could offend the public. There has already been public outcry against visitation restrictions and increasing prices, so the NPS works continuously to strike a balance between resource and visitor needs (Lovett, 1998).

1.4 Evolution of the NPS Planning and Management Model

To accomplish its mission, the NPS has been organized along 10 guiding principles. The third principle, “providing opportunities for citizens to participate in the decisions and actions of the National Park Service”, is at the center of this research study. The conflicts inherent in the dual mission are somewhat assuaged by the recent evolution of park planning, so that these “Parks of the people” can be managed in part by the people, including them in the planning process (Runte, 2002).

1.4.1 Historical precedents

Though the National Park idea was controversial and contested, more and more national parks were established in the years following Yellowstone (Everhart, 1983). The main driving force behind the national park “movement” was public outcry.

In 1906, spurred by increased public support for National Parks, the Antiquities Act was passed that allowed the president to establish National Monuments without approval of Congress (Everhart, 1983). This act resulted in the establishment of an unprecedented number of national monuments, the majority of which would eventually be designated as parks.

Public support and ownership of national parks was well established, but before the passage of the National Environmental Protection Act (NEPA) in 1970 park planning was done behind closed doors by park management only. The present system requires public involvement and community participation (Eagles and McCool, 2002; Foresta, 1984).

However, there is no public planning process for the entire National Park system. Thus, individual National Parks must complete and implement a *General Management Plan* (GMP). These GMP's comprise the park's purpose and management objectives, proposed zoning for areas within the park, and interrelated proposals for resource management, interpretation to visitors, and general development. The public is then invited to choose between the proposed zoning options and alternative regulations (McCurdy, 1985).

1.4.2 Current planning and management goals and objectives

NEPA provides for public involvement in the form of scoping meetings. Public opinion is sought when there is potential for a park's GMP to be altered. Parks collaborate with the public through a series of scoping events (meetings, online, mail, or phone) to determine the best strategy for resource management use.

Such scoping events often result in compromises between the intentions of management and park users (Everhart, 1983).

1.4.3 Inherent problems in planning and management

The NPS seeks balance between its twofold mission through this management model. Public opinion is included when there is potential for a park's General Management Plan (GMP) to be revised. Park planning, however, is a dynamic and complex process. Park managers set the regulations and policies within their GMPs but the public are included to fine tune management plan revisions. The required public scoping and input gathering only occurs during GMP revisions, which can be every five to twenty years. Clearly, not all voices and opinions can be addressed, but involving key stakeholders is seen as an essential strategy for a suitable outcome (Eagles & McCool, 2002; Foresta, 1984).

1.5 Local Communities and Park Planning

Not only can national parks have a great impact on traditional communities and cultures, but in the relationship between the two, adjacent communities and park visitors also affect the management of parks. Current research suggests mitigating external and internal pressures, as well as responding to the NPS management model, through greater inclusion of and collaboration with the local public (National Parks Conservation Association, 1988; Olwig, 2009).

The surrounding communities of National Parks are being recognized as key players in the management of parks, especially as tourists “infiltrate” these spaces more and more—and rather than creating a shared sense of history and culture, diminish it (Olwig, 2009). Through increased inclusion of local neighbors, a sense of understanding, pride, appreciation, and stewardship can be built. This inclusion also supports the idea that “National Park boundaries should, whenever possible, include entire ecosystems and surrounding areas...it be must recognized that parks cannot be preserved in a vacuum” (Penfold et al., 1972).

1.5.1 The case for local communities

National Parks have tremendous impacts on adjacent local communities, both negative and positive. They draw tourists to communities and provide recreation opportunities for local residents. At the same time, local community demands on park resources as well as on park-related development can have a profound effect on parks (NPCA, 1988). National parks, though they are a common resource, are part of a larger ecosystem and public community that is influenced by economic, social, and environmental factors. They are also managed on a longer time scale; they need to be managed for long-term goals while fulfilling the short-term needs of the public.

Some public land managers have taken the position that management decisions could appropriately be made without seeking input from the public, except to satisfy public review process requirements. However, the last few decades of U.S. history have made the public less confident that the government is representing their interests effectively.

Managers sometimes are viewed by the local community as anonymous bureaucrats implementing policies made a world away. As a result, the local community and the on-site park managers feel they have little direct influence over park policies. Park managers are seen as being less directly accountable to the public. This lack of local involvement often results in failure to build a positive relationship between the protected area and the local constituency (Barr, 2001).

In a report released by the National Parks Conservation Association titled “Five ways America can fix our national parks” (2006), increased community engagement and participation is highly recommended. One of the National Park Service’s long-term objectives states: “...to strengthen mutual understanding and cooperation between parks and neighboring communities” (McCurdy, 1985). The NPS constantly seeks a balance between federal management priorities while including the local public (Lovett, 1998).

In order to create a more symbiotic relationship between tourism, national parks, and local communities, more interactive and adaptive management approaches are suggested. These planning strategies have been shown to foster support for park and conservation activities (Nepal, 2000; Schwartz, 1997). Working with the local public through stakeholder meetings and smaller-scale planning has also enhanced management capabilities of parks while benefiting locals (Boyd & Butler, 2000).

National Parks can build a sense of ownership among citizens and instill a stewardship ethic by involving local communities continuously in planning.

In addition to community stewardship, park managers can influence the management of surrounding environmental and cultural resources—ideally through a framework for collaborative decision-making. By working collaboratively, citizens, stakeholders, and local leaders can define important resources, shared assets, and mutual values of the area (Cook et al., 2006).

1.5.2 Examples of local collaboration strategies

Park planning must be mindful of the relationship between national parks the communities that are located immediately adjacent to them. In North America, as in other regions of the world, conservation strategies are becoming more inclusive, recognizing multiple values, encompassing the interests of local communities and indigenous peoples, and relying on collaborative management approaches that involve diverse stakeholders (Nepal, 1995). Community involvement and inclusive approaches to conservation are central to an emerging new paradigm for protected areas worldwide, viewing these areas as community assets rather than purely national symbols. Protected area management is becoming more attuned to local people's needs—planning for, with and by locals.

To engage key stakeholders in developing a recreation management plan for Abaco National Park (ANP) in the Bahamas, researchers conducted a series of stakeholder mapping activities (Eadens, et al., 2009). The study focused on how local communities can and should be incorporated into park planning.

Because communities that border protected areas often have historic relationships with the area that can be overlooked when management decisions are made, a more integrated approach to conservation as well as recreation opportunities was sought in the study.

Through understanding how community members utilize resources of ANP and participate in the park's recreation opportunities, ANP was able to manage for the resource, such as an endangered parrot species, as well as the visitor. The authors suggest that such local inclusion activities can foster concern for resources and understanding of park issues.

A study in St. Lucia examined the factors that influence local community residents' support for the Pitons Management Area (PMA) as a World Heritage Site (Nicholas et al., 2009). In the past, developments in PMA have been disjointed with little involvement of the communities in the vicinity of the site. The researchers recognized that such development cannot occur without support from the local community. As the authors hypothesized, perception of PMA had direct impacts on level of support for PMA. Community attachment also had a direct positive effect on support for PMA. They found that environmental attitudes had a positive impact on perception of PMA. The respondents' also described a lack of faith in their ability to be actively involved in park planning. Based on these findings, the authors suggest that there is a need to include communities in park planning and enhance local capacity to participate in new policies for long-term park and community sustainability.

1.5.3 NPS and public planning: A local approach

As the original idea for land preservation coupled with recreation, US National Parks were historically managed through a federal “top-down” approach; as discussed this can exclude local participation and support for parks. As public institutions, management has recognized national parks’ roles in society and more recently in local communities. Park management also realizes they cannot be successful and coexist in the long-term with communities that are antagonistic toward them, nor can the local public fully benefit from the park through such tense relationships.

Park policies themselves are influenced directly by the political interests of local communities. However, at some times national policies may diverge from the interests of the local community, which is why park planning increasingly looks to the local community to find a compromise between the desires of management and needs of the locals (Eagles and McCool, 2002).

Some in the NPS now view scoping regulations as a way simply to fulfill a requirement while appearing to include public input in planning but actually acting as a forum to push park management’s agenda. Scoping can assume too much about what communities think and want, or disregard it completely (Leong et al., 2009). In a way, scoping makes the public choose sides—for or against management. Therefore, less formal processes are integral in working towards the goal of community collaboration in national parks: to see how communities can help the park and how the park can help communities.

One model of community engagement in US national parks arises from a study undertaken at Yosemite National Park (YNP) (Lever and Gilles, 2008). It raises important questions about the effectiveness of the NEPA regulated public scoping in order to include the public in planning. The authors sought community-building, which is very different from the “one-way public outreach to communities” attribute of mandated planning processes. Because the main model for community inclusion in NPS planning is a boiler-plate system set up by NEPA, not many other strategies exist. The recent YNP research responds to a widespread desire in the NPS for parks to not just meet NEPA regulations, but to reach beyond them (Lever and Gilles, 2008). This included a concerted effort throughout YNP to be open to the public on a regular basis and offer contact with personnel when requested. Specific suggestions based on the program at YNP include: appointing a community liaison, holding monthly planning open houses to keep community members involved in management decisions, and encouraging park employees to participate in civic associations and community organizations.

Overall, the results of these initiatives at YNP were considered successful. Positive and reciprocal relationships between park management and local residents are being built. Aggression and dislike toward the NPS has been reduced and communities have developed a level of trust for management. However, there is still some mistrust and negativity in the communities surrounding YNP. Years of anger at the insular park management customs and an ineffectual and bureaucratic planning process are hard to overcome.

1.5.4 Opportunities for balancing local use and national park management priorities

Based on the cited studies of successful inclusion of local residents in national park planning and previous discussion of internal and external management challenges, there are six main opportunities national parks have to balance often conflicting local use and perspectives with management priorities. Figure 1.1 illustrates these opportunities, they are: (1) use regulations and zoning, (2) “bottom-up” management, (3) market inquiry-based activities, (4) incorporation of cultural differences and use preferences, (5) reaching out to certain marginalized populations, (6) community-building and collaboration. The constraints to these opportunities will be discussed in further detail and within the context of Biscayne National Park in chapter 5.



Figure 1.1. A model of six main opportunities for how US National Parks might balance local use with park management priorities.

Regulating park use and zoning areas within parks by use is a common management strategy for national parks to balance use and resource protection (Everhart, 1983). This opportunity can diminish internal use conflicts such as snowmobile use and poor visitor use of resources (Lovett, 1998).

Modifications in use regulations and zoning often occur during GMP revisions during which time public input is called for. In this way, local perspectives may be incorporated into national priorities of resource protection.

Increasing local inclusion in management has been successful in other countries through “bottom-up” decision-making and employing local community members. This management opportunity invests the local community in the park and fosters resource stewardship. There are reports of successful community-based conservation efforts in parks where locals receive the bulk of benefits, either in biomass or profit (Reigl, et al., 2009).

Promoting the use of national park resources through inquiry-based activities (e.g., Ranger-guided programs, hiking, camping, etc.) can increase resource stewardship by local communities. This opportunity can speak to the objectives of park management by also providing recreation and use for the community.

National park management could work to understand how cultural differences influence local use and possibly accommodate differing use preferences. Specifically, urban parks provide diverse opportunities for recreation, leisure, and cultural activities (Sasidharan et al., 2006). Recent trends indicate that urban park usage is growing in popularity among ethnic and minority groups that once under-participated in outdoor recreation. Members of these ethnic groups tend to visit parks in larger social groups than the traditional white recreationists.

Social activities are also understood to be motivation for visiting urban parks, with picnicking and recreating with children as preferred activities (Sasidharan et al., 2006). Facilities and resources could be incorporated to accommodate these use preferences if it would also meet priorities of management.

Not all members of the local community can be included in park use. To gain the support and trust of a community as a whole and to increase benefits to a community, park management can reach out to certain marginalized populations (e.g., certain ages, races, and income classes). Managers could add to and diversify their publicity, outreach, and access in order to reach a wider variety of the local public (Byrne et al., 2009).

Lastly, long-term community-building can foster a reciprocal relationship between park management and its community (Lever and Gilliss, 2008). Reaching beyond the NEPA regulations in this way can also improve support for a park, increase resource stewardship, and work to address the five other opportunities (Fig. 1.1). Community-building programs expand on the public scoping required by the National Environmental Protection Act (NEPA) because they continuously gather local input to make decisions collaboratively rather than just gain support for closed-door management decisions made prior to interacting with locals.

Creating lasting relationships of local collaboration and not just episodes like scoping meetings is also important to build a sustainable and reciprocal relationship between park and local community (Leong et al., 2009).

Despite the studies described above, there is a lack of consistent and comparable information about *local* visitor usage in US National Parks. This results in potential misunderstandings about trends and changes in local usage and perceptions of national parks. Targeted research on community use, knowledge, and awareness of park attributes will clarify the relationship between national parks and their local communities.

Chapter 2: Biscayne National Park

2.1 Introduction

Biscayne National Park (BNP) is rare example of a locally used national park, but still represents many of the internal and external pressures that national parks throughout the US face. This chapter will describe how BNP is similar to US national parks and the unique attributes that set BNP apart. Subsequently, the management of BNP in regards to these attributes will be discussed, as well as how BNP and its local community fit into the NPS management model.

2.2 Overview of Biscayne National Park

Biscayne National Park (BNP) in Homestead, Florida (Fig. 2.1) is a highly locally used National Park, in contrast to the majority of National Parks across the US which are typically visited heavily by non-locals (Everhart, 1983). A visitor use survey conducted in 2001 revealed that 80% of all visitors to BNP are from Florida (University of Idaho Park Studies, 2001). Biscayne is not a typical National Park in other ways as well; BNP is not considered a “crown jewel” park like Yellowstone, Yosemite, and even the neighboring Everglades (Everhart, 1983). It was established only in 1980, along with eight other National Parks. Located 28 miles south of metropolitan Miami, its urban location is another exceptional factor. BNP is also surrounded by industrial development on all sides—a landfill, nuclear power plant, Air Force base, race track, and agricultural fields.



Figure 2.1. Map of South Florida highlighting the location of Biscayne National Park (USNPS, 2006).

2.2.1 Marine Protected Area status

Another exception from typical parks is that BNP is 95% water. This makes regulating access to and influences on its marine resources complex (Biscayne National Park, 1983). BNP is also a Marine Protected Area (MPA);

“any area of the marine environment that has been reserved by federal, state, territorial, tribal, or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources therein” (National Marine Protected Areas Center, 2008).

MPAs worldwide exist to mitigate damage occurring in oceans (National Marine Protected Areas Center, 2008). The use and activities within the designated marine ecosystem are regulated, and the marine resources are monitored according to the type of MPA an area is.

The level of use and protection also depends on the objectives of the agency managing an MPA.

MPAs are designated to achieve a large array of conservation objectives, from conservation of biodiversity, to preservation of historic sunken ships, to protection of commercial and recreational fisheries (National Marine Protected Areas Center, 2008). Therefore, the level of protection provided by these MPAs ranges from fully protected or “no-take” marine reserves to sites allowing multiple uses, including fishing, recreational, and industrial uses.

BNP is considered an area of “sustainable production”. It falls in the middle of the spectrums both of use and protection (National Marine Protected Areas Center, 2008). As a federally managed National Park, BNP exists to conserve resources as well as provide for the use and enjoyment of the public. BNP does not currently have any no-take zones; the waters of the park are open to recreational and commercial fishing. Specific fishing regulations set by the state of Florida are then enforced within BNP.

BNP’s role as a Marine Protected Area is guided by its status as a National Park. BNP does not provide as much protection of marine resources as other MPAs throughout the world (National Marine Protected Areas Center, 2008). However, certain recreation uses are prohibited, such as jet skis, and BNP staff monitors park resources regularly.

2.2.2 Natural resources

As the largest marine park in the National Park System, Biscayne's 173,000 acres encompass an undeveloped mangrove shoreline which stretches out into the Biscayne Bay estuary (Fig. 2.2). It extends to a chain of undeveloped, primitive limestone keys (Fig. 2.3) (the northern-most of a chain of coral keys in Florida). Twenty miles of submerged coral reef lies under the open ocean portion of BNP (USNPS, 2006). These ecosystems provide experiences for visitors in the form of snorkeling, diving, boating, swimming, fishing, picnicking, and more.



Figure 2.2. Portion of Biscayne Bay and the shoreline of BNP lined with mangrove trees (By author, 2009).



Figure 2.3. Aerial photo of chain of primitive keys (islands)BNP protects (BNP).

The ecosystem in which BNP exists includes Biscayne Bay, a 428-square-mile subtropical estuary. The bay began forming between 5,000 and 3,000 years ago as sea level rose and southern Florida was flooded. Throughout most of its history, the pristine waters of Biscayne Bay supported abundant and diverse fauna and flora. The bay also acts as a nursery for the adjacent coral-reef and marine ecosystems. In fact, BNP protects the northern portion of the third largest continuous reef in the world (Fig. 2.4).



Figure 2.4. Coral head within one of BNP’s many coral reefs (BNP).

2.2.3 Cultural resources

BNP also preserves the rich cultural history and resources of southern Florida, which includes American Indian tribes, pirates, pioneers, and more (USNPS, 2006; Biscayne National Park, 1983). Below Biscayne Bay lies a veritable “ship graveyard”. Shipwrecks from multiple centuries provide information on previous Florida residents and explorers as well as a chance for snorkelers and divers to see wrecked ships first-hand (Fig. 2.5).



Figure 2.5. Volunteers help to uncover and document a shipwreck within BNP (BNP, 2002).

The keys within BNP, though left undeveloped, were once inhabited. They preserve the culture of south Florida. The Honeywell family, instrumental in developing much of south Florida, owned Boca Chita key (Fig. 2.6) and families of pioneers utilized the keys and water of what is now BNP as well. Before spongers and pineapple farmers arrived, Tequesta Indian tribes and other native peoples claimed areas of BNP as home and have left evidence of their existence (USNPS, 2006).



Figure 2.6. Boca Chita lighthouse on Boca Chita Key within BNP. This site holds historic and cultural values for South Florida (By author, 2009).

2.3 Establishment of Biscayne National Park¹

Biscayne has a checkered past. Its establishment was contentious due to industry pressures, but in the end it is a story of how a small group of dedicated local citizens supported BNP for both conservation and community needs.

2.3.1 Development pressures

During the early 1950s, an increasing number of Americans were taking vacations and moving to Florida due to an increase in wealth and opportunity. The Florida Keys were a popular destination and property values skyrocketed.

¹ The history recorded here may not be completely unbiased; the majority of it comes from BNP's own records and perspective. Public records of BNP's establishment were also included in this history but the majority of it was also from a pro-park establishment perspective.

Many people looked at the northernmost undeveloped Keys and envisioned bridges, roads and buildings. Several years later came a plan to dredge 8,000 acres of bay bottom to create a small airport. In 1961, thirteen area landowners voted unanimously to create the City of Islandia. Plans for Seadade, a major industrial seaport, were soon after announced. The proposal called for the dredging of a 40-foot deep channel through the Bay's clear, shallow estuary waters (USNPS, 2006).

2.3.2 Local community involvement

An initially small, but vocal, group of local residents had an entirely different vision for these islands and the surrounding bay. They saw a national park unlike any other, covered by water and protecting not only the islands but the bay and the coral reefs. It would provide a refuge for wildlife as well as for people confined to city life. The park's proponents were not extraordinary in the usual sense of the word. They were doctors and pilots, farmers and writers. They were “average” local people who knew the area and who understood new concepts like ecology and environmental preservation (USNPS, 2006; Negrete, 2008).

And so the battle over what would be Biscayne National Park began. Neither side would back down and controversy escalated. Lloyd Miller, president of the local Izaak Walton League, became a key player in building public support for BNP. Journalist Juanita Greene's inspiring newspaper stories in the *Miami Herald* were a catalyst to the movement. Hardy Matheson based his entire campaign for county commissioner on the issue of establishing the national park.

Vacuum cleaner tycoon Herbert W. Hoover, Jr., who spent his formative years in the area, brought legislators from Washington for memorable blimp rides over the proposed park. By early 1968, local and national support for a Biscayne National Monument was at an all-time high.

2.3.3 Biscayne National Monument

Not prepared to give up despite public opposition, landowners in the city of Islandia brought in bulldozers in an attempt to desecrate the area. Referred to as "Spite Highway," their claim to the land was a six lane wide and seven mile long dirt road right down the middle of the longest key, Elliott Key.

Local park proponents still did not lose heart. Congress, led by longtime Representative Dante Fascell, created Biscayne National Monument to protect "a rare combination of terrestrial, marine and amphibious life in a tropical setting of great natural beauty." President Lyndon B. Johnson signed the bill in 1968 and in 1980 Biscayne became a National Park (USNPS, 2006) (Fig. 2.7).

2.3.4 Biscayne National Park

After more than a decade, Biscayne National Park was established in order to afford the area greater, and permanent, protection from industrial development. National Monuments can be altered or undesignated throughout presidencies, just as easily as they can be established. Once approved by Congress, however, National Parks can only be enlarged and designated as such permanently.

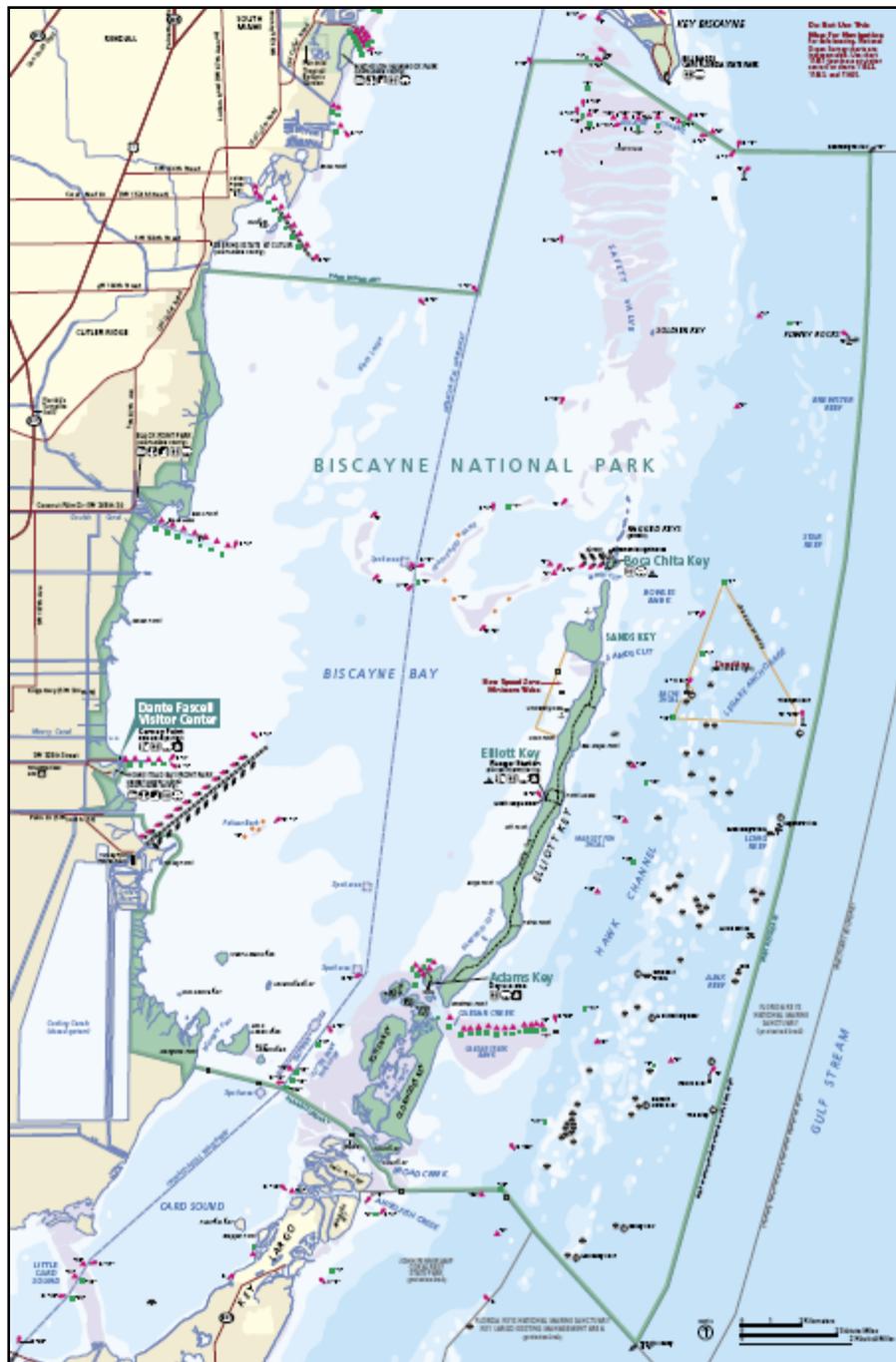


Figure 2.7. Map of Biscayne National Park (USNPS, 2006).

2.4 Current External Pressures on BNP

2.4.1 Development in South Florida

BNP has many unique attributes but also represents many of the external pressures national parks throughout the country face. Much has changed within and around Biscayne in the forty years since its establishment, including the park's surrounding community, growth in population, new technology, altered land use, diverse demographics, and changing visitor preferences (National Parks Conservation Association, 2008). While the effort to protect Biscayne from current local threats continues, some things have not changed. BNP is still a haven for wildlife and a respite for urban dwellers (Ault et al., 2001; USNPS, 2006).

2.4.1.1 Population growth and urbanization

Since the establishment of Biscayne as a national monument in 1968, urban population growth in Miami-Dade County has profoundly affected the environment of the park. Construction of power plants, water-treatment plants, solid-waste sites, and large-scale development along the shoreline significantly stress the ecosystem (South Florida Water Management District, 2004). BNP is surrounded on all sides by products of development—Miami (Fig. 2.8), a landfill, agricultural fields, and a nuclear power plant (Fig. 2.9).



Figure 2.8. Photo of Biscayne Bay within BNP and the adjacent metropolitan city of Miami, FL (Author, 2009).



Figure 2.9. Turkey Point nuclear and coal-burning power plant that borders BNP (Author, 2009).

Greater Miami has become a metropolis, with nearly 2.5 million residents and over eight million visitors annually from all over the world. Explosive regional population growth and documented resource declines have raised concerns about the future of the marine resources within and around BNP (Ault et al., 2001).

2.4.1.2 Industrial and agricultural development impacts

Agriculture represents a major land use in south Florida. Pesticide use presents a great potential risk to aquatic organisms (Fig. 2.10). Based on a hazard ranking of pesticides by the National Oceanic and Atmospheric Administration (NOAA), the top three estuarine drainage areas at risk in the U.S. were in Florida—Rookery Bay, Biscayne Bay, and Tampa Bay (Carriger & Rand, 2008).

In the 20th century, urbanization of the Miami-Dade County area profoundly affected the environment of the bay (South Florida Water Management District, 2004; Porter, 1999). Multiple stressors including water management, flow changes, and the creation of canals continue to alter salinity and temperature levels in the Bay. These fluctuations and incremental changes from outside forces threaten sensitive plant and animal life throughout BNP, including the coral reefs (Porter, 1999).

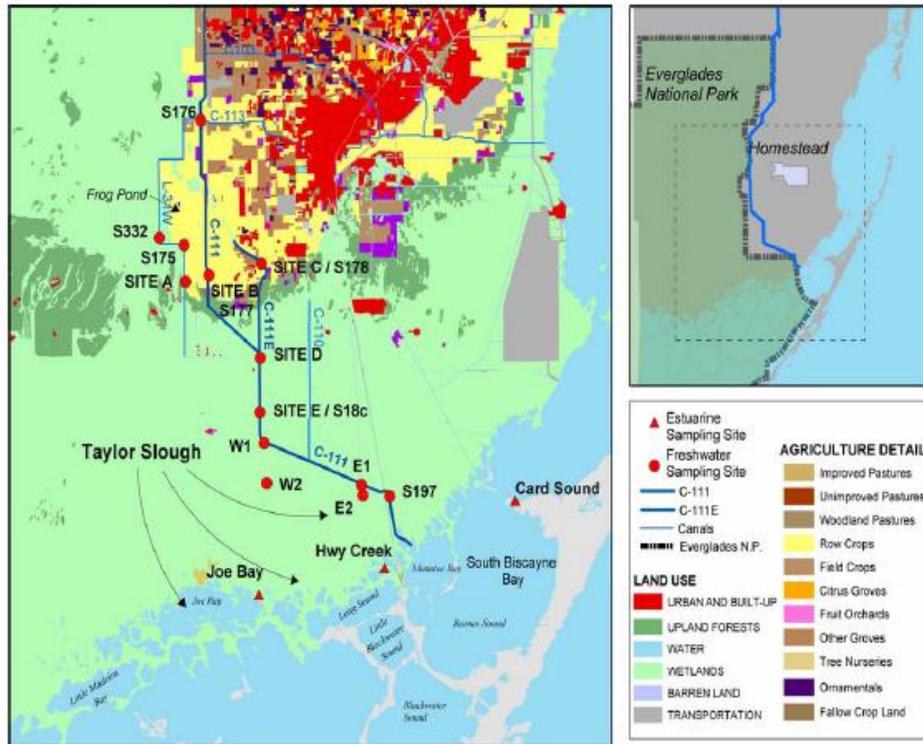


Figure 2.10. Map of primary land uses and drainage canals in southeast FL, surrounding Biscayne National Park (South Florida Water Management District, 2004).

2.4.2 Changes in water quality

Over the last eight decades, the Florida Keys, Florida Bay and Biscayne Bay have undergone dramatic changes in environmental conditions due to human alteration of the natural hydrology in southern Florida (Ault, 2001). Water quality in general, a major issue for all of southern Florida, has degraded in the past decades. Harmful contaminants such as phosphorus, pesticides, and metals from agriculture and urban runoff have been documented in high quantities.

Evidence that changes in surface, groundwater and water quality have adversely affected plant and animal species and habitats includes: declining wading bird populations, spread of invasive species, declines in commercial and recreational fisheries in Biscayne and Florida Bays, and sediment that may present potential adverse effects and risks to organisms (Rand et al., 2008). Habitats of fish and shellfish in the Florida Keys ecosystem, particularly those located in near-shore areas, have also been compromised by human activities.

2.4.3 Marine Protected Area management

From its inception, in addition to external development and water quality issues, BNP has been challenged with other specific marine management issues. As a Marine Protected Area (MPA), Biscayne is set apart from other national parks. Unlike the land, marine waters are already owned in the name of the public, so their protection and use is often more contentious.

US MPAs are designated and managed at all levels of government by a variety of federal, state, and local agencies (National Marine Protected Areas Center, 2008). As stated previously, there are many different types of MPAs depending on what they are designated to protect (e.g., cultural, natural, heritage, and more). The structure of MPA management allows for episodes of public input but not necessarily a local voice. The local public may be more dependent on marine parks for social and economic reasons. In return, they impact these places more than non-locals and more often (Eagles & McCool, 2002).

In areas such as BNP, public involvement in the designation of these zones is obtained through a public comment period when the areas are first proposed; changes to the management also require public comment. While government initiatives are created to act on behalf of the public in managing these areas, the public must retain an important role in guiding management decisions for these areas (Barr, 2001). The current planning process and management of MPAs does not effectively accomplish this.

BNP faces many management challenges regarding the use and conservation of the park's marine resources. These are similar challenges to most other MPAs worldwide: lack of funding, lack of user knowledge, loss of mangrove shoreline, urbanization pressures, degradation of water quality due to harmful inputs and run-off (Indab & Suarez-Aspilla, 2004).

BNP does not, however, approach solving these challenges in similar ways to MPAs throughout the world. Outside of the US, there are successful cases of local community inclusion in the on-going management of marine protected areas in order to bridge the gap between use and resource protection (Indab & Suarez-Aspilla, 2004). The US is currently developing a national system to unite the fractured units of MPAs in the nation. A key objective calls for increased stakeholder involvement and public awareness (National Marine Protected Areas Center, 2008).

2.4.3.1 Damage to corals and fisheries

BNP is one of 207 coral reef ecosystem MPAs in US. MPAs are an important tool in coral reef management (Wusinich-Mendez & Trappe, 2007) Coral reefs are often vulnerable to human induced injury as well as to activities associated with tourism (Tilmant et al., 2004). Coral reefs occur in relatively shallow water, are utilized by the boating public, and are often located near navigation and shipping channels. Injuries from careless shipping vessels, recreational boat groundings, anchors, sport divers, and fishing gear often compound the effect of other reef stresses and create a need for resource managers to restore the injured resource (Fig. 2.11).

Biscayne National Park, Dry Tortugas National Park, Virgin Islands National Park, and other coral reef parks in the Pacific have all suffered reef injury incidents caused by grounded vessels and reckless visitors (Tilmant et al., 2004).



Figure 2.11. Propeller scars within the seagrass meadows below Biscayne Bay. Improper boating in this way damages seagrass and wildlife habitat (Author, 2009).

Intensified local uses, overfishing, coastal construction, nutrient enrichment, increased runoff and sedimentation drastically harm corals and the ecosystems they depend upon (Reigl et al., 2009). Already, nearly 20% of the world's coral reefs are lost and approximately 26% are under imminent threat. Overfishing is the primary threat to about 60% of Caribbean coral reefs, including Biscayne's (Wilkinson, 2006). Coral reefs create, however, an annual income in south Florida alone of over \$4 billion. Reigl et al. (2009) suggest that no conflict between development, societal welfare, and coral reef conservation need exist.

Despite growing threats, decisive action to protect these economically and ecologically high-value ecosystems can occur. Local communities, for example, often support coral reef conservation in order to raise income potential associated with tourism and improved resource levels (Reigl et al., 2009).

2.4.3.2 BNP management response

In order to mitigate many of the resource threats, BNP created a Fisheries Management Plan and is revising their GMP to potentially create Marine Reserves within the park. Rather than calling for local input, both of these management plans outline rules and regulations for proper resource preservation and recreation. If Marine Reserves are established in BNP, they would define "no-take" areas within specific over-fished boundaries.

The intent of these zoned reserves would be to allow fish stocks to increase. These areas would be limited to exploration activities only, in order to provide a higher quality experience for snorkelers.

Like many of the other management issues surrounding BNP, support for establishing Marine Reserves is divided. This issue polarized the preliminary working group making recommendations about the future of fishery management in BNP (*Miami Herald*, 2004). Members representing commercial and recreational fishing interests vehemently opposed no-fishing zones; the representatives of scientists and conservationists were strongly in favor (*Miami Herald*, 2004). This issue is heated even five years later: “The National Park Service appears poised to make a very bad decision and the window of opportunity for concerned anglers to voice their opinions will soon close” (Brown, 2009). For many years, sport fish have attracted anglers who, some argue, visit BNP to take in the scenery as well as to fish. These locals worry that much of that could end if the Biscayne continues with its proposed zoning (Brown, 2009).

2.5 Current Park Management

2.5.1 Mission statement

Biscayne National Park was:

“established to preserve, protect, and interpret an extensive undeveloped mainland mangrove shoreline and associated wetlands, much of middle and lower Biscayne Bay, the northern-most chain of coral keys in the US, and 20 miles of submerged living coral reef”.

The establishment also provides “appropriate public recreation opportunities” (Biscayne National Park, 1983).

This mission speaks not only to the preservation of south Florida’s marine natural resources, but also to its role as National Park in provide enjoyment for the public. Similar to national parks throughout the country, BNP faces challenges in upholding their mission to preserve resources and provide experiences for the public. One of the primary reasons for the establishment of Biscayne as a National Park was its unique tropical marine environment consisting of a productive coral reef ecosystem, and the bay that flows into important habitat and the larger Florida Keys ecosystem (Ault et al., 2001). Therefore, much of BNP’s establishment was based around its unique resources in an ever-expanding urban environment. In order to gain public support, however, BNP was created with the promise of unique recreation experiences which, as has been described, can be detrimental to the very resources they are preserving. In BNP’s case, a reason for this may be that the word *appropriate* is used when referring to the recreation activities that BNP exists for. This word is open to interpretation.

The park’s original GMP (1983) also called for access to the park and its resources for the “non-boating” public. This mandate increased the variety of recreation BNP offered such as boat tours and Ranger programs on the mainland. BNP soon became a popular destination in the south Florida area for snorkeling, hiking, and camping (Negrete, 2008).

This mission differs from those of the similar Marine Protected Areas surrounding BNP. Acknowledging the significance of Florida's coral reef system, and the threats it faces, federal and state agencies initiated efforts to protect the reefs (Wusinich-Mendez & Trappe, 2007). The state's first effort was the establishment of John Pennekamp Coral Reef State Park in 1963—the first underwater park in the United States. This state park allows for the similar recreational uses as BNP, but is not as locally used. Also, the park's main purpose is the protection and interpretation of the coral reef ecosystem.

The federal government recognized the need for additional marine ecosystem protection and established the Florida Keys National Marine Sanctuary (FKNMS) in 1990 (Wusinich-Mendez & Trappe, 2007). The entire south Florida coral reef tract is now protected (Fig. 2.12). As with most MPAs, protection and use is defined and managed by various state and federal agencies. The National Oceanic and Atmospheric Administration (NOAA) cooperatively manages the FKNMS with the Florida Department of Environmental Protection and the Florida Fish and Wildlife Conservation Commission. The mission of this MPA is driven by protection. It allows for highly restricted uses of the marine resources and the managing agencies main role is to monitor the health of the coral ecosystem (NOAA, 200). All of these MPAs face the same complexities in management due to their urban locations and fluid boundaries.



Figure 2.12. Map of Marine Protected Areas in south Florida.

2.5.1.1 Differences between local visitor use and BNP mission

Evidence of resource damage added to information provided by key informants suggest that there is a disjunct between the mission set during BNP establishment and current recreational behaviors, creating tension between management and users.

Particularly, because they are the majority of BNP visitors, local residents are presumed to be the culprits in detrimental behavior. This may be attributed to a lack of awareness and knowledge about BNP.

External factors influence the resources and management of BNP, and are difficult to control for. A variety of internal management issues related to visitor behavior also greatly impact management decisions of BNP and in a way are more manageable. Damage to coral reefs through irresponsible fishing and boating is one example. In general, the current issues within BNP revolve around recreation activities not coinciding with the park's purpose and management objectives.

A suspected reason for paradoxical local behavior may be that for decades, Biscayne National Park has “remained a secret so hidden that most visitors don't even know they're in it when they are” (*Miami Herald*, 1988). A key informant for this study offered another way to explain this phenomenon: “they [local visitors] wake up each day and see or hear about Biscayne Bay, whether through the news or weather report, it's such a part of their lives that they tend to take advantage of it and don't think of it as a National Park” (Key Informant 3).

Specific management challenges related to local visitor misuse of BNP resources were described by key informants to include over-crowding at a manmade sandbar in the bay, conflict between boating uses of BNP, littering and pollution, over-fishing, and improper anchoring (Fig. 2.11, above).

2.5.2 Interactions of BNP management and local communities

Biscayne National Park management has had a well-established relationship with the surrounding communities since its beginnings; after all, it was the majority of local residents who fought for its establishment. The local communities of which BNP is now a part of include those within Miami-Dade and Monroe Counties: Homestead, Florida City, the Florida Keys, and greater Miami (Fig. 2.13).

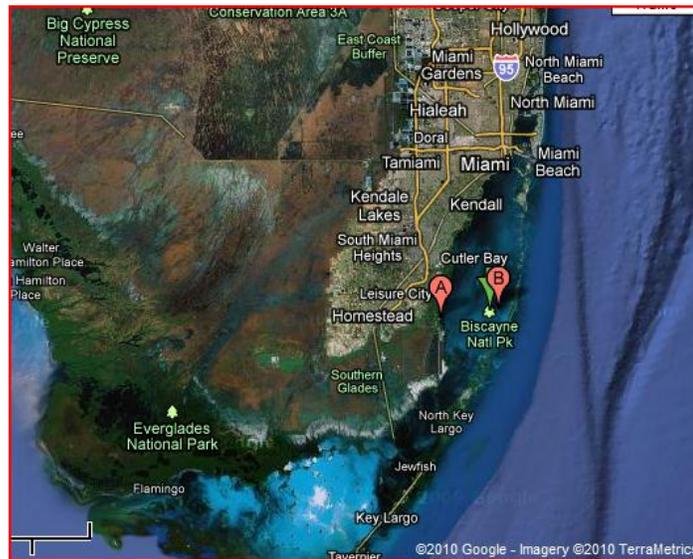


Figure 2.13. Map of Biscayne National Park and major surrounding communities (Google, 2010).

BNP staff interact with the residents of these cities through hosting and attending various events during the year. BNP offers daily interpretive programs for visitors as well as monthly family festivals and quarterly art exhibit openings. BNP also hosts annual events such as *March for Parks* which aims at drawing more minorities to parks (Biscayne National Park, 2009).

BNP staff participate in outreach within the surrounding community, e.g., Rangers judge science fairs and offer information at festivals and schools. Biscayne staff also act as an educational presence through fishery awareness classes. These classes are offered to fishers who have broken regulations within BNP, to both lower the term of their punishment and to prevent future damage to the resource (Biscayne National Park, 2009). Local residents participate in all of these activities. They utilize BNP for holiday celebrations such as the Columbus Day Regatta and July 4th, events that reveal differing perspectives of appropriate recreation between management and park users (Biscayne National Park, 2009). During such events, popular locations within BNP become densely crowded with visitors and often littering, illegal activities, and deviant behavior occurs.

2.6 BNP General Management Plan Revisions

For multiple reasons, BNP is currently revising its General Management Plan (GMP) for the first time since 1983. As a national park requirement in response to NEPA regulations, changing demographic and development settings, and increasing threats to natural resources, BNP management is reassessing park zoning, regulations, and policies. Because BNP is such a locally used park, managers would specifically like to define and clarify BNP's relationship with the surrounding community (Canzanelli 2000, 2001, 2003). Greater interaction with the park's neighboring public can potentially alleviate disruptions, crowding, deviant behavior, and large, noisy parties such as the Columbus Day Regatta.

The local community appears to have changed its motivations for and activities within in the park over the past decade. In order to gather input from local communities, the park managers have requested public involvement through a series of scoping meetings and other forms of input (Canzanelli, 2003).

The 2000 scoping revealed the public's desire that the park work in concert with local communities (Canzanelli, 2001). Suggestions from the public included, for example, recognition of the change in community demographics, diverse cultures, the need for outreach into non-traditional communities, and outreach to boaters. Participants in the scoping also indicated a need to instill stewardship values, to make the public aware of "the significant resources at their doorstep," to foster deeper collaboration with boundary communities, to work with surrounding land owners, to provide more environmental education activities, and promote awareness of the park's unique resource. Suggestions from the public capture park management's need to understand changing visitor behavior. There is a lack of data on local community involvement within US national parks, and BNP in particular.

The park, as part of a nationwide NPS campaign, has outlined Centennial Initiatives for the 100th anniversary of the NPS in 2016. The initiatives taking place at BNP also speak to fostering resource stewardship, scientific inquiry, and connecting with the park's community members (Biscayne National Park, 2008). Through these Centennial Initiatives, BNP management hopes to encourage activities that are more aligned with the mission than those presently observed in BNP.

2.6.1 Purpose of Research

This study was developed in response to BNP's scoping and Centennial Initiative needs to include local community residents in park planning, specifically local visitors. It also builds on earlier research that describes involvement of the local public in national park management as beneficial for both park natural resources and the local community.

In order to inform Biscayne's GMP revisions, this study investigates how local park visitors may have changed their primary uses of BNP over the past decade. Local users do not seem to demonstrate awareness of one of Biscayne's essential resources, the coral reef. In the past, primary park uses were for fishing, snorkeling, and SCUBA diving. Now it appears that the majority of park visitors focus on sunbathing, barbecue parties, beach sports, and group gatherings, making use of the mainland lawns and important island habitat. These trends indicate that BNP usage is being converted from what management defines as low impact, inquiry-based activities to behaviors potentially contributing to environmental degradation.

BNP has also sought public input on potentially creating Marine Reserves within the park. Conserving the coral reef ecosystem and providing a locus for visitors to "experience tranquility, scenic vistas, compatible recreation and the underwater environment" were original management goals (Biscayne National Park, 1983). It was deemed essential to investigate changes in local visitor behavior if their current activities do not align with Biscayne's mission.

2.6.1.1 Study objectives

The goal of this research study was to better understand and analyze the interactions between BNP and its local community with regard to visitor use, participation in park management, and park planning.

The study objectives were:

- 1) To identify and rank frequency and importance values of park-based activities engaged in by local community visitors to determine patterns and processes of current BNP uses.
- 2) To assess local users' awareness of BNP's ecologically important marine resources, and analyze the importance of these marine resources to local community visitors.
- 3) To determine the degree of alignment between current BNP usage and BNP's stated mission.

These research objectives were identified with input from the management of Biscayne National Park, including the Park Superintendent, Chief Interpretation Ranger, and Education Coordinator. The objectives respond in part to NPS inquiries regarding local park visitor use and behavior, and serve as input in the planning process for BNP's revised General Management Plan.

Chapter 3: Methods

3.1 Introduction

Two major forces were driving this BNP study: (1) GMP revisions calling for clarification of BNP's relationship with locals and (2) observations of conflicts between local use and park management expectations and objectives.

The goal of this research study was to gain insight into the interactions between Biscayne National Park (BNP) and its local community, with regard to visitor use, participation in park management, and park planning. In order to gain this understanding of the role of local park visitors in BNP, the study objectives were:

- 1) To determine patterns and processes of current BNP local resident use.
 - a. Identify park-based activities engaged in by local community visitors.
 - b. Rank frequency and importance values of park-based activities.
- 2) To analyze the importance of marine resources to local community visitors.
 - a. Assess local users' awareness of BNP's ecologically important marine resources.
- 3) To determine the degree of alignment between current BNP usage and BNP's stated mission.

Input from the management of Biscayne National Park contributed to the identification of these specific research objectives. The objectives respond in part to NPS concerns regarding local park visitor use and behavior. Conclusions and recommendations will serve as input in the planning process for BNP's revised General Management Plan.

The study was framed by the following research questions:

- 1) How and why do local visitors currently use Biscayne National Park?
- 2) What is the relationship between BNP and local visitors?
 - a. How do local visitors perceive BNP?
 - b. Are local visitors aware of the park's natural resources?
 - c. Do local visitors participate in inquiry and reef-based activities (which coincide with the mission of BNP)?

3.1.1 Use of mixed methods

Mixed quantitative and qualitative methods in the form of semi-structured interviews were used to collect data from local BNP visitor respondents (Creswell, 2009; Patton, 2002; Smith, 1995). The semi-structured interview format ensured that respondents had the opportunity to provide rich and complete information, more so than a structured process might allow. Interview questions were organized according to the research objectives; however, they were not necessarily asked in any particular order. When necessary, logical prompting was used to elicit responses.

3.1.2 Confidentiality preparations

The NC State University's IRB-approved procedures for maintaining confidentiality of the interview respondents consisted of recording numerical identifiers for each on the protocol sheet. The hard copies of the interview protocols, signed informed consent forms, and any tape recording were to be stored in a locked cabinet in my graduate advisor's office. The transcribed interviews were saved on a password-protected laptop, only available to me and my advisor.

3.1.3 Completed interviews

Sixty interviews were completed; 40 during the summer period between June 5, 2009 to August 8, 2009 and 20 between December 7 and 18, 2009. During summer, of the 43 local visitors approached, 93% agreed to complete an interview. In the winter season, 22 local visitors were approached and 90% of them agreed to participate in an interview. During each visit, the number of interviews conducted was based on the availability of local visitors, available research time at BNP, and the point at which responses reached saturation.

3.2 Mixed Methods Research

3.2.1 Qualitative methodology

In order to determine the most effective strategy for collecting data in this study, a literature review was completed on various qualitative and mixed data collection methods.

Typically, questionnaires and surveys are utilized in National Park Service social science research, to quantify visitation and visitor satisfaction (Manning, 1999). Semi-structured interviews with open-ended questions were chosen for this research as the ideal method for data collection because they more effectively provide deeper answers and insights about interactions with the park. Therefore richer information could be gathered. The semi-structured interview process was also chosen because it is best for such exploratory research, more enjoyable for respondents, and confusing questions or responses can be clarified.

Through open-ended questions, responses can be clarified to gather enhanced information on individual's attitudes, knowledge, and values (Creswell, 2009; Gray, 2004; Patton, 2002). The high number of Spanish-speakers in south Florida was also a consideration for the use of interviews, based on the notion that open-ended questions produce higher response rates in cases where respondents speak a different language than the researcher (Gray, 2004).

3.2.2 Quantitative methodology

Demographic characteristics and Likert-type rating scales were included in closed-ended, quantitative questions within the interviews. These are recommended and commonly used in recreation studies in order to gain specific information on resource users (Manning, 1999).

3.3 Sources of Data

3.3.1 Key informants

Three Biscayne National Park staff members and a long-term volunteer served as key informants and provided background and context of this study. Contacts with key informants were initiated in February of 2009.

3.3.1.1 Key informant characteristics (Table 3.1)

Key informant 1 acted as the primary key informant for planning, preparing, and conducting the study. As a ten- year employee who had worked in multiple Park divisions, this key informant was able to provide important background information on local use of BNP. She was also integral to the process of obtaining data by describing potential “categories” of interview respondents. In order to gain a representative and semi-stratified sample of local visitors, she offered suggestions for what types of visitors to approach and when and where to conduct interviews. Informal conversations regarding this research project began through e-mail and phone in February 2009 and continued face-to-face nearly every day for approximately eight weeks.

Key informant 1 initiated contact with a second key informant. Key informant 2 oversees an entire division of BNP, the largest within the park. Because of this, she offered important context for the study, relating to the priorities of the park. She was the primary connection with BNP’s Superintendent and helped to identify research questions and objectives. Our conversations were more formal, conducted through e-mail, and lasted from February to April of 2009.

Key informant 3 was a long-term Interpretation Ranger, who was active in park management and events for local visitors. This Ranger provided information on how demographics of the area have changed in the last decade and how the local visitor base of BNP has also changed. He also commented on how local residents use and perceive BNP. He was interviewed once on June 15, 2009, for approximately 30 minutes.

The fourth key informant in this study offered insights into local visitor use and behavior in the park. He was a long-term volunteer with BNP; an informal conversation with him was conducted throughout an eight hour day of park maintenance out on the water.

Numerical Identifier	Key Informant Description
1	Primary key informant; suggested who and where to interview within BNP; integral in planning the implementing the study.
2	Offered context to the study and made contact with BNP's Superintendent to identify research questions and park priorities.
3	Long-term BNP staff member; provided insights on local visitor use and perceptions.
4	Long-term BNP volunteer; offered perspective on local visitor behavior.

3.3.1.2 Key informant interview mechanism

Informal e-mails and phone conversations regarding the purpose of this study, specific research questions, and logistics of completing the study were conducted in the months prior to this study's approval and implementation in BNP (from February-May 2009). A formal interview mechanism was not utilized during these conversations.

Once at BNP during the summer of 2009 (June-August), in-person conversations, both informal and formal, were conducted based on an NC State University IRB-approved pro forma. The pro forma was created specifically for discussions with key informants at BNP (Appendix II). Topics and questions centered on understanding past and current trends in local visitor use of BNP with an additional goal of gaining insight into the degree of alignment between local visitor use and perception of BNP with the Park's objectives. Because the pro forma was not structured, each conversation was guided by the key informant's flow of thought; responses were recorded by hand in a notebook or on the pro forma sheet.

Confidentiality of the key informants was maintained by the use of numerical identifiers on pro forma sheets. Consent was gained for each key informant by providing them with an IRB-approved consent form (Appendix III) describing the purpose of the study, their role in it, indirect benefits to them, and assurance of confidentiality. I kept a signed copy of this form and the key informant also received a copy.

3.3.2 Secondary sources of data

3.3.2.1 News media

Various local news sources of Miami-Dade County provided information on the visibility of BNP to the local community.

Newspaper sources accessed electronically included the *Miami Herald*, *Miami Today News*, *Miami New Times*, and *the Sun Sentinel*. “Biscayne National Park” was the search term.

Information was gathered on local participation in BNP.

3.3.2.2 Biscayne National Park documents

Biscayne National Park documents presenting relevant press releases, news stories, and visitor statistics over the past ten years were also searched electronically. The park’s web-site was the main source for this information (Biscayne National Park, 2009). The National Park Service’s social science web-site was used to locate previous studies on visitation and obtain current visitation statistics for BNP (University of Idaho, 2001).

3.3.3 Primary respondents

Local park visitors were the subjects for this study; non-locals were excluded. “Local” was defined as residing either in Miami-Dade or Monroe County, the two counties that closely border BNP (Fig.3.1). Because no baseline existed for data collection and the exploratory nature of this study, convenience sampling was utilized. Although the goal was to choose respondents by type of recreation activity and location within BNP, I conducted interviews with those visitors that I could access in my limited time. Another limiting factor of choosing respondents included inclement weather conditions that hindered certain activities and visitors throughout the summer season.

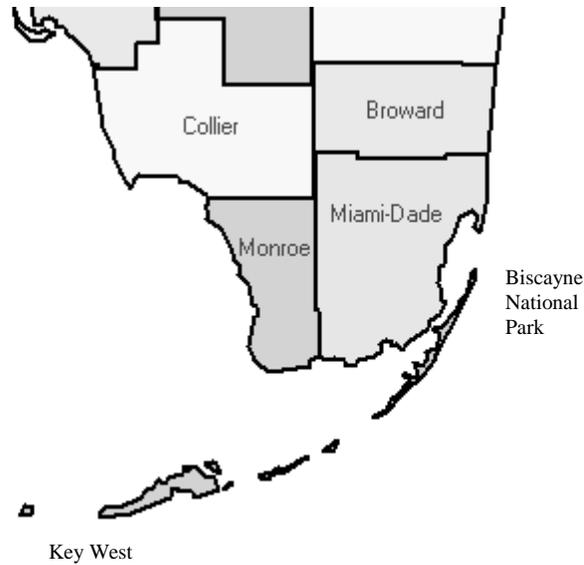


Figure 3.1. Map of South Florida Counties in relation to Biscayne National Park (cohp.org, 2009). Miami-Dade and Monroe Counties most closely border BNP.

Following the recommendation to “select a sample that allows for a subject to be viewed from all relevant perspectives” (Gray, 2004), my primary key informant provided information on the various types of local park visitors, and suggested when and where to find them within BNP.

Visitor types were identified as:

- jetty fishermen,
- picnickers,
- boat renters,
- flats fishers,
- large boat owners,
- smaller boat owners, and
- visitors near Sand’s Cut.

Key informants recommended where best to find these visitor types within the Park, as well as the best days of the week and times of day. A semi-stratified sample was also desired, so respondents were chosen based on their activity as well as a variety of demographic characteristics (i.e. age, race, and family status).

3.4 Design of Interview Protocol

Semi-structured interviews were utilized in order to determine how local park visitors use and value BNP, and their awareness of its natural resources. The interview included collection of demographic information (i.e. age, race, income class, education level, etc.). A series of open-ended questions followed, concerning the respondent's perspective on National Parks and Biscayne in particular. Likert-type scales were used to determine importance values for the Park's natural resources, recreation activities, and environmental conditions. The interview protocol is attached as Appendix IV.

An IRB application packet which included the protocol and clarification of how confidentiality would be maintained was submitted to North Carolina State University's Institutional Review Board (IRB) (Appendix V). An informed consent form for respondents was also submitted (Appendix VI). IRB approval was received on May 14, 2009 (Appendix VII).

3.5 Administration of Local Visitor Interviews

3.5.1 Locations of interviews

Interviews were conducted on the mainland of Biscayne National Park, as well as within Biscayne Bay and adjacent marinas (Fig. 3.2). On the mainland, interview sites included inside the Dante Fascall Visitor Center, the grounds surrounding the Visitor Center building, and along the jetty trail (Fig.3.2; Fig. 3.3; Fig. 3.4). Areas within the park only accessible by boat were also included as interview locations in order to reach local visitors recreating on the water. Anchored boats were approached within Biscayne Bay and near the popular keys (Elliott and Boca Chita) (Fig. 3.2). Local visitors snorkeling on coral reefs in the open ocean were also approached through the Park's Coral Nursery Club. A man-made sandbar near Sand's Cut was also an interview site; this is a very popular area for local residents to anchor and recreate (Fig.3.2; Fig 3.5). Contacts were also made at the surrounding marinas that act as entrances for boaters to BNP. The three main marinas included: Homestead Bayfront, Black Point, and Matheson Hammocks.

Logistical assistance from Park Staff and volunteers was integral to conducting interviews with visitors on the water. I was able to access visitors in the Bay, near Sand's Cut, and in the Coral Nursery Club by joining Park Staff and volunteers on pre-scheduled outings within BNP. The staff was also very helpful in notifying me of when local residents arrived at the Visitor's Center.

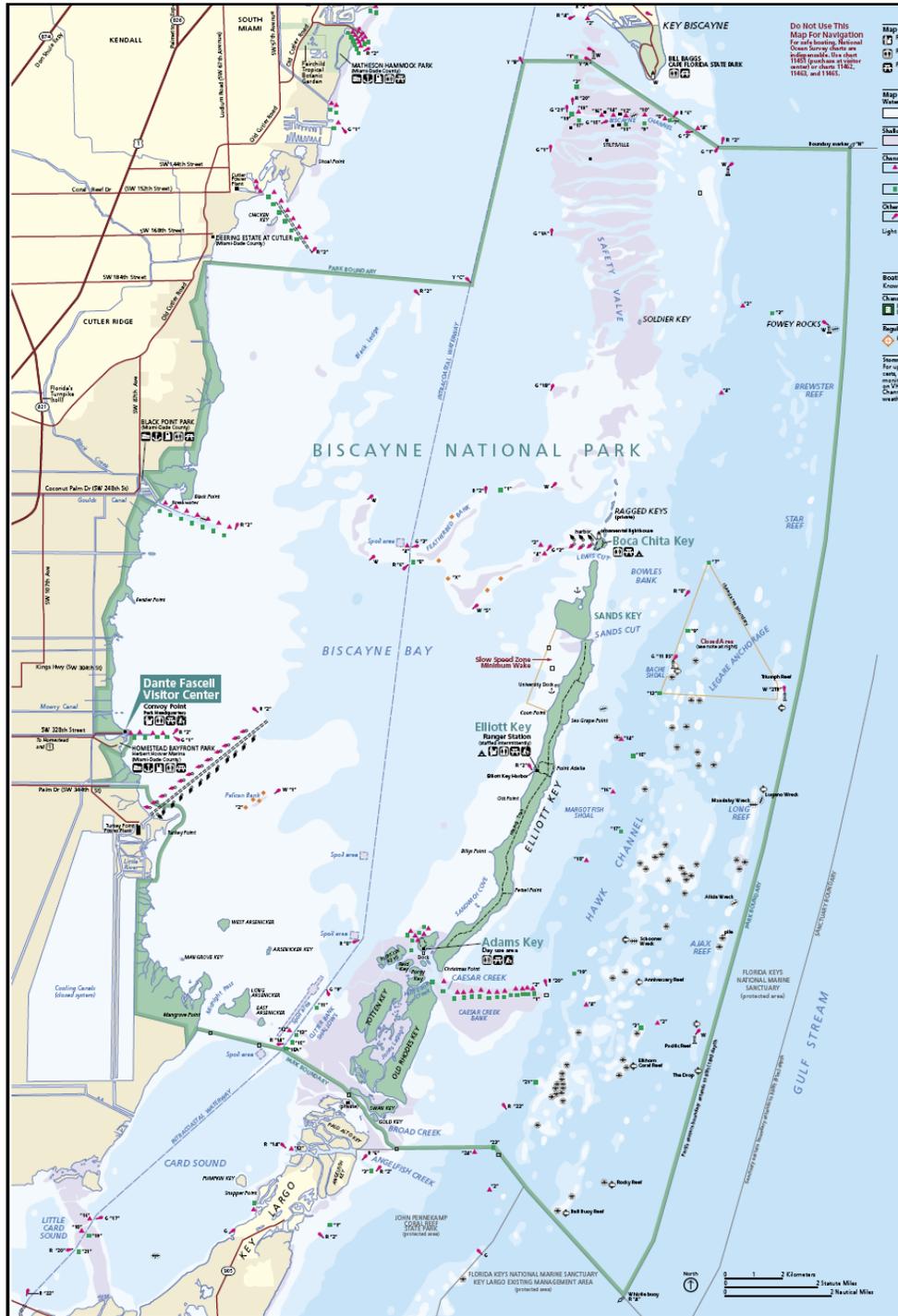


Figure 3.2. Biscayne National Park map (USNPS, 2006). Displays the locations of three main marinas that act as entrance points to BNP: Matheson Hammocks, Blackpoint Park, and Homestead Bayfront. The map also includes the Dante Fascell Vistor’s Center, Biscayne Bay, and Sand’s Cut; all locations where interviews were conducted with local visitors.



Figure 3.3. Satellite image displaying the mainland of BNP (Google, 2010). The Dante Fascell Visitor's Center building appears, as well as the jetty and jetty trail along which local visitors were interviewed. The grassy areas surrounding the buildings were also interviews sites, these are where picnic tables are located.



Figure 3.4. A section of BNP's jetty trail (Author, 2009).



Figure 3.5. Manmade sandbar near Sand's Cut in BNP. This is popular place for many local visitors to anchor and recreate, but it also protects fragile resources within Biscayne Bay (Author, 2009).

3.5.2 Average duration of interviews

The semi-structured interviews lasted between 15 and 30 minutes, based on the amount of time the respondent was willing to give. Questions were not asked in any particular order and were adapted to each respondent. When appropriate, respondents were prompted to describe how they felt about the proposed management changes within BNP, which included the addition of mooring buoys at Sand's Cut, Marine Reserves, or both.

3.5.3 Data collection methods

Respondents were approached while engaged in recreational activities within the park. I wore a NPS volunteer t-shirt and hat to conduct the research. I discovered that this uniform was more effective in gaining the attention and response of visitors than wearing casual attire similar to the visitors.

Eligibility for participating in the study was determined by first asking the potential respondent's place of residence. If interview candidates resided in Miami-Dade or Monroe County, they were asked if they were willing to participate; if not local residents, they were thanked for their time and informed that the study was of local residents only. If a local visitor agreed to participate in an interview, their responses were recorded by hand in a notebook with printed protocol that was visible to them at all times.

Respondents were also asked if they had a preference as to whether or not the interview was tape recorded; I only recorded an interview if the respondent agreed. So many respondents said that they did not want the conversation recorded that I eventually discontinued taking the tape recorder to interviews.

Interviews on the water were either conducted from a motor boat or through wading in shallow water. When approaching an anchored boat within Biscayne Bay, a skilled BNP boat driver pulled alongside boats as I introduced myself and the study, asked if they were a local, and if they would participate in the study. If they agreed, we tied our boat to theirs and I conducted the interview, writing the responses on the protocol sheet. At the sandbar area near Sand's Cut, a BNP volunteer anchored in the shallow water and I waded around, approaching local visitors as they too waded in the water.

At local marinas, I approached locals putting their boats in at docking slips. I asked where in BNP they were going and what activities they would be participating in. Approaching visitors as they arrived allowed more time and interest than when visitors were rushing to leave the marina.

3.5.4 Confidentiality

Prior to conducting each interview, I explained the IRB informed consent form and provided one copy to the respondent, assuring them that their information would not be shared unless aggregated with that of other respondents. The names of the respondents were not required; each was assigned a numerical identifier which was recorded on their protocol response sheet.

3.5.5 Second visit to BNP

A second visit to BNP occurred in December 2009. This provided an opportunity to increase the sample variety and size. Interviewing more local visitors during this time was found to be beneficial in gaining a holistic perspective of local year-round visitation at BNP and to confirm previous findings. Completing more interviews also increased the total sample size and provided for a richer data set.

Twenty interviews were conducted from December 7 to 18, 2009. The same types of visitor respondents were sought in order to maintain consistency and because there is little variation in local use during the winter season. Interviews were conducted within the same locations of BNP as in the summer, and during similar hours of the day.

3.6 Data Analysis

3.6.1 Quantitative data analysis

Descriptive statistics (averages and percentages of the demographic data, visitation habits, and importance rankings) were calculated in Microsoft Excel. The demographic data obtained from each respondent was categorized, totaled, and percentages were found for each category—age range, race, first language, level of educational attainment, and income class. Average distance of residence from BNP, length of local residence, frequency of visitation, boat ownership, and dive certification were also included in the demographic dataset.

The importance values respondents placed on park activities, resources, and environmental qualities or conditions were obtained through Likert scale rankings. Average importance values were then calculated by using weighted averages on the scale of 1-5. I created a table in Microsoft Excel similar to the ones respondents used and recorded the total number of responses for each importance value under each category. I then multiplied the number of responses by the corresponding importance value (1-5), added these up and then divided by the total number of responses to gain the average importance value for each category.

3.6.2 Qualitative data analysis

3.6.2.1 Name of program

Qualitative data from the open-ended interview questions were first coded by hand and then through coding software, *Ethnograph 6.0* (Qualis Research). *Ethnograph* is a qualitative data analysis software program that allows the researcher to upload interview text and code responses. Recurring codes, patterns, and themes are found by using program tools that help to aggregate and quantify coded responses according to the researcher's specifications.

3.6.2.2 Coding process for qualitative data

Respondents were first categorized into six visitor types, depending on the activity the respondents were participating in and their location within the Park. The text was then transferred into *Ethnograph 6.0* and each interview was re-read. The six visitor type categories are shown in table 3.2.

Local visitors recreating on the mainland	Local visitors participating in water-based recreation
Relaxing/walking on the jetty trail	Coral club participants
Picnicking near the jetty	Boating/fishing in Biscayne Bay
Fishing off the jetty	Recreating/relaxing near Sand's Cut

3.6.2.3 Iterations

Through three iterations of coding, I separated out the relevant text and found repeating ideas, words, and phrases (within an individual text and then throughout multiple interviews). These recurring words and phrases were then combined into explanatory themes (Auerbach, 2003; Gray, 2004; Creswell, 2009).

3.7 Reliability and Validity

The reliability of responses was tested through informal observations of respondents prior to, during, and/or after completing the interviews. The space around respondents was observed for litter and their behavior was also noted. There was a percentage of respondents, whose actions did not coincide with their statements, for example breaking a regulation while explaining their reverence for the park.

Revisiting BNP in the winter (December 2009) provided an opportunity to test the validity of study responses. Through completing 20 new interviews, responses were able to be recalculated with a larger dataset. The new demographic and other descriptive statistics, as well as the coding responses produced nearly identical percentages from the calculations of initial responses. These additional interviews confirmed the quantitative data and the qualitative themes founds.

3.7.1 Sources of bias

Much of this research was guided by personal experiences within the National Park Service and BNP in particular. My background in parks and natural resources, as well as with conservation organizations and projects, may have created a bias in favor of National Park creation and agendas. Professional and personal experiences at BNP also contributed to this bias; knowledge of, respect for, and a desire to protect BNP's resources could not be completely ignored while I conducted this study. At times, this may have made it difficult to remain neutral and understand the locals' perspectives.

3.8 Study Limitations

3.8.1 Scope of study

The research conducted responded primarily to the needs of BNP management and therefore only sought input from *visitors* who were members of the local communities. This study was very specific to management needs of BNP. The practical nature of the research may make findings difficult to generalize. The study sample did not include local residents outside of BNP. A more holistic and comprehensive appraisal of BNP's relationship to local communities would include non-visitors. In the examples cited from previous studies on local community involvement in park planning, all members of the community—not just those visiting parks—were included (Eadens et al., 2009; Nepal, 1995; Nicholas et al., 2009).

In the case of BNP, surrounding community members that could contribute to future study include farmers, outfitters and dive shops, schools, and a stratified sample of other local residents.

The results revealed that local visitors, regardless of their knowledge and behavior, have an affinity and appreciation for BNP. This is to be expected; they already are visiting the park. If local residents outside the park were also included, they have a different perspective. A richer understanding of the surrounding community and its use of, perspective on, and interactions with BNP could be achieved by interviewing non-visitor residents, making the social, political, and economic context of Biscayne clearer and better inform the park planning process.

3.8.2 Sampling methods

Even within BNP, a widespread response was not achieved. Locals recreating at the man-made sandbar could only be accessed on weekdays—weekend visitors were not able to be interviewed. The demographics, behavior and activities of weekday visitors are thought to differ from those recreating here on weekend days, possibly resulting in a different perspective. Weekend visitors pose the most challenges for management. If these visitors could have been included in the study, our understanding of park use would have been improved.

The number of interviews completed was in part limited to the amount of research time possible at BNP, both in summer and winter. The amount of time per interview and questions asked—depth of questioning—were limited by the time each visitor respondent was willing to give. This time ranged from 5 to 25 minutes and may have constrained the analysis of responses.

The convenience sampling approach to target respondents may not be strong enough to allow generalization from the study findings. Responses might have been more reliable if a random sampling method or other preconceived form of sampling had been implemented. The nature of this study and time restrictions did not allow for use of such a sampling method.

In retrospect, the research instrument could have been improved. The Likert-type scales for ranking the importance of BNP resources, activities, and environmental conditions did not have a neutral option. A neutral option is suggested so as not force the respondent to make a choice and therefore resulting in a skewing of the data (Manning, 1999).

3.8.3 Research perspective

As a researcher, I maintained association and more identification with BNP staff than with community members and park visitors. I worked more closely with park staff and was seen as a staff member by local park visitors. This connection with park management may have affected the types of responses I obtained.

There was also a divide reflected within BNP management. Three of the four key informants came from the interpretation division, only one was associated with the resource management division. These two park departments have differing perspectives of visitors' use and how best to manage use in relation to resource protection. Therefore, the background information I gleaned on local park use and the guidance key informants provided throughout the study may have been skewed in the direction of interpretation staff. The perspectives of the interpretation division were favored, rather than incorporating multiple viewpoints.

Chapter 4: Analysis of Results

4.1 Introduction

4.1.1 Goal and objectives

As stated in the previous chapters, the goal of this research study was to gain insight into the interactions between Biscayne National Park (BNP) and its local community, with regard to visitor use, participation in park management, and park planning. In order to gain this understanding of the role of local park visitors in BNP, the study objectives were:

- 1) To determine patterns and processes of current BNP local resident use.
 - a. Identify park-based activities engaged in by local community visitors.
 - b. Rank frequency and importance values of park-based activities.
- 2) To analyze the importance of marine resources to local community visitors.
 - a. Assess local users' awareness of BNP's ecologically important marine resources.
- 3) To determine the degree of alignment between current BNP usage and BNP's stated mission.

Mixed data collection methods were utilized in order to address these objectives. Quantitative and qualitative data analyses of semi-structured interview responses confirmed Park staff observations: that residents overlook the marine-based, inquiry-based activities that Biscayne National Park (BNP) offers and prefer social gatherings. Although locals appreciate BNP as an escape from their urban environment, and do value the park's marine resources, their actual knowledge of these resources varies considerably.

This chapter describes the specific findings of this study, focusing first on descriptive information about visitor characteristics and Park use. The respondent overview section (see 4.2) provides demographic data such as race, educational attainment, annual income, and more. Respondents are compared to typical residents of the surrounding communities, within Miami-Dade and Monroe Counties, FL. I review how, when, and where BNP respondents were interviewed.

The next section, 4.3, describes the activity preferences of the respondents, their range of possible recreation activities, types of visitors, and explanations for their preferences. Local visitor characteristics are described in section 4.4 (e.g., purposes for visit, distance of residence from BNP, and frequency of visitation). Section 4.5, the final section, discusses local visitors' knowledge, perceptions, and values associated with BNP as well as explanations for them. Throughout the chapter, recurrent themes that help explain local visitor use and perceptions of BNP are described and analyzed.

4.2 Respondent overview

Sixty interviews were completed out of 65 attempts—a response rate of 92.3%. Respondents were approached while engaged in recreational activities within the Park. Their eligibility for participation was determined by place of residence (Miami-Dade or Monroe County). Participant responses were recorded based on a printed protocol that was visible to them at all times (see Chapter 3).

4.2.1 Respondent demographics

4.2.1.1 Ethnicity (Table 4.1)

The majority of the respondents were either Hispanic (49.1%) or white (43.9%). Three respondents were African-American and one was Asian-American. Not all respondents were willing to answer the question about race/ethnic group.

Ethnicity	Percent	N
Hispanic	49.1	28
White	43.9	25
Other	7.0	4

4.2.1.2 First Language (Table 4.2)

The majority of respondents stated English to be their first language (56.8%); followed by Spanish (40.5%). One respondent (3.0%) had French as their first language. As with racial/ethnic identification, not all respondents replied to the first language question.

Table 4.2 Respondent first language (N=37)		
Language	Percent	N
English	56.8	21
Spanish	40.5	15
Other	3.0	1

4.2.1.3 Age and Gender

The typical Biscayne National Park local visitor interviewed was between the ages of 31-40 (45.6%), followed by ages 41-50 (19.3%), 51-60 (15.8%), and 61 or over (8.8%). Few respondents were under the age of 30—only 8.8% between the ages of 22-30, and only 1.8% between 18 and 21 (Table 4.3). 60% of respondents were male (Table 4.4). There were no correlations between gender and visitor type.

Table 4.3. Age of respondents (N=57)		
Age Range	Percent	N
18-21	1.8	1
22-30	8.8	5
31-40	45.6	26
41-50	19.3	11
51-60	15.8	9
61 or Over	8.8	5

Table 4.4. Gender of respondents (N=60)		
Gender	Percent	N
Male	60.0	36
Female	40.0	24

4.2.1.4 Educational Attainment (Table 4.5)

Nearly half of respondents (45.2%) had completed High School or earned their GED and 38.7% had received a 4-year degree or higher (16.1% received a 4-year degree and 22.6% obtained a Graduate degree). Only a few respondents had a less than high school education (6.5%), a 2-year degree (6.5%), or some college (3.2%). Not all respondents stated their educational background.

Table 4.5. Respondent educational attainment (N=31)		
Education	Percent	N
< High School	6.5	2
High School/GED	45.2	14
Some college	3.2	1
2-year college degree	6.5	2
4-year degree (BA, BS)	16.1	5
Graduate Degree (MS, PhD)	22.6	7

4.2.1.5 Income class (Table 4.6)

Only half of all respondents were willing to answer question regarding income. Of those who provided income information, a third reported earning more than \$60,000 a year, 23.3% between \$50,000 and \$59,999 a year, and 16.7% between \$40,000-\$49,999.

There were few respondents who reported making less than \$40,000 a year; 13.3% between \$30,000-\$39,999, 10% between \$20,000-\$29,999 and 6.7% less than \$20,000 annually.

Table 4.6. Respondent income (N=30)		
Annual income	Percent	N
< \$20,000	6.7	2
\$20,000-29,999	10	3
\$30,000-39,999	13.3	4
\$40,000-49,999	16.7	5
\$50,000-59,999	23.3	7
> \$60,000	30	9

4.2.1.6 Family status

Eighty percent of respondents were part of a family group on their visit. A “family” was defined as a couple, a parent/guardian with children, or multiple generations. All of the most frequently encountered visitors (the 31-40 year olds) were in family groups and 73% had children under the age of 18.

4.2.2 Were respondents typical residents of Miami-Dade and Monroe counties?

The Hispanic population visiting BNP was slightly higher than the average population of Hispanics in Miami-Dade and Monroe counties (US Census Bureau, 2009) (Table 4.7), whereas African-Americans were underrepresented. Native Americans, those of Asian descent, and other races were not represented in this study nor are they highly represented in Miami-Dade and Monroe Counties based on Census data. Males are slightly over-represented (Table 4.7).

Among BNP visitors, educational attainment was considerably higher than the Miami-Dade/Monroe county average (Table 4.7) (US Census Bureau, 2009), suggesting that citizens of lower education levels may not be visiting BNP. These phenomena are addressed in Chapter 5.

It may not be surprising that visitors over the age of 60 were underrepresented among respondents (Table 4.7). Although 21% of the population in Miami-Dade and Monroe counties is over the age of 60, only 8.8% of respondents were older than 60 (US Census Bureau, 2009). BNP and the activities offered by the park may not be desirable or accessible to the majority of people in this age range.

That the majority of respondents earned over \$50,000 per year corresponds with Census findings and the mean annual income between Miami-Dade and Monroe Counties, which is \$76,861 (Table 4.7).

Table 4.7. Comparison of respondent demographics to 2008 US Census Bureau statistics		
Demographic characteristic	Respondent average	Miami-Dade / Monroe County average
Race/Ethnicity		
Hispanic	49.1	40.7
White	43.9	45.7
African-American	5.3	12.5
Other	1.8	1.9
Educational attainment		
High School/GED	45.2	27.6
Graduate degree	22.6	10.2
4-year degree	16.1	18.2
2-year degree	6.5	8.7
< HS	6.5	16.4
Some college	3.2	18.9
Gender		
Male	60	50.9
Female	40	49.2
First language		
English	56.8	53.5
Spanish	40.5	39.35
Age range *		
> 61	8.8	21.6
Annual income *		
> \$50,000	53.3	51.1
*Lack of comparable census data to age and income classes		

4.2.3 Where local visitor interviews occurred

Specific information about where local visitors recreate within BNP and a map illustrating these locations can be found in the previous chapter (see figures 3.2 and 3.3).

4.2.3.1 Land-based interviews

Interviews on the mainland of BNP occurred within and around the outside of the park's Visitor Center (Fig. 4.1), as well as along a 1.5 mile jetty trail. Other land based interviews took place within the visitor center, at picnic tables just outside the Center, and on the jetty where people were resting on benches, walking or fishing (Fig. 4.2).



Figure 4.1. Dante Fascell Visitor's Center at BNP (Author, 2010).



Figure 4.2. Local visitors fishing off the jetty trail at BNP (Author, 2010).

4.2.3.2 Water-based interviews

Boating local visitors were interviewed both out in the water and entering the waters of BNP at local marinas (Fig. 4.3). Within BNP, interviews occurred with those anchored and recreating or fishing from their boats in Biscayne Bay (Fig. 4.4) or anchored at a manmade sandbar near Sand's Cut (Fig. 4.5). Interviews at marinas were conducted while respondents were putting their boats in the water at docking slips. They were asked what part of BNP they were going to and what activities they would be participating in.



Figure 4.3. Homestead Bayfront Marina; a local marina adjacent to BNP where respondents were interviewed (Author, 2009).



Figure 4.4. Boats anchored within Biscayne Bay. Local visitors were interviewed here, found recreating and fishing (Author, 2009).



Figure 4.5. Boats anchored a manmade sandbar by Sand's Cut. This is a popular place within BNP for locals to recreate (Author, 2009).

4.2.4 When local visitors were interviewed

4.2.4.1 Summer 2009

Forty interviews were conducted during the summer period of June 5th until August 8th, 2009. Of the forty-three local visitors approached, 93% agreed to complete an interview. A small percentage of these respondents were part of a volunteer group who assist Resource Management with monitoring and restoring coral reefs within Biscayne National Park. This every-Saturday effort is a partnership with local University of Miami, but volunteers of all ages and demographics are invited to participate.

4.2.4.2 December 2009

In the winter season, from December 7th-18th 2009, 22 local visitors were approached and 90% agreed to participate in an interview.

Many of the visitors on the mainland during the winter season were participating in Family Fun Fest. This is a monthly family event offered at BNP from December to April for the past ten years. It includes environmental education, interpretation, and family activities centered on a specific theme.

4.3 Local visitor activity preferences

4.3.1 Range of possible activities

Specific descriptions of all the activities BNP offers throughout the year can be found in Chapter 2. In general, BNP offers marine-based recreation activities that range from picnicking along Biscayne Bay, fishing throughout the park, to snorkeling and camping.

4.3.2 Respondent activities (Table 4.8)

Six different categories of visitor activities have been identified (Table 4.8), three of which are categorized as land-based and three as water-based. A third of all respondents (31.7%) were relaxing or walking along the mainland's jetty trail, 21% fished from the jetty trail on the mainland of the park (Fig. 4.6), and only 10% picnicked (Fig. 4.7). Those boating or fishing within Biscayne Bay (Fig. 4.8) represented 18.3% of all locals interviewed and the boating public near Sand's Cut (Fig. 4.9) was 16.7%. Only two (3.3%) local visitors interviewed included volunteers in the coral nursery club, reflecting the generally low participation in this activity at BNP.

Based on respondents' top three activity choices, coded from the open-ended questions, activity preferences correspond with those most visitors were participating in at the time of their interview. Of the respondents asked, all stated that they preferred to be participating in the exact recreation activity they were at the time of the interview. The top three activities mentioned were therefore: relaxing, fishing, and boating. A third of respondents mentioned snorkeling as a top three activity although no one was engaged in this activity when approached for the interview.

Table 4.8. Percentage of local BNP visitors by type		
Visitor Type	N	Percent
Land-based activities	37	61.7%
Walking/relaxing	19	31.7%
Fishing	12	20.0%
Picnicking	6	10.0%
Water-based activities	23	38.3%
Biscayne Bay boat/fish	11	18.3%
Sand's Cut boat/relax	10	16.7%
Coral Club (volunteers)	2	3.3%
Total	60	



Figure 4.6. Local BNP visitors fishing off the jetty trail (Author, 2009).



Figure 4.7. Local BNP visitors picnicking on the mainland (Author, 2009).



Figure 4.8. Local visitors anchored and recreating in Biscayne Bay (Author, 2009).



Figure 4.9. Local BNP visitor's anchored and recreating near Sand's Cut (Author, 2009).

4.3.2.1 Explanations of activity choices (Table 4.9)

The most representative age class, 31-40 year olds, consisted of young couples or families. Their activities varied among the multiple recreation and location categories (Table 4.9). This age group did not appear to favor one activity over another, while the lesser represented age group of 18-22 year olds all recreated on the mainland of BNP and preferred activities of picnicking, fishing, and relaxing with groups of friends.

Nearly half (47%) of all respondents were with children under the age of 18. All interviewees recreating at a man-made sandbar near Sand's Cut were part of a family group. Other family groups also participated in picnicking and fishing at Convoy Point, the mainland of BNP.

There were no other correlations of age with preferred activities; however, all of those respondents between 18 and 30 years old were Hispanic. None of the African American respondents, though a small sample group, were participating in boating activities (Table 4.9). These respondents were located on the mainland, either fishing off the jetty, walking, or relaxing at picnic tables.

Of the visitors interviewed on the water, 59% were White and 41% Hispanic. The combined activity categories of boaters all earned at least \$50,000 a year and 72% had at least a 4-year degree. In fact, all the respondents who earned more than \$60,000 a year were participating in boating activities (Table 4.9).

Table 4.9. Respondent demographic correlations with preferred recreation activities	
Demographic Category	Activity Correlations
Gender	N/A
Age	<ul style="list-style-type: none"> • 31-40 all participated in recreation in family groups, with no distinctions between types of activities. • 18-22 year olds only utilized the mainland (picnicking, fishing, etc.).
Ethnicity	<ul style="list-style-type: none"> • No African Americans utilized water-based activities. • All boaters were either White (59%) or Hispanic (41%).
Education	<ul style="list-style-type: none"> • All boaters had at least a 4-year degree.
Income	<ul style="list-style-type: none"> • All boaters earned > \$60,000/year
Family Status	<ul style="list-style-type: none"> • All visitors utilizing the Sand’s Cut area were in a family group. • Other family activities were fishing (28%) and picnicking (18%).

The majority (61%) of families recreated on the mainland, with 28% fishing, 18% picnicking and, the remaining 54% were mixed activities (i.e. walking, exploring, and relaxing). Of the respondents that were identified in a “family” group, 39% were boating. Only two respondents were alone.

Indeed, safety is a concern for local boating visitors and families. A couple with two young children explained that “they [the children] love coming here and wading in the water, plus it’s safe”. Visitors near Sand’s Cut also explained that they visit and enjoy that area because it is safe, especially because they can drive their boats right up to and be protected from larger wakes and deeper water.

Since over a third (38%) of local visitors owned a motor boat, it is logical that so many were found recreating on the water. Also, only 11% of respondents claimed to own SCUBA diving equipment or certification this may explain why none were found diving at the time of the interview.

4.4 Characteristics of respondents' visits to the BNP

4.4.1 Motivation and purpose for visiting

The main motivations for visiting BNP were based on the park's convenient location; a third of respondents cited such factors as free entrance and close proximity to where they live. Other purposes local visitors use BNP for include fishing, family time and bonding, picnicking, and generally relaxing. A third of respondents mentioned BNP as a place to snorkel but not dive.

Local visitors expressed other motives for visiting such as appreciation and reverence for BNP, and that they depend on the park in multiple ways. Respondents used such phrases as: "we love it here", "what would we do if it weren't here", and "we come here all the time". 40% also described the park as a refuge, and visit it to "get away". To quote a local visitor:

"...To get away. Did you see the name of my boat? It means "the remedy for pains" in Greek. That what this [BNP] is for me, it takes away my pain, my worries."

Another visitor stated:

“Let me explain why we’re here; it’s the best place in Miami. It’s natural, the visitors aren’t noisy, not annoying. It’s quiet and beautiful and reminds me of where I come from in Peru.”

Beauty, scenery, and aesthetics are important visitation reasons to the majority of local visitors (75%). One explained:

“...Beauty for people to appreciate that, you can't get that in the concrete jungle. I'm glad someone had the foresight to preserve these places. Who started the Park Service? Roosevelt, oh, see thank God he thought of this.”

They also described BNP as being clean and cited this as another reason for why they support the park, especially when compared to their other surroundings;

“I think it's really important that they left the islands untouched and preserved for the park, and kept them natural.”

4.4.2 Where did they come from?

4.4.2.1 Where local visitors live

As stated in the previous chapter, local visitors either resided in Miami-Dade or Monroe counties (see Figure 2.12). Specific communities included: Homestead, Florida City, Key Largo, Coral Gables, Kendall, Miami Beach, and others.

4.4.2.2 Distance of residence from BNP

On average, respondents resided 15.2 miles from Biscayne National Park (Table 4.10). Local visitors using the Park’s mainland traveled slightly less far (13.3 miles) than those visitors boating within the park (19 miles). Local visitors walking and relaxing along

the Jetty trail resided an average of 11 miles away; fishers on the Jetty lived 12 miles away; and picnickers resided an average 23 of miles. Coral club volunteers resided an average of 25 miles away while boaters fishing in Biscayne Bay traveled an average of 20 miles and boaters recreating near Sand’s Cut averaged 15 miles.

Though south Florida is densely populated and developed, it is common for residents to travel relatively long distances to their destinations. Local BNP visitors may be more willing to travel this far because they cannot find a comparable location or experience any closer to their home.

Table 4.10. Distance of Residence from BNP disaggregated by activity type (N=45)		
	N	Average (miles)
Jetty-Relaxing/walking	16	11.0
Fishing from Jetty	9	11.9
Sand's Cut-Boating/relaxing	5	15.0
Biscayne Bay-Boating/fishing	8	20.0
Picnicking on mainland	5	23.0
Coral Club (volunteers)	2	25.0
Land-based activities	30	13.3
Water-based activities	15	19.0
Average Distance from BNP		15.2

4.4.3 Frequency of visitation to BNP

A third of all respondents were considered to be “frequent” Park visitors, visiting

BNP at least three days per month. Of the six visitor types, there was very little difference between the average days per month they visit BNP (Table 4.11). Even those who live closer (visitors to Sand’s Cut and the mainland) do not visit more than others. Nearly half (45%) of the respondents have been visiting BNP for more than 5 years.

Table 4.11. Respondent visitation frequencies (Average days/month)		
	N	Average
Land-based activities	13	2.2
Fishing	6	2.5
Picnicking	3	2
Walking/relaxing	4	2
Boat-based activities	13	2.2
Coral Club (volunteers)	2	2.5
Biscayne Bay	5	2.2
Sand's Cut	6	2
Total	26	2.2

4.4.3.1 Seasonal preferences

Over half (67%) of respondents reported visiting the park all year round, while 21% reported that they visit the park mostly during summer season, and only 12% prefer winter visitation. There were no significant differences in activities between those who preferred a season or those interviewed during different seasons. It is important to note that because there is little variation in the seasons and climate of south Florida, activity offerings rarely change seasonally. The main difference between seasonal activities is a decrease in camping due to the large quantity of mosquitoes during summer.

4.5 Knowledge, perceptions, and values

4.5.1 Knowledge

Only half of respondents could correctly identify and explain the ecological importance of BNP's marine resources, though nearly all valued the natural resources and conditions highly. In the open-ended responses as well as importance and value rankings, BNP's resources and ecosystems were described as being very important to the respondents and for all the visitors and park as a whole. "They're all just part of the ecosystem-interdependent-the mangroves help out the others and the whole thing will not go without the others. It has to have that balance." However, their rankings and statements did not always correspond with their knowledge of park natural resources, or their behavior during the interview. Thirty-five percent of respondents would state the importance of Park resources but could not name any resources within the Park or explain why they thought they were important.

Also, 27% of respondents were observed littering, were surrounded by trash, or were disobeying regulations (i.e. fishing off a well-marked restricted area of the jetty) even while they were explaining how they viewed the natural resources to be important. One respondent was describing the amazement he felt when he recently watched a mother and baby manatee in the Bay while simultaneously unwrapping a pack of cigarettes and throwing his trash on the ground, right along the shoreline.

General awareness of the Park's natural resources was mixed. Fifty-two percent of

respondents could correctly identify park resources, as well as explain their ecological importance, and potential threats to them, while 48% of the respondents could not. For those that identified threats to or pressures on resources, human activities were described as the primary threats (i.e. “us”, pollution, sprawl). “I worry about it, it’s the water. There used to be turtle grass all in the bay and now it's fading.”

4.5.4.1 Explanations for knowledge base

Respondents of age 51 or over expressed more knowledge and awareness about BNP and concern for the Park’s resource protection; many of them have been coming to BNP since before it was a National Park. Those between 18 and 30 had a more difficult time defining BNP’s mission, and/or identifying and explaining natural resources. When asked, they were “not sure” or defined the Park as a place to “hang out”. This will be discussed further in the following chapter.

When asked about resource protection, use conflicts, and regulation changes, over a third of respondents expressed a need for more education and interpretation about the park. They explained that they themselves or other visitors did not know enough about park resources and boating regulations. Suggestions for more interpretation programs and signs were provided, as well as warning and educational signs in the water for boaters (i.e. seagrass protections, manatee zones, proper anchoring, etc.).

4.5.2 Perceptions

Perception and knowledge of the NPS and BNP's mission was mixed. The majority of

locals (75%) view the *purpose of US National Parks* as being for recreation and public use, as well as protection of the environment. They used such descriptors as: “preservation”, “conservation”, “for the people”, “recreate”, and to “keep for future generations and their grandchildren”.

In contrast, the majority of respondents described *BNP’s mission* as being solely for the enjoyment and relaxation of the public. Nearly a third of respondents (27%) could not answer either question about: (1) what they thought the purpose and/or mission of National Parks was and (2) what they thought the purpose and/or mission of BNP was. Eighteen percent of respondents did not have an answer for BNP’s mission and 9% for the NPS mission. Their definition of BNP’s mission is not necessarily accurate, but it is how local visitors view the park. Local visitors also expressed a general lack of awareness of BNP’s status as a National Park. Some even explained that they did not know the park existed until they had lived in south Florida for many years.

4.5.2.1 Understanding these perceptions

Those respondents who described themselves as having a higher level of educational attainment (college or graduate degree) were better able to define the purpose of National Parks and BNP. Many suggested that lack of advertising and road signs was one reason that others were not aware BNP existed and/or that it is designated as a National Park. The average length of local residence, either in Miami-Dade or Monroe County, of respondents was 19.1 years. This figure is somewhat surprising, considering the lack of knowledge and

awareness locals expressed about BNP. Such a long average time of residence near BNP would make one think it was more established and well-known throughout the local community than it apparently is.

Locals view BNP as a place to socialize, recreate and spend time with family. The responses toward management potentially establishing mooring buoys near the Sand's Cut area of the park were contentious. All respondents who were asked about this topic provided ambiguous responses. Many visitors described how they know what they're doing, but offered suggestions for a compromise for those who do not; "we'd rather not have buoys at Sand's Cut, a lot of boaters are not knowledgeable though".

There was, however, consensus for the need to preserve fisheries, even if that would mean establishing Marine Reserves throughout BNP. These perspectives are contradictory but illustrate the public's perception of the park being a place for recreation as well as preservation. "Marine reserves would be a better experience for the people snorkeling and to have more fish." Visitors both recreating on the mainland of the park and also on the water agreed that fish stocks are smaller and even decreasing. A local visitor respondent returning from the Bay stated:

"You know, I try to teach my kids how to fish right; if it's too small, we don't keep it. We need these regulations to keep it under control. Yeah, marine reserves would be a good idea; there are so much less fish and they're small. I mean, we were out for 5 hours and only got this small grunt."

There was also a general concern to protect fisheries and provide a better experience for snorkelers. However, at the public scoping meetings where management sought input on

this topic, Marine Reserves were controversial; fishers expressed that they did not want to “pay” for misbehavior of others or have their behavior regulated, especially in a place that they have been utilizing for decades.

4.5.3 Importance Values

4.5.3.1 Most valued within BNP

Of the ten park activities for which respondents were asked to rank importance, wildlife viewing received the highest importance value, with an average ranking of 4.70 out of 5. Local visitors also expressed high importance values for picnicking (4.23), fishing (4.00), swimming (3.78), and non-motor boating (3.78) (Table 4.12).

Table 4.12. Average importance rankings of BNP recreation activities (scale of 1-5)		
BNP activity	N	Avg. Likert score
Wildlife viewing	42	4.69
Picnicking	41	4.17
Fishing	34	4.00
Swimming	41	3.78
Non-motor boating	41	3.78
Boat tours	40	3.65
Snorkeling	39	3.33
Motor boating	44	3.23
Camping	40	3.10
SCUBA diving	39	2.36

Respondents also ranked the importance of Biscayne National Park’s primary natural resources (Table 4. 13). Biscayne Bay was ranked the highest and “very important” by all

respondents, with an average ranking of 4.98. Wildlife received the second highest ranking at 4.95 and the remaining three resources received importance values of 4.81 for the coral reefs, 4.80 for the mangroves, and 4.77 for the keys.

Natural Resource	Avg. Likert score
Biscayne Bay	4.98
Keys	4.95
Wildlife	4.81
Mangrove shoreline	4.79
Coral Reef	4.77

Importance values for eight different qualities or conditions with Biscayne National Park of were also ranked by respondents (Table 4.14). Local visitors ranked all the qualities or conditions as at least being “important”. They expressed water quality as being “very important”, with an average ranking of 4.98. Shoreline protection (from the mangroves) received an average importance value of 4.87; nursery habitat provided by the Bay was valued at 4.84 as was aesthetics of the Park (i.e. scenic views, cleanliness). Biodiversity ranked at 4.79 and fish and lobster stocks at 4.53. Noise level and crowds within the Park were not as important, but did receive importance values of 3.97 and 3.76, respectively.

Table 4.14. Average importance rankings of BNP environmental conditions on a scale of 1-5 (N=38)	
Environmental condition	Avg. Likert score
Water Quality	4.95
Shoreline Protection	4.87
Nursery Habitat	4.84
Aesthetics	4.84
Biological Diversity	4.79
Fish and Lobster Stock	4.53
Noise Level	3.97
Crowds	3.76

4.5.3.2 Least valued within BNP

Boat tours received an average importance ranking of 3.65, with snorkeling at 3.33, and motor-boating receiving 3.23. Of “somewhat” importance to local visitors was camping (3.10). SCUBA and other forms of diving were ranked the lowest (“not very important”) at 2.36 (Table 4.12).

4.5.3.3 Explanation for valuations

Respondents did not discriminate between the importance of BNP’s resources or environmental conditions; these categories received uniform importance values. Because local visitors did make distinctions between BNP recreation activities, it is possible that they were unable to distinguish between other categories like natural resources. This could have

been due to their level of education and awareness of the resources. They may have believed all parts of the environment are equally important, or thought this was the “correct” answer. Regardless, there was a clear disconnect between the high importance rankings of environmental resources and conditions and respondents’ knowledge base. This will be discussed further in chapter 5.

Over half of the respondents expressed concern for crowds or crowding but also did not want anyone to be excluded from the park or its activities. The local visitors rationalized their perspective on crowding; respondents described how they choose to visit the park in less-crowded areas and times of the week. Respondents also explained that they believe BNP is there for all the public to enjoy.

“Crowds, it’s a hard call. You want people to go to appreciate and experience the resource but waiting to view a resource, etc., decreases the feeling of wilderness and freedom.”

Low importance rankings for snorkeling can be explained by the fact that only 11% of respondents mentioned this as a preferred activity; diving was not even mentioned. The low score for motor-boating is somewhat unexpected considering that 38% of respondents owned a boat.

Boat tours receiving a relatively high score is also contradictory to how locals seemed to use the park, however, this is explained by narrative responses. The majority of local visitors are unaware of boat tours at BNP to island habitats and coral reefs offered. They expressed surprise when asked about the importance of this activity, but did state that if they

had known about these, they would utilize them. Many visitors proceeded to ask how, when, where they sign up for a tour. Though they may not have known about them, visitors still placed a high importance value on boat tours, to themselves and to the park.

This lack of awareness was confirmed in local visitors' lack of use of the boat tours that are offered, on average, eight times a week. Based on information provided by the concessionaires and observations in the twelve total weeks local visitor behavior was being studied at Biscayne; no local residents participated in a boat tour, only foreign visitors did. One respondent even explained this, stating "the island tours, no, not for me, they're for the tourists." A respondent who was familiar with the park's boat tours offered reasons behind why locals may not be participating;

"I took an island tour once, to dive, but they are really unreliable, the boats break, they cancel trips, it's hurting them, there's no advertising, they could do a lot better, they're really the only company that offers trips out to this area, it's important. A dive magazine said this is some of the best diving in the area, but they're not showing the resource to people. They need more advertising, it would be better for all."

4.6 Visitor Awareness and Use of Fragile Resources

BNP is advertised and portrayed as a snorkeling destination; the coral reef is presented as one of, if not **the**, most important aspect of the park. But, BNP is rarely used for the reef by locals, the park's most numerous and frequent visitors. What does this mean, and is it bad? At Biscayne, local awareness and support of the boat tours could be increased through advertising if park management truly desires to increase local participation in reef and island activities. This may not be ideal, however because of the fragility of these island

and coral reef resources. Current research recommends decreasing their use (Reigl et al., 2009; Tilmant et al., 2004).

The original BNP management intentions were for visitors to use and experience marine resources. Increased participation in boat tours has the potential to boost awareness and stewardship of cultural resources and coral reefs, but management needs to find that balance between use and preservation. Lack of interest in boat tours and use of fragile reef resources by the majority of BNP's visitors is not necessarily negative or even detrimental to management. Despite locals expressing a desire to learn more boat tour opportunities, they were not a highly ranked activity. Locals and park resources may be better served through focusing management efforts on higher-ranked recreation activities.

The challenge in defining appropriate recreation and recreation outcomes is apparent in the contradiction between the desire to increase local exposure to resources and the need to protect these same resources. As with most public parks and recreation areas, recreation "appropriateness" largely depends on the intentions of park management (Manning, 1999). Just because park users may not be knowledgeable or aware of cultural and environmental resources does not mean that their recreation habits need to change, especially if they are not harming resources. A percentage of locals at BNP both lacked awareness and participated in detrimental behavior, but the majority of those lacking awareness were still utilizing the park in a low-impact manner (i.e. jetty fishing, picnicking, etc.).

4.6.1 Visitor and management expectations

The findings at BNP highlight a common challenge in park management: recreation experience expectations differ between management and visitor (Manning, 1999). Biscayne can better accommodate these expectations and subsequent behavior of local visitors, as it coincides with the park mission. Though the majority of locals do not explore the coral reef resources, as originally intended by BNP, they do appreciate and use Biscayne for picnicking, fishing, and relaxing. These activities mostly have a low-impact on the park's natural resources.

BNP interpretation division management appears to have a different definition not only of “appropriate” recreation but also of “low-impact” recreation activities. The main question driving this research was why locals participate in certain activities now (i.e. picnicking, barbequing, etc.) that are different than popular activities observed in the previous decade (i.e. snorkeling, diving, etc.).

According to BNP management, reef activities such as snorkeling and other inquiry-based activities in the water such as canoeing are considered “low-impact” activities. BNP management views the other activities that the majority of local visitors participate in as high-impact. Based on study findings, this is not accurate. Picnicking and fishing on the mainland are recreation activities that have a low-impact on the resources BNP is designed to protect—coral reefs and fisheries. The social gatherings at Sand's Cut have the possibility to be of greater impact—littering, crowding, noise and water pollution, and seagrass damage occur here.

The actual problem is the specific activities locals choose to participate in, almost regardless of their impact. Park management would prefer fewer social gatherings, although they are low-impact. Rather, they would prefer more interest in the educational and outdoor recreation activities that BNP was established to provide. As stated previously, a shift in activity preferences this way may not actually be beneficial for park resources.

Deciding on appropriate recreation is complex and depends on multiple variables, resource impacts being just one. Visitor experiences and outcomes, such as environmental awareness, need to be taken into consideration. For example, though many respondents participated in low-impact activities, half of them still lacked knowledge of BNP's natural resources and expressed a lack of connection between their activities and rest of park. The majority of respondents also defined BNP's purpose as being for people to recreate and relax. This is quite different from the definition that Biscayne management, the NPS, and possibly even non-locals provide. Potential ways BNP management can balance these perspectives will be discussed in Chapter 5.

Chapter 5: Discussion

5.1 The Importance of Local Inclusion

Based on the study findings, BNP management is in a better position to improve their comprehension of local visitor needs, expectations, and knowledge limitations. As a result, BNP can direct their efforts toward balancing recreational and conservation goals. This chapter will restate the benefits of including locals in national park management and discuss the specific opportunities a park like BNP has to balance local use and perspectives with management priorities. The model of management opportunities introduced in Chapter 1 is built upon in this chapter by including a detailed discussion of corresponding constraints to balancing local and national agendas at BNP.

It is clear from the literature that local residents can play a meaningful role in National Park planning and management and that National Parks can have significant impacts on adjacent local communities. Including local communities in park planning is beneficial to all. The current research contributes to the body of knowledge that supports National Park management interactions with the public on a more local scale (Eadens et al., 2009; Nepal, 1995; Nicholas et al., 2009; Olwig, 2009). The benefits are not always measured, but comprehensive and collaborative locally-based management has become a tool for solving many resource conflicts (Eadens et al., 2009; Nepal, 1995; Nicholas et al., 2009). Establishment of a more reciprocal and trusting relationship at BNP is one more step in assuring mutual benefits at both Park and community levels.

National Parks draw tourists to communities and provide recreation opportunities for local residents. At the same time, local community demands on park resources and park-related development can have a profound effect on the parks (National Parks Conservation Association, 1988). Local partnerships (including those that could be established at BNP) serve extant parks as well as newly created ones. According to Brown (2003), “lived-in landscapes” are becoming the most common units added to Park Service lands. As “nontraditional units”, these places include long distance trails (such as the Appalachian National Scenic Trail), wild and scenic rivers, and heritage areas and corridors. Where borders are increasingly longer relative to ‘interiors’, there is a stronger case for residents of adjacent park communities to be included in planning (Brown & Mitchell, 2006).

Lastly, local involvement is considered particularly important for Marine Protected Areas like BNP (Eagles & McCool, 2002). Many local communities typically are heavily dependent on park resources for their economic base and livelihoods (e.g. subsistence fishing, commercial fishing, guiding, etc.). They are equally dependent on the waters for recreation. Consequently, park policies are influenced strongly by the social, economic, and political interests of local communities.

5.2 A Model for Balancing Local Use and Park Management Priorities

The importance of local inclusion in park management was the basis for the research completed at BNP, but responses revealed considerable differences in use and perceptions between local visitors and BNP management objectives (see section 4.6). What does a park

like BNP do when local use and perspectives differ from those of park management? Figure 5.1 offers a model for national park management to strike a balance between these often conflicting views. This model upon the selection of opportunities introduced in Chapter 1 (Fig. 1.1) by illustrating the corresponding constraints to aligning local use with national agendas.

The central goal within the model (Fig. 1.1, Fig. 5.1) is balancing local park use with NPS management priorities. Branching out from the center are opportunities BNP management has to obtain this balance; they include: (1) use regulations and zoning, (2) “bottom-up” management, (3) market inquiry-based activities, (4) incorporation of cultural differences and use preferences, (5) reaching out to certain marginalized populations, (6) community-building and collaboration.

Six corresponding constraints serve as barriers or hindrances to the viable opportunities. These can severely limit the extent to which the opportunities are implemented (Fig. 5.1). The constraints are: lack of resources, NPS institutional structure, conflict with the park’s mission, threats to vulnerable natural resources, questionable long-term benefits to the park and community, and external influences. Some opportunities have constraints in common and some constraints interact to impede progress toward balance. Park management must consider these interactions before choosing an opportunity.

Each opportunity and their specific corresponding constraints to implementation are described in the following sections. It is up to park management to decide which opportunity

or combination thereof would best address their priorities and correspond with available resources.



Figure 5.1. A model of opportunities and constraints for how US National Parks might balance local use with park management priorities. The constraints can limit the implementation of any opportunity.

5.2.1 Use regulations and zoning

As discussed in Chapter 1, increasing park use regulations and/or zoning specific areas by use would allow for greater protection of resources but could create hostility among local users (Everhart, 1983). Many local park users, especially in a marine area such as BNP, rely on the resources for subsistence or their livelihoods. In addition, much of the resource degradation at BNP is caused by external factors, such as water pollution and over-fishing and not attributed to the behavior of local users.

BNP management assumes resource degradation is mostly a result of local population taking advantage of resources and/or not obeying regulations. As is the case in most US national parks, however, many outside influences are threatening the entire ecosystem often more so than visitors (Mitchell, 2006; Warren, 2006). As one key informant stated, the most challenging and pertinent park management issues [at BNP] are not caused by visitors but rather by external, large-scale forces.

Inputs from outside are thought to be the largest threat to coastal parks (Eagles and McCool, 2002; National Parks Conservation Association, 2006). BNP is surrounded on all sides by encroaching developing—the city of Miami, a landfill, a coal fire and nuclear power plant, an air force base, a race track, and agricultural fields all rest directly on its boundaries. Entirely manmade but external threats to BNP resources and visitor experiences include runoff, sedimentation, and coastal construction, as well as global climate change (Reigl et al., 2009).

Pressures directly outside park boundaries are even more complex in Marine Protected Areas. Matters of ownership, regulation, rules, and enforcement are made more difficult because waters are open to the public and boundaries are difficult to create (Barr, 2001). In addition to this, locals are often more dependent on marine ecosystems. As such, they feel a sense of ownership and entitlement (Barr, 2001) which may be a reason for local behavior at BNP.

The majority of local visitors are opposed to increasing regulations that would limit or change their use of BNP waters. Biscayne is not alone in facing the controversy over creating Marine Reserves. The successful management of reef fisheries has always proven to be an elusive goal because not everyone can be satisfied (Reigl et al., 2009). When asked about resource protection, use conflicts, and regulation changes, locals rather expressed a need for more education and interpretation. Alleviating these issues is limited by the management capacity of BNP.

5.2. 2 “Bottom-up” management and local employment

The opportunity to increase local participation in park management through “bottom-up” strategies such as local employment is limited by the institutional structure of the NPS. Although such a strategy invests the local community in the park and fosters resource stewardship, placing national parks under mostly local control is highly unlikely.

Examples of successful local management are available from protected areas outside of the United States (see Chapter 1) and cannot translate completely into the way our national

parks are managed. The local public cannot solely own nor be the only ones working in national parks because they are owned by all US citizens.

The NPS and other federal land management agencies periodically investigate operating in ways that allow local people to participate proactively in decision making. Frequently, however, these efforts disappear as the political worldview changes or as other external political and economic pressures affect policy.

5.2.3 Market inquiry-based park activities

Promoting increased local use of some park activities such as boating tours that provide access to the reefs and islands would allow BNP management to move participating visitors toward inquiry-based opportunities such as reef snorkeling, diving, and marine wildlife appreciation. On the one hand, more local participation in these activities could result in a greater knowledge, understanding, and appreciation of BNP's resources, thus promoting better stewardship. On the other hand, more boat tours could create a large influx of visitors to fragile resources like the coral reef and primitive islands. Such increased use could further damage resources (see section 4.6). BNP management would have to walk a fine line between increased access and use of resources and accidental or purposeful degradation of resources.

5.2.4 Incorporate cultural differences and use preferences

Cultural differences and insufficient cultural assimilation may be one factor in

perceived visitor mistreatment of BNP resources (Manning & Moore, 2002). Instead of promoting recreation activities park management prefers, BNP management could incorporate an understanding of how cultural differences influence local use and possibly accommodate differing use preferences.

Urban parks, such as Biscayne, provide diverse opportunities for recreation, leisure, and cultural activities (Sasidharan et al., 2006). As described in Chapter 1, urban park usage is growing among ethnic and minority groups. Members of these ethnic groups tend to visit parks in larger social groups, as was found at BNP. Social activities are also understood to be motivation for visiting urban parks, with picnicking and recreating with children as preferred activities (Sasidharan et al., 2006).

It is important for park management to acknowledge these cultural differences and attempt to incorporate them into park management. Management may prefer not to encourage picnicking and large group gatherings, but they can better manage such activities by providing designated picnic areas or specific shelters for social activities. Many respondents offered suggestions along these lines. Locals also proposed more outdoor, shaded shelters, an indoor lounge area, and increasing the gate hours to stay open later. However, immediate and practical solutions do not necessarily produce long-term results when entrenched cultural or educational perspectives about human interactions with the environment exist.

5.2.5 Reach out to certain marginalized populations

South Florida is diverse, but BNP's local visitors are mostly White or Hispanic. In its role as an urban park, is Biscayne representing all the public it is meant to serve? Reaching out to specific population segments would allow BNP to provide access to the park for a broader array of local constituents.

At BNP, African Americans and individuals over sixty were not as well represented as other demographic classes (see section 4.2.2). There was also a noted difference between income class and recreation activities. BNP was established with the intention of allowing the public to experience a marine ecosystem they otherwise would not be able to; however, the local visitors recreating out in the water were mostly white, male, and of higher income classes. Lack of resources to invest in boats and sophisticated gear may be a substantial limiting factor to inquiry-guided activities.

BNP could increase outreach efforts to these populations by diversifying their publicity in order to reach a wider variety of the local public. Such an effort could increase support for BNP, improving local use and knowledge of park resources. It would be difficult for BNP to obtain the appropriate resources to increase outreach in this way. In addition, these segments of the local population may also not be the most important for BNP management to cater to and invest resources in. Management would need to determine what would best serve the park and surrounding community in the long-term.

5.2.6 Community-building and collaboration

Management can address the diverging perspectives locals hold of BNP's mission and role through increased collaboration with the park's local community. Greater efforts in local collaboration can also improve local knowledge of BNP's resources. As illustrated in Chapter 1, the opportunity of long-term community-building can foster a reciprocal relationship between BNP management and its neighboring community. Reaching beyond the NEPA regulations in this way could improve local support for BNP, increase resource stewardship, and serve to strengthen the other five opportunities (Fig. 5.1).

Building relationships through increased dialogue and an open forum would allow BNP to be one of the few national parks progressing towards increased availability to local constituents. Management and staff alike could actively build local relationships and work to understand community goals in order to align them with BNP's goals. BNP can work to incorporate community perspective and needs into management decisions and regulations. This will require listening to communities to make informed decisions rather telling them about decisions already made, as the NEPA process does.

An effort similar to that of Yosemite National Park (Lever and Gilles, 2008) at BNP would be effective in strengthening the park's relationship with its community (see Chapter 1). Such an effort would include: appointing a community liaison, holding monthly planning open houses to keep community members involved in management decisions, and encouraging park employees to participate in civic associations and community

organizations. Multi-day workshops with community members and leaders could be incorporated in order to discuss the current socioeconomic climate, resource use and dependence by rural residents, and many other conservation and educational topics. Lastly, offering monthly or quarterly “behind the scenes” tours of BNP would allow the goals of management and communities to be further aligned. The tours would also act as a forum to introduce non-traditional and under-represented groups to BNP (Lever and Gilles, 2008).

BNP could carry out a training course for employees on the current behavior and perspectives of local visitors. This would make park employees aware of locals’ use and perspectives (Leong et al., 2009). In order to facilitate an open relationship with community members, staff training in “transparency” is also necessary. This would provide comprehensive, accurate, and unbiased information to the park’s public (Leong et al., 2009).

Effective collaboration with BNP’s community could also help management limit resource degradation, resource use conflicts, resentment, and deviant behavior in a different way than the aforementioned opportunities (Fig. 5.1). Environmental stewardship is a main goal of BNP programs—from Family Fun Fest to student camping trips—however, these programs do not reach certain segments of the local population. Community collaboration can increase education and resource awareness among local users because of its capability to foster ownership, responsibility, understanding, and stewardship (Barr, 2001; Leong et al., 2009; Lever and Gilles, 2008).

There is a disconnect between many local visitors’ use of BNP and their awareness of park resources. Many local visitors lack knowledge about the park’s resources and

environmental issues in general. What may be the case in Biscayne and throughout the country is that the public does not have a basic knowledge of science and their environment. With the recent growth in Hispanic immigration and an ever-diversifying population in south Florida, the educational background of BNP's community is also varied, dynamic, and may not always align with responsible interactions with park resources. The park does offer a substantial numbers of programs, services, classes, and events to inform the public of its natural resources, but these are apparently not entirely effective.

National Parks cannot change the education system, but by encouraging a sense of community ownership may slowly be able to influence public education in another way. BNP could strengthen its role as an exponent of environmental ethics through community-building. Initiatives to build relationships, learn about community issues, and empower citizens to influence decisions create a sense of stewardship among local residents (Leong et al., 2009).

Specific recommendations to build national parks' roles in the local community and as educational institutions include: local advisory committees, increased volunteer opportunities, increased outreach and education, and collaborative management (e.g. community partnerships, NGOs, and similar agencies) (Barr, 2001; Chess and Purcell, 1999; National Parks Conservation Association, 2006). A report released by the NPCA also recommends more Junior Ranger programs for local public and regular public meetings. BNP management is active in the park's local community in many of these ways (see

Chapter 2); however, they can increase the amount and effectiveness of outreach and work to establish frequent public meetings.

Resource limitations would likely again be a constraint on BNP adoption of the community building model. Successful and sustainable community collaboration projects require a much greater time investment than the other management opportunities described. Institutional challenges also exist. Generally, an agency-wide commitment is necessary to sustain such project. While working with the local community in this way takes time, money, and staff support, participating parks have seen that the benefits accrued outweigh the costs (Barr, 2001).

5.3 Conclusion

Throughout the world there are examples of contentious relationships between local communities and protected areas. As with BNP, the best way to preserve important natural resources may be to protect them from certain uses. This leads to conflict with local communities, especially when they depend on the previously unprotected land. The US model of national park management and its dual mission complicates the park-people relationship more in the way parks are federally managed and open to all public. Often, the local voice of these national symbols is not heard.

The established process for public inclusion in US national park management is not as effective as it could be. Planning and management remain insular and top-down, which are two reasons for current management challenges throughout the nation (e.g., use conflicts,

development pressures, etc.). Current management may be more efficient but is less effective than continuous community collaboration in how it leads to hindrances in long-term sustainability.

The purpose of the case study at BNP was to examine the relationship between Biscayne National Park and local visitors, in the context of community participation in US National Park planning and management. Results revealed the complexities of local community and natural resource interactions but also highlighted the need for a local foundation in park planning. Community collaboration cannot appease all sides but works to build trust and the health of both the community and resources.

Certain barriers do exist to successful community collaboration. The NPS institutional structure certainly makes regulating use and zoning an easier and more feasible option to protect natural resources. This form of management does not necessarily build a trusting relationship with local users. Lack of resources can also constrain the feasibility of effective community-building; however more collaborative park management strategies are favored worldwide for their foresight.

Taking the lead from the modern trend of “act local”, community collaboration in national parks can build lasting and trusting park-people relationships beginning with those who are most affected by park management. BNP has an opportunity to community-build while maintaining its symbol as a national treasure and protecting important natural resources.

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APPENDICES

Appendix I

Map of the US National Park System (Harper's Ferry Center, 2009)



Appendix II
Key Informant Interview Pro Forma

Identifier: _____

Study Title: *A park at their doorstep: Understanding how local communities use and perceive Biscayne National Park*

Primary Investigator: Bryanne Senor, Department of Forestry and Environmental Resources

Summary: In order to gain factual information about the use of Biscayne National Park (BNP), I will consult with key informants such as Park staff (Chief Interpretation Ranger, Environmental Education Coordinator, etc.) and staff members of non-profit organizations (e.g., South Florida National Parks Trust, The Nature Conservancy, etc.) that support the Park. My contact with them will be both formal (scheduled meetings) and informal (conversation during a program). I will ask these informants for background information on Biscayne National Park's natural and built resources, activities supported within the park, and observed trends in park use by local residents of Miami-Dade County.

Questions: The following questions are general, and may be asked as appropriate in the context of open-ended interviews.

- 1) Can you describe the area surrounding BNP when it was established?
 - a) Has this changed?
 - b) If yes, how do you perceive the changes?
- 2) Have you observed any changes in BNP's natural resources since then?
 - a) If so, what have you observed about the conditions, and how do you perceive the changes to have taken place?
- 3) Can you describe the primary uses of the Park in the timeframe we're discussing?
- 4) Have you observed any changes how the buildings and infrastructure have been managed and used? (i.e., visitor centers, concessions, etc.)

- 5) Currently, what are your observations about the primary uses of BNP?
 - a) Have you observed any trends among local community users? (i.e., how they have been using the Park over time and space?)
- 6) What are your perceptions about local users of BNP in terms of BNP's and National Parks Service's mission?
- 7) Do you have any guidance on when, where, and who might provide other background or contextual information on the BNP?

Appendix III
IRB Approved Informed Consent Form for Key Informants

**North Carolina State University
INFORMED CONSENT FORM for RESEARCH**

Title of Study

A park at their doorstep: Understanding how local communities use and perceive Biscayne National Park

Principal Investigator Bryanne Senior
Sarah T. Warren

Faculty Sponsor (if applicable)

What are some general things you should know about research studies?

You are being asked to take part in a research study. Your participation in this study is voluntary. You have the right to be a part of this study, to choose not to participate or to stop participating at any time. The purpose of this study is to gain a better understanding of Biscayne National Park use by local visitors. You are not guaranteed any personal benefits from being in a study. In this consent form you will find specific details about the research in which you are being asked to participate. If you do not understand something in this form it is your right to ask the researcher for clarification or more information. A copy of this consent form will be provided to you. If at any time you have questions about your participation, do not hesitate to contact the researcher(s) named above.

What is the purpose of this study?

The purpose of this study is to investigate observed trends in visitor use of Biscayne National Park by, especially by members of local communities in Homestead, FL. I am consulting you as a key informant in order to gain factual information about the use of the Park.

What will happen if you take part in the study?

If you agree to participate in this study, you will be asked to provide information about background information on Biscayne National Park's resources, activities within the park, and observed trends in park use by local residents of Miami-Dade County. Your information will be entirely confidential, and there will be no way in which anyone could identify you or connect your information to you. I will take notes to record your responses; you may see the notes at any time during the conversation. Some of the questions may be very short; for others, you may want to provide much information. Please feel free to bring up any issues about Biscayne National Park that might not be part of the interview. You may end the interview at any time.

Risks

There are no foreseeable risks associated with participating in this study.

Benefits

You will receive no direct benefit from participation in this study. However, you may receive indirect benefits by knowing that your information contributes to current and future management decisions in Biscayne National Park. You will also be contributing to the body of knowledge about management of National Parks.

Confidentiality

The information in the study records will be kept strictly confidential. Data will be stored securely in

locked cabinets in my faculty sponsor's office. I will assign unique number immediately so that your name cannot be linked to the information you provide. No reference will be made in oral or written reports which could link you to the study. You will NOT be asked to write your name on any study materials so that no one can match your identity to the answers that you provide.

Compensation

No compensation is offered for your participation.

What if you have questions about this study?

If you have questions at any time about the study or the procedures, you may contact the researcher, Bryanne Senor, at 104 Biscayne Inlet, Homestead, FL 33033, 919-931-6342, or blsenor@ncsu.edu.

What if you have questions about your rights as a research participant?

If you feel you have not been treated according to the descriptions in this form, or your rights as a participant in research have been violated during the course of this project, you may contact Deb Paxton, Regulatory Compliance Administrator, Box 7514, NCSU Campus (919/515-4514).

Consent To Participate

"I have read and understand the above information. I have received a copy of this form. I agree to participate in this study with the understanding that I may withdraw at any time."

Subject's signature _____ **Date** _____
Investigator's signature _____ **Date** _____

Appendix IV
Primary Respondent Interview Protocol

I will conduct semi-structured interviews with local park visitors, based on the following protocol. The semi-structured format will ensure that respondents have the opportunity to provide rich and complete information, more so than a structured process might preclude. Questions to be covered are organized according to research objectives; however, they will not necessarily be asked in this order. I will take notes that will be freely available to the respondent at the time of the interview. I will also give the respondents an opportunity to decide if they feel comfortable with a taped interview; if they are not, I will only take notes.

Introduction [5 min]

- 1) Introduce myself and the purpose of the study.
- 2) Present the approved consent form to the respondent.
- 3) Make the respondent aware of the duration of the interview and discuss any time Constraints.

Demographic information [3 min]

- 1) Age range, choose from list:
 - 18-21
 - 22-30
 - 31-40
 - 41-50
 - 51-60
 - 61 or Over
- 2) Race/ethnicity, choose from list:
 - African-American
 - Asian
 - Pacific Islander
 - Hispanic
 - Native American
 - White
- 3) First language_____
- 4) Level of education attainment, choose from:
 - Less than high school
 - High school/GED
 - Some college

- 2-year college degree (Associates)
 - 4-year college degree (BA, BS)
 - Graduate degree (MS, PhD)
- 5) Income class, choose from:
- Less than \$20,000
 - \$20,000-29,999
 - \$30,000-39,999
 - \$40,000-49,999
 - \$50,000-59,000
 - More than \$60,000
- 6) Describe proximity to park, based on town of residence and estimated mileage from BNP_____
- 7) Length of residence in Miami-Dade County_____
- 8) Number of children under the age of 18_____
- 9) Boat, SCUBA/PADI, or other water equipment ownership_____

Awareness of BNP [3 min]

- 1) Can you locate BNP on this map? (Show respondent a map of Florida)_____
- 2) Would you please tell me what a National Park means to you? (Potential prompts: recreation, resources, conservation)
- 3) What do you think BNP's mission really is?

Visitation Habits [5 min]

- 1) Have you visited BNP before?_____
 - a. If yes, for how long have you been visiting BNP?_____
- 2) About how much time each month do you spend on recreation activities? Choose from:
 - Less than 1 day per month
 - At least 1 day per month
 - At least 2 days per month
 - At least 3 days per month
 - At least 4 days per month
 - More than 4 days per month
- 3) How much of that time would you say you spend in BNP? Choose from:
 - Less than 1 day per month
 - At least 1 day per month

- At least 2 days per month
 - At least 3 days per month
 - At least 4 days per month
 - More than 4 days per month
- 4) In what season do you normally visit BNP? _____
- 5) What is your primary use of park today?
- 6) Can you name the top three activities you use BNP for?
- a. For those supervising children under 18, what are their top three activities?
- 7) If you could only do one activity today, what would it be?

Motivation(s) for Visitation [3 min]

- 1) Could you describe the primary reason(s) why you visit BNP?

Importance Value of BNP Activities and Resources [8 min]

- 1) Please rank the importance to you of the following park **activity** options, from very important to not important.

Activity	Very Imp	Imp	Somewhat Imp	Not very Imp	Not Imp
Boating (non-motor; i.e. kayaking, peddle boats, etc.)	5	4	3	2	1
Boating (motor)	5	4	3	2	1
Camping	5	4	3	2	1
Fishing	5	4	3	2	1
Boat tour	5	4	3	2	1
Picnicking	5	4	3	2	1
SCUBA diving	5	4	3	2	1
Snorkeling	5	4	3	2	1
Swimming	5	4	3	2	1
Wildlife viewing	5	4	3	2	1
Other	5	4	3	2	1

2) Are you able to identify any natural resource(s) within BNP? Could you name it/them?

- a. Can you describe any importance for this/these resource(s)?
- b. Can you think of any potential threats to this/these resource(s)?

3) Please rank the importance to you of the following park **natural resources** from very important to not important.

Resource	Very Imp	Imp	Somewhat Imp	Not very Imp	Not Imp
Biscayne Bay	5	4	3	2	1
Coral Reef	5	4	3	2	1
Keys (islands)	5	4	3	2	1
Mangroves	5	4	3	2	1
Wildlife	5	4	3	2	1

4) Please rank the importance to you of the following park **quality or condition** from very important to not important.

Quality or Condition	Very Imp	Imp	Somewhat Imp	Not very Imp	Not Imp
Water quality	5	4	3	2	1
Shoreline protection	5	4	3	2	1
Biological diversity	5	4	3	2	1
Nursery habitat for young animals	5	4	3	2	1
Fish and lobster stocks	5	4	3	2	1
Aesthetics (scenic views, clean environment, etc.)	5	4	3	2	1
Noise level	5	4	3	2	1
Crowds	5	4	3	2	1

Conclusion [2 min]

- 1) Thank the respondent for their time.
- 2) Inform the respondent about the intended results of the study.

Appendix V
IRB Application Packet

Revised February 3, 2009

**North Carolina State University
Institutional Review Board for the Use of Human Subjects in Research**

GENERAL INFORMATION

1. Date Submitted: <u>04/21/2009</u>
1a. Revised Date:
2. Title of Project: <i>A park at their doorstep: Understanding how local communities use and perceive Biscayne National Park</i>
3. Principal Investigator: Bryanne Senor
4. Department: <u>Forestry and Environmental Resources</u>
5. Campus Box Number:
6. Email: <u>blsenor@ncsu.edu</u>
7. Phone Number: <u>919-931-6342</u>
8. Fax Number:
9. Faculty Sponsor Name and Email Address if Student Submission: Sarah Warren, Sarah_warren@ncsu.edu
10. Source of Funding? (required information): Internal funding (RA income/faculty assistance) and in-kind funds from Biscayne National Park (50% of housing costs)
11. Is this research receiving federal funding?: <u>No</u>
12. If Externally funded, include sponsor name and university account number: <u>n/a</u>
13. RANK: <input type="checkbox"/> Faculty <input checked="" type="checkbox"/> Student: <input type="checkbox"/> Undergraduate; <input checked="" type="checkbox"/> Masters; or <input type="checkbox"/> PhD <input type="checkbox"/> Other (specify): _____

As the principal investigator, my signature testifies that I have read and understood the University Policy and Procedures for the Use of Human Subjects in Research. I assure the Committee that all procedures performed under this project will be conducted exactly as outlined in the Proposal Narrative and that any modification to this protocol will be submitted to the Committee in the form of an amendment for its approval prior to implementation.

Principal Investigator:

Bryanne Senor _____ *

(typed/printed name) (signature)

*As the faculty sponsor, my signature testifies that I have reviewed this application thoroughly and will oversee the research in its entirety. I hereby acknowledge my role as the **principal investigator of record**.*

Faculty Sponsor:

Sarah T. Warren _____*
(typed/printed name) (signature)

***Electronic submissions to the IRB are considered signed via an electronic signature. For student submissions this means that the faculty sponsor has reviewed the proposal prior to it being submitted and is copied on the submission.**

Please complete this application and email as an attachment to: joe_rabiega@ncsu.edu or send by mail to: Institutional Review Board, Box 7514, NCSU Campus (Administrative Services III). **Please include consent forms and other study documents with your application and submit as one document.**

For SPARCS office use only

Reviewer Decision (Expedited or Exempt Review)

Exempt Approved Approved pending modifications Table

Expedited Review Category: 1 2 3 4 5 6 7 8a 8b 8c
 9

Reviewer Name Signature Date
**North Carolina State University
Institutional Review Board for the Use of Human Subjects in Research
GUIDELINES FOR A PROPOSAL NARRATIVE**

In your narrative, address each of the topics outlined below. Every application for IRB review must contain a proposal narrative, and failure to follow these directions will result in delays in reviewing/processing the protocol.

A. INTRODUCTION

1. Briefly describe in lay language the purpose of the proposed research and why it is important.

The purpose of this study is to investigate trends among local communities' uses of Biscayne National Park in Homestead, FL. Local community and other park visitors seem to have altered their primary uses of Biscayne National Park over the past decade. Local users may lack awareness of one of Biscayne's essential resources, the coral reef. In the past, primary park uses were for fishing, snorkeling, and SCUBA diving. Now it appears that the majority of park visitors focus on sports and beach gatherings rather than on marine resources. This places greater pressure on important island habitat and on the mainland portions of the park. Using qualitative and quantitative research methods, I will collect data on local visitor perspectives, priorities, demographics and park use trends. The results of this study will inform Biscayne National Park's management decisions, aid in the revision of their General Management Plan, and assist park managers as they approach the National Park Service's Centennial Initiatives.

2. If student research, indicate whether for a course, thesis, dissertation, or independent research.

This study will serve as the basis for a Forestry master's thesis in the Department of Forestry and Environmental Resources.

B. SUBJECT POPULATION

1. How many subjects will be involved in the research?

A minimum of 20 respondents will be interviewed. Use of a snowball sampling approach may result in up to 50 interviews. Park managers, park-focused NGO representatives, and local business owners will serve as key informants.

2. Describe how subjects will be recruited. Please provide the IRB with any recruitment materials that will be used.

The interviewer will approach users on site and inquire about willingness to participate. No recruitment materials will be used.

3. List specific eligibility requirements for subjects (or describe screening procedures), including those criteria that would exclude otherwise acceptable subjects.

Eligible subjects are local park visitors, residents of Miami-Dade County, above the age of 18 who are engaging in recreational activities within the Biscayne National Park.

4. Explain any sampling procedure that might exclude specific populations.

Visitors who are not residents of Miami-Dade County will be excluded because the study specifically focuses on the local community.

5. Disclose any relationship between researcher and subjects - such as, teacher/student; employer/employee.

None

6. Check any vulnerable populations included in study:

- minors (under age 18) - if so, have you included a line on the consent form for the parent/guardian signature
- fetuses
- pregnant women
- persons with mental, psychiatric or emotional disabilities
- persons with physical disabilities
- economically or educationally disadvantaged
- prisoners
- elderly
- students from a class taught by principal investigator
- other vulnerable population.

7. If any of the above are used, state the necessity for doing so. Please indicate the approximate age range of the minors to be involved.

No vulnerable populations are included in the sample. Minors will be excluded from involvement.

C. PROCEDURES TO BE FOLLOWED

1. In lay language, describe completely all procedures to be followed during the course of the experimentation. Provide sufficient detail so that the Committee is able to assess potential risks to human subjects. In order for the IRB to completely understand the experience of the subjects in your project, please provide a detailed outline of everything subjects will experience as a result of participating in your project. Please be specific and include information on all aspects of the research, through subject recruitment and ending when the subject's role in the project is complete. All descriptions should include the informed consent process, interactions between the subjects and the researcher, and any tasks, tests, etc. that involve subjects. If the project involves more than one group of subjects (e.g. teachers and students, employees and supervisors), please make sure to provide descriptions for each subject group.

I will approach respondents engaged in recreational activities within the Park, requesting their participation in the research. I will determine eligibility by first asking the potential respondent's place of residence. I will explain the informed consent form, and provide one copy for the respondent, assuring them that their information will not be shared unless aggregated with that of other respondents. I will introduce myself, explain the purpose of the study, and describe how their participation in it will contribute to it. I will request permission to tape the interview, and will tape only if the respondent is comfortable. Otherwise, I will take notes. In either instance, all answers will be available for the respondent to review at the time of the interview. The interview will include structured, semi-structured, and open-ended questions. There are no tasks or tests required. If the respondent presents a line of discussion that is not in the attached protocol, I will follow it as they permit. All questions will be explained orally. I will also provide cue cards for questions that require use of scales or collection of quantitative data. Following completion of the interview, I will again assure respondents of confidentiality procedures.

2. How much time will be required of each subject?

Between 20 and 30 minutes.

D. POTENTIAL RISKS

1. State the potential risks (physical, psychological, financial, social, legal or other) connected with the proposed procedures and explain the steps taken to minimize these risks.

There are no foreseen potential risks.

2. Will there be a request for information that subjects might consider to be personal or sensitive (e.g. private behavior, economic status, sexual issues, religious beliefs, or other matters that if made public might impair their self-esteem or reputation or could reasonably place the subjects at risk of criminal or civil liability)?

Yes. Respondents are not required to provide their economic status, but may decide to indicate economic status within a range of annual income levels. No other questions might be considered personal or sensitive.

a. If yes, please describe and explain the steps taken to minimize these risks.

Six different annual income ranges will be presented (starting at less than \$20,000 and increasing by \$10,000 increments up to \$60,000). Respondents will be informed that their participation remains valid without income information.

b. Could any of the study procedures produce stress or anxiety, or be considered offensive, threatening, or degrading? If yes, please describe why they are important and what arrangements have been made for handling an emotional reaction from the subject.

No.

3. How will data be recorded and stored?

Interview notes will be transcribed. If tape recording is allowed, interviews will be transcribed. Transcriptions and tapes will be stored in the faculty sponsor's office, in a locked cabinet. Informed consent forms will be stored separately in a locked cabinet in the faculty sponsor's office.

a. How will identifiers be used in study notes and other materials?

Each respondent will be identified using a unique number.

b. How will reports will be written, in aggregate terms, or will individual responses be described?

All quantitative information will be aggregated. Qualitative data will be coded in aggregate terms. No response will be attributable to any single respondent. Information supplied by key informants Will be attributable only to organization type (e.g., park staff, NGO representative).

4. If audio or videotaping is done how will the tapes be stored and how/when will the tapes be destroyed at the conclusion of the study.

Tapes will be erased when the transcription is complete and has been checked twice by the investigator.

5. Is there any deception of the human subjects involved in this study? If yes, please describe why it is necessary and describe the debriefing procedures that have been arranged.

No.

E. POTENTIAL BENEFITS

This does not include any form of compensation for participation.

1. What, if any, direct benefit is to be gained by the subject? If no direct benefit is expected, but indirect benefit may be expected (knowledge may be gained that could help others), please explain.

The only benefit to respondents is indirect. Respondents will be informed that the information they provide will be of assistance to managers of the Biscayne National Park and to the National Park Service.

F. COMPENSATION

Please keep in mind that the logistics of providing compensation to your subjects (e.g., if your business office requires names of subjects who received compensation) may compromise anonymity or complicate confidentiality protections. If, while arranging for subject compensation, you must make changes to the anonymity or confidentiality provisions for your research, you must contact the IRB office prior to implementing those changes.

1. Explain compensation provisions if the subject withdraws prior to completion of the study.

Subjects will not be compensated. If a subject withdraws prior to completion of the interview portion of the study, there is no penalty.

2. If class credit will be given, list the amount and alternative ways to earn the same amount of credit.

No class credit.

G. COLLABORATORS

1. If you anticipate that additional investigators (other than those named on **Cover Page**) may be involved in this research, list them here indicating their institution, department and phone number.

No other investigators are involved in this study.

2. Will anyone besides the PI or the research team have access to the data (including completed surveys) from the moment they are collected until they are destroyed.

No.

H. CONFLICT OF INTEREST

1. Do you have a significant financial interest or other conflict of interest in the sponsor of this project? No
2. Does your current conflicts of interest management plan include this relationship and is it being properly followed? N/A

I. ADDITIONAL INFORMATION

1. If a questionnaire, survey or interview instrument is to be used, attach a copy to this proposal.
Please see attached.
2. Attach a copy of the informed consent form to this proposal.
3. Please provide any additional materials that may aid the IRB in making its decision.

J. HUMAN SUBJECT ETHICS TRAINING

*Please consider taking the [Collaborative Institutional Training Initiative](#) (CITI), a free, comprehensive ethics training program for researchers conducting research with human subjects. Just click on the underlined link.

Appendix VI
IRB Approved Informed Consent Form for Primary Respondents

**North Carolina State University
INFORMED CONSENT FORM for RESEARCH**

Title of Study

A park at their doorstep: Understanding how local communities use and perceive Biscayne National Park

Principal Investigator Bryanne Senior
Sarah T. Warren

Faculty Sponsor (if applicable)

What are some general things you should know about research studies?

You are being asked to take part in a research study. Your participation in this study is voluntary. You have the right to be a part of this study, to choose not to participate or to stop participating at any time. The purpose of this study is to gain a better understanding of Biscayne National Park use by local visitors. You are not guaranteed any personal benefits from being in a study. In this consent form you will find specific details about the research in which you are being asked to participate. If you do not understand something in this form it is your right to ask the researcher for clarification or more information. A copy of this consent form will be provided to you. If at any time you have questions about your participation, do not hesitate to contact the researcher(s) named above.

What is the purpose of this study?

The purpose of this study is to investigate observed trends in visitor use of Biscayne National Park by, especially by members of local communities in Homestead, FL. Using mixed methods, we wish to discover information that will be of use by the National Park Service and particularly the managers of Biscayne National Park. The information you provide will help in the management of the Park. It can be incorporated into the General Management Plan currently being revised, and help the Park reach the goals of the National Park Service's Centennial Initiatives.

What will happen if you take part in the study?

If you agree to participate in this study, you will be asked to provide information about how you use Biscayne National Park. Your information will be entirely confidential, and there will be no way in which anyone could identify you or connect your information to you. If you choose not to answer some questions, that will not influence any other information you might provide. You may decide if you feel comfortable if I tape your responses. If you do not wish to have your responses taped, I will take notes. You may see the notes or listen to the tape at any time during the interview. Some of the questions may be very short; for others, you may want to provide much information. Please feel free to bring up any issues about use of Biscayne National Park that might not be part of the interview. You may end the interview at any time. I expect the interview to take between 20 to 30 minutes as your time permits.

Risks

There are no foreseeable risks associated with participating in this study.

Benefits

You will receive no direct benefit from participation in this study. However, you may receive indirect benefits by knowing that your information contributes to current and future management decisions in Biscayne National Park. You will also be contributing to the body of knowledge about management of National Parks.

Confidentiality

The information in the study records will be kept strictly confidential. Data will be stored securely in locked cabinets in my faculty sponsor’s office. Tape recordings will be erased as soon as transcriptions are completed. I will assign unique number immediately so that your name cannot be linked to the information you provide. No reference will be made in oral or written reports which could link you to the study. You will NOT be asked to write your name on any study materials so that no one can match your identity to the answers that you provide.

Compensation

No compensation is offered for your participation.

What if you have questions about this study?

If you have questions at any time about the study or the procedures, you may contact the researcher, Bryanne Senor, at 104 Biscayne Inlet, Homestead, FL 33033, 919-931-6342, or blsenor@ncsu.edu.

What if you have questions about your rights as a research participant?

If you feel you have not been treated according to the descriptions in this form, or your rights as a participant in research have been violated during the course of this project, you may contact Deb Paxton, Regulatory Compliance Administrator, Box 7514, NCSU Campus (919/515-4514).

Consent To Participate

“I have read and understand the above information. I have received a copy of this form. I agree to participate in this study with the understanding that I may withdraw at any time.”

Subject's signature _____ **Date** _____
Investigator's signature _____ **Date** _____

Appendix VII
IRB Approval and Exemption

North Carolina State University is a land- grant university and a constituent institution of The University of North Carolina

Office of Research and Graduate Studies

NC STATE UNIVERSITY

Sponsored
Programs
and

Regulatory Compliance

Campus Box 7514

2701 Sullivan Drive

Raleigh, NC 27695-7514

919.515.2444

919.515.7721 (fax)

From: Debra Paxton, IRB Administrator
North Carolina State University
Institutional Review Board

Date: May 14, 2009

Project Title: A Park at Their Doorstep: Understanding how Local Communities Use
and Perceive Biscayne National Park

IRB#: 932-09-4

Dear Ms. Senor:

The research proposal named above has received administrative review and has been approved as exempt from the policy as outlined in the Code of Federal Regulations (Exemption: 46.101.b.2). Provided that the only participation of the subjects is as

described in the proposal narrative, this project is exempt from further review.

NOTE:

1. This committee complies with requirements found in Title 45 part 46 of The Code of Federal Regulations. For NCSU projects, the Assurance Number is: FWA00003429.
2. Any changes to the research must be submitted and approved by the IRB prior to implementation.
3. If any unanticipated problems occur, they must be reported to the IRB office within 5 business days.

Sincerely,



Deb Paxton
NCSU IRB