

ECOLOGDE EXPLORATION:

A projective design for the Flamingo district
in the Everglades National Park

by

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A REPORT

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ABSTRACT

Nature based tourism is a growing trend across the world today. Ecotourism is a specific nature based tourism type, defined by the International Ecotourism Society (TIES) as “Responsible travel to natural areas that conserves the environment and improves the well-being of local people.” The ‘ecolodge,’ is a term that refers to the site and structure where ecotourists stay and where ecotourism activities occur. The intention of an ecolodge is to find a balance between three factors: conservation, local communities, and interpretation for travelers and workers. Every ecolodge is unique in form and function to uphold sustainability best practices and to meet specific environmental and climatic needs of a region. As more and more tourists choose to travel to environmentally sensitive areas of the world, ecolodge use must increase in order to preserve environmental and cultural assets (Honey, 2008).

In other countries, like Costa Rica and Kenya, many ecolodges have successfully balanced these three components creating an overall trend towards ecolodges and ecotourism operations, shifting away from traditional accommodation types. However, as the U.S. tourism market continues to grow, there is yet to be a notable ecolodge presence. Some ecotourism experts would argue that true ecotourism—equally finding balance between conservation, guest interpretation, and community support—will never be possible to create in the U.S. Many believe it is the ‘supporting local communities’

aspect of ecotourism which cannot be met. The treatment of indigenous people, as well as the structure of the nation’s economy in the U.S. is different compared to developing countries where ecolodge design has found success.

Interestingly, certified sustainable site development is becoming prevalent in the U.S. Frameworks such as LEED and SITES® are used to improve the rigor of sustainability design. Design guidelines for ecolodges share similar goals with LEED and SITES®. But ecolodge design is not prevalent in the U.S. This may be due to the lack of an international ecolodge certification system. If the ecotourism industry can progress from ecolodge guidelines (which are largely unknown) to an international ecolodge certification, truly authentic ecolodges will become the standard (Mehta, 2007).

To explore how ecolodges can be used in a U.S. National Park, this project focuses on the Flamingo District in the Everglades National Park, Florida. A projective design methodology is used. The data collection methods include precedent studies, interviews, on-site observation, and site analysis.

Flamingo, located in the southernmost point of the Everglades was destroyed by hurricane Katrina in 2005. The National Park Service is seeking a business concessioner to 1) oversee the construction of new lodging area, and 2) operate all business activities—recreation rentals, marina operations, general store, and dining—in the district. The goal of this research project is to create an ecolodge design that can serve Flamingo’s needs and serve as a model for future ecolodge design in U.S. National Parks.

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FIGURE 1.0: Flamingo NPS Visitor Center (Steward, 2017)

01

INTRODUCTION

PROJECT DEFINITION

1.1 UNDERLYING PROBLEM: LACK OF COHESION COHESION BETWEEN ECOTOURISM & NPS

The underlying concept of ecotourism and the underlying mission of the National Park Service are strikingly similar. In 1916 President Woodrow Wilson signed the Organic Act creating the National Park Service stating:

“...the fundamental purpose of said parks... is to conserve the scenery and the natural and historic objects and the wildlife therein...and to leave them unimpaired for the enjoyment of future generations” (NPS, 2017).

Martha Honey, journalist, ecotourism expert, and author, claims ecotourism is a way to:

“fund conservation and scientific research, protect fragile and pristine ecosystems, benefit rural communities, promote development in poor countries, enhance ecological and cultural sensitivity, instill environmental awareness and a social conscience in the travel industry” (Honey, 1999, 4).

Despite the similar goals to conserve and protect the environment as well as human rights, the National Park System and Ecotourism are not yet familiar with one another. The U.S. has been slow to accept ecotourism and have not yet implemented ecolodge

facilities on native soil. As the U.S. tourism industry, global climate change, and resulting intensified natural disaster events are all predicted to increase, the need for sustainable tourism and sustainable site development is greater than ever before—in the U.S. as well as developing countries. Although new development projects are relatively few in America’s National Parks today, there is an opportunity for these few projects to apply modern sustainable development practices and ecotourism principles. National Parks provide perhaps the strongest setting for people to develop an appreciation for nature and a sense of responsibility to the environment. Therefore, the built environment in National Parks should be the ultimate reflection of this idea.

1.2 PROJECT CONTEXT: FLAMINGO NEEDS A LODGE!

The Flamingo District in Everglades National Park, Florida is the site for this master’s project. Located in the southernmost point of the Everglades National Park, the site was severely damaged by Hurricane Katrina in 2005. The original 1958 lodging facility was destroyed and has yet to be rebuilt. Improvements to the district are being called for. The Everglades Park service is now seeking a business concessioner to:

1) oversee the construction of new lodging and recre-

ation areas; and, 2) operate all business activities—recreation rentals, marina operations, general store, and dining—in the district. The Everglades National Park home to a wetland environment unlike any other in the world is visited by more than 180,000 people per year and is expected to see visitation increases in the future. Restoring visitor lodging facilities at the Flamingo District is clearly a need for the Flamingo District. This development need creates a chief opportunity to marry the principles of ecotourism and sustainable site design within the National Park setting. A sustainable ecolodge site design developed through this project is hoped to be a resource and reference for Flamingo's future selected business concessioner. These final products can also serve as an example of ecolodge development for future NPS tourism projects.

1.3 PROJECT OUTLINE & PURPOSE:

STRENGTHENING THE AMERICAN ECOLODGE

The sustainable ecolodge site design presented at the end of this project can bring value to the Flamingo district by creating a more memorable experience of the built environment for park visitors, and intervene on the land in a more sustainable and ecofriendly manner. This project can be used for idea generation, inspiration, and guidance for the future concessioner of Flamingo. Hopefully this project can make Flamingo's future concessioner pause to consider sustainable

development alternatives opposed to standard or traditional construction methods and design as they move forward with the rebuilding of Flamingo's lodge.

GOALS OF THIS PROJECT:

1. Use research, sustainable design strategies, and creative design, to show that an ecolodge can be appropriate for Everglades National Park.
2. Argue why ecolodge sites should be utilized more in the National Park System.

OBJECTIVES OF THE PROJECT:

1. Gain an understanding of ecotourism, ecolodge development, sustainable site design, and the American National Park Service
2. Investigate the Flamingo District and its lodge site in the Everglades National Park, and associated opportunities and constraints
3. Develop a sustainable ecolodge site design for the Flamingo District, Everglades National Park

RESEARCH QUESTION:

How can authentic ecolodge criteria and sustainable site design principles be adapted and applied to inform the design of an ecolodge at the Flamingo District in Everglades National Park?



FIGURE 2.0: Everglades Pines at Dusk (Steward, 2017)



02

BACKGROUND

BACKGROUND

The background, or literature review, chapter of this report is meant to develop the reader's understanding of the following five sections:

- Ecotourism
- The Ecolodge
- Sustainable Site Design
- Tourism in U.S. National Parks
- The Project Study Site

Within each section, key terms, existing principles, historical accounts, and central concepts are explored. It is important to develop substantial knowledge in all of these sections in order to identify and carry out the methods needed to collect data necessary to design an ecolodge for the Flamingo District in the Everglades National Park.



FIGURE 2.1: Literature Map
(Steward, 2017)

2.1 ECOTOURISM

WHAT IS ECOTOURISM? DEFINITIONS & THE EVOLUTION OF ECOTOURISM

Ecotourism as defined by The International Ecotourism Society (TIES) is “Responsible travel to natural areas that conserves the environment and improves the well-being of local people” (TIES, 2016). The concept of ecotourism has risen out of the environmental movement for sustainable development in the 1970s (TIES, 2016). Ecotourism was developed with inclusion, sustainability, and environmental ethics in mind. The intent of ecotourism is to meet the needs of today’s tourists and host locations while conserving and improving opportunities for the future (TIES, 2016). Ecotourism is a unique form of tourism with a specific set of principles. Often the term “ecotourism” is incorrectly used interchangeably with other closely related tourism types, like nature tourism, wildlife tourism, and adventure tourism; though all are determined by the type of recreation activities they include (Honey, 2008). Specifically nature tourism is defined as “travel to unspoiled places to experience and enjoy nature;” wildlife tourism is defined as “travel to observe animals, birds and fish in their natural habitats;” and, adventure tourism is defined as “travel requiring physical skill and endurance to engage in challenging nature activities” (Honey, 2008,

7). Ecotourism acts an umbrella to all these recreation tourism types, but must also include a broader agenda than recreation alone. People who participate in ecotourism as a tourist are travelers who seek a wide-range of activities, destination trips, and prefer intimate and often modest accommodations (Honey, 2008). These travelers have an interest in environmental and social issues, usually have diverse travel experience, and are typically more adventuresome than the conventional tourist (Honey, 2008). More about the motivations, demographics, and definitions of the ecotourist will be explored later.

In reviewing the literature on ecotourism, the popular ecotourism model includes three common dimensions: conservation, sustainable travel, and support of local communities (TIES, 2016). However, elaborations of the popular ecotourism model and additional dimensions do exist. David Weaver defines four dimensions of ecotourism in The Encyclopedia of Ecotourism. These dimensions (seen in FIGURE 2.1) are nature based, environmentally educated, sustainability managed, and are with small groups/personalized (Weaver, 2001, 7). By adding the fourth dimension, Weaver distinguishes popular (3 dimensions) from classical (4 dimensions) ecotourism. Small personalized group settings within ecotourism settings are certainly ideal

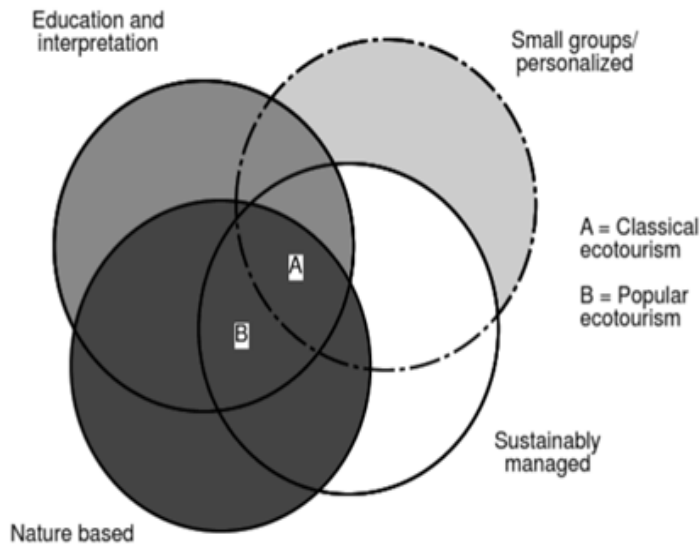


FIGURE 2.2: Ecotourism Components (Weaver, 2001).

for the traveler's experience, but may not always be feasible in operation. On the other hand, D.A. Fennell's definition of ecotourism from Ecotourism Programme Planning puts more weight in the natural history of a region than any of the other ecotourism components: "Its aim is to develop sustainability...[in order to] not intentionally stress living and non-living elements of the environments in which it occurs" (Fennell, 2002, 15).

It is clear that the topic of ecotourism is broad and difficult to limit to one single definition. In an attempt to further clarify the topic of ecotourism, the International

Ecotourism Society (TIES) has established seven principles of ecotourism:

1. *Involves travel to natural destinations.*
 2. *Minimizes impact.*
 3. *Builds environmental awareness*
 4. *Provides direct financial benefits for conservation*
 5. *Provides financial benefits and empowerment for local people.*
 6. *Respects local culture.*
 7. *Supports human rights and democratic movements.*
- (TIES, 2016)

From these principles it is apparent that ecotourism is more than travel to pristine natural areas for recreational activities.

NATURE BASED TOURISM V. ECOTOURISM

Nature-based tourism, which includes ecotourism, is the fastest growing sector of tourism estimating between 10% to 20% of annual international tourism expenses including: airfare, accommodations, ground transportation, food, and entertainment/activities (Ceballos-Lascurain, 2008). Nature-based tourism is extremely diverse and many more specific tourism types fall into the larger nature-based tourism category. Ecotourism and its associated activities like bird-watching, compared to adventure tourism involving activities like boating and backcountry skiing are both considered nature-based tourism (Pickering & Weaver, 2003). As pressures to expand tourist recreation

areas and accommodations increase, improved nature-based planning strategies are needed. One planning method for nature-based tourism involves computer mapping through geographical information systems or GIS. The approach is to combine the outputs from environmental-resiliency modeling and tourism-potential modeling (Arrowsmith, 2003). This kind of mapping will indicate where the most resilient land is, and within that area, where the most accessible and attractive areas are for tourists (Arrowsmith, 2003). The nature based tourism approach is similar to the ecotourism model as it seeks to conserve and protect nature while also providing an educational and enjoyable experience for the nature tourist. However, the matter of community and local people is not addressed in nature-based tourism. That is not to say that nature-based tourism projects are not considerate of the social environment that surrounds them.

THE ECOTOURIST

Naming a traveler who stays at an ecolodge and who and engages in ecotourism activities is a tricky task—few want to be called an ‘ecotourist’. “Both words [eco, and tourist] have deep-rooted objections within the psyche of those of us who travel, and thus within the marketplace” (Bryan, 2008, 94). In the U.S. most suppliers and tourism operators understand this, and tourists are referred to as the ‘responsible and informed traveler’ instead (Bryan, 2008). Types of ecotourists fall somewhere along a spectrum, which is determined by their nature-related interest and desires

for physical rigor. On the spectrum there are four basic tourist types:

- **Hard-core nature tourists.** Scientific researchers or members of tours specifically designed for education, removal of litter or similar purposes.
- **Dedicated nature tourists.** People who take trips specifically to see protected areas and who want to understand local natural and cultural history.
- **Mainstream nature tourists.** People who visit the Amazon, the Rwandan gorilla park, or other destinations primarily to take an unusual trip.
- **Casual Nature Tourists.** People who partake of nature incidentally as part of a broader trip. (Fennell, 2002, 17).

Ecotourists seeking recreation activities should be selective in choosing recreation companies or tours as not all are truly dedicated to protecting nature or benefiting local communities. When conducted and planned carelessly, recreation tourism especially, can be dangerously degrading to the environment. On public lands, recreation is claimed to be the second greatest threat to endangered species and animals (Bryan, 2008). In addition to tourism’s environmental impacts, ecotourists must be knowledgeable of and sensitive to the country’s political and social environments of which they are traveling to (Honey, 2005). Ecotourists must be critical and when traveling to new countries consider the question: will human rights be respected? (Honey, 2008).

BENEFITS OF AND NEEDS FOR ECOTOURISM

In the past, a 'benefit' (in terms of the tourism industry) is defined as an activity or program that results in an economic gain (Fennell, 2002). But within the sphere of ecotourism, the word 'benefit' has since expanded to "consider the impacts or effects which recreation and travel have had on individuals and groups, beyond the focus on economic efficiency" (Fennell, 2002, 20). For the tourist, benefits that come from ecotourism are great. The very word 'recreation' is defined as "activities done for enjoyment" (Merriam-Webster, 2016).

Ecotourism benefits to travelers can be measured using Driver's Recreation Experience Preference (REP) scales. These scales focus on outdoor recreation, and are particularly relevant to the ecotourist; 1) Enjoy nature, 2) Share Similar Values, 3) Outdoor Learning, 4) Escape Physical Stressors, 5) Achievement, and 6) Risk Reduction (Driver, 1983). In the popular three-part ecotourism model (tourists, local people, and environment) the tourism component is the most obvious area to receive benefits. The remaining two components of the ecotourism model—environment and local people—benefit as well when true ecotourism activities and programs are at work.

As one example in the Amazon rainforest, the importance of conservation of the natural environment, in the minds of local people, moved from that of an economical priority to a realization of their culture's utmost survival. "We never thought too much about

[conservation] when we first began, but [then realized] if we are going to continue as a culture, we need to actively protect and conserve our environment" (Borman, 2008, 24). An environmental benefit "maintains or improves or prevents degradation of the natural world" (Fennell, 2002, 22).

Benefits to the third part of the model, the environment, in turn trickle down to the environment's beneficiaries: humans, namely tourists and local people alike. Many environmental benefits, come from human actions; "life support benefits, aesthetic benefits, scientific benefits, historical benefits, endangered species/ecosystems, and religious/philosophical benefits" (Fennell, 2002, 22). As can be learned from studying ecology, everything in the natural world is connected and no one system can stand alone. It is important that each part of ecotourism's three part model benefits from an ecotourism program or site. If not, reevaluation is in order.

One of the largest issues facing humans and our future development on Earth is global warming and climate change. The tourism sector has undoubtedly been a major contributor to the causes of climate change, namely in its use of fossil fuels and emissions of CO₂ (Becken & Hay, 2007). In *Climate Change, Economies and Society, No. 1 : Tourism and Climate Change : Risks and Opportunities*, Becken and Hay expect tourism to increase and the number of international travelers to grow.

Becken and Hay's tourism industry projections are as follows:

- Economic factors will remain positive as global economic growth, information technology, and transportation technologies are expected to grow
- As a planet, congestion, delays, and safety will improve with technology. Barriers to international travel will be reduced
- In developed countries, the growing power of international economic and market forces will reduce the power of individual states and private corporations to dominate domestic markets
- Public awareness of environmental and sociocultural issues is expected to grow in coming years
- As the world population multiplies and urban areas become more dense, the desire to escape or indulge in tourism in natural areas will grow.

But unlike tourism predictions, the predictions for the environment in coming years are not so positive. For tourism, the culprit of greenhouse gas emissions lie in transportation and building energy use of fossil fuels (Becken & Hay, 2007). Whenever possible, the use of fossil fuels should be reduced or replaced with renewable energy sources, such as solar, hydropower, wind or biomass. Choosing to switch from the traditional methods of powering a tourism operation, to new sustainable alternatives is an ethical decision that aligns with three of the seven principles of ecotourism: "minimizes impact, builds environmental awareness, and supports human rights and democratic movements" (TIES, 2016).

CHALLENGES AND OPPORTUNITIES OF ECOTOURISM IN THE UNITED STATES

Although developed countries like the U.S. are interested and involved with ecotourism, it is in developing countries where ecotourism has been successful in creating opportunities for economic development and conservation strategies (Honey, 2008). This statement is reiterated in the book *Ecotourism and Conservation in the Americas* stating warmer climate, longer seasons, and inexpensive labor are the major contributors as to why ecotourism is more likely to occur in developing countries than in countries like the U.S. (Stronza & Durham, 2008). The inherent nature of tourism itself results in the exploitation of either natural resources, wildlife habitat, or local communities (Bryan, 2008). The common traveler's goal is to maximize fun and exploration while keeping the overall cost as cheap as possible. This thought process stems from Americans' learned behavior that "any form of outdoor recreation (particularly on public lands) should be done for free or nearly for free" (Bryan, 2008, 97). In smaller countries it is often more manageable to have nation-wide ecotourism standards. In Costa Rica for example, the certificate for sustainable tourism, 'turismo sostenible,' is used to certify tour companies and accommodations that meet ecotourism standards (Turismo Sostenible, 2016). But in very large and environmentally diverse countries like the U.S., it is difficult to implement national standards for ecotourism. Industry-wide standards in the tourism economic sector are of little

interest to tour guides and hotel operators. Instead, it is industry-specific standards from insurance or state and federal regulatory agencies that are implemented and followed (Bryan, 2008). This concept will be explained further in the National Park System section.

Even though few pioneers of official ecotourism exist in the U.S. currently, the opportunity to develop an American ecotourism market is present. In 2002, the U.S. ranked number one in international tourism receipts, and domestic travel within the U.S. and Canada was estimated to be several times greater than other countries (McBoyle, Schwartzentruber, & Scott, 2004). Mieczkowski's Tourism Climate Index (TCI) assess the supply and quality of climate resources for tourism. The U.S. contains 4 of the 6 TCI zones: summer peak, winter peak, bi-modal shoulder peak, and optimal. This makes the U.S. a destination for tourism throughout the year, compared with Canada who falls only in the TCI summer peak climate (McBoyle, Schwartzentruber, & Scott, 2004). Thus, opportunities for ecotourism in the U.S. are diverse; from an energy efficient mountain ecolodge thriving on summer hiking expeditions, to a sustainable Florida waterfront ecolodge capitalizing on snowbird travel to the coasts during sunny winter months. The forecasted growth of the U.S.'s tourism market combined with heightened global awareness of climate change and the associated sustainable intervention creates the optimal setting for ecotourism development to unfold.

2.2 THE ECOLOGE

ECOLOGE DESIGN

A central component of ecotourism is the 'ecolodge,' a term that refers to the site and structure where ecotourists stay and where ecotourism activities occur. In an assessment of ecolodge development in the 21st century, H. Ceballos-Lascurain states; "the most important thing about an ecolodge is that the lodge is not the most important thing" (Ceballos-Lascurain, 2005, 212). But rather it is the surrounding environment and its quality that matters most. The following ecolodge definition was developed by Hitesh Mehta, a landscape architect and ecolodge expert:

"An ecolodge is a two-to seventy-five room, low-impact, nature-based, financially sustainable accommodation facility that helps protect sensitive neighboring areas; involves and helps benefit local communities; offers tourists and interpretive and interactive participatory experience; provides a spiritual communion with nature and culture; and is planned, designed, constructed, and operated in an environmentally and socially sensitive manner" (2010, 10)

Through years of research, interviews, interaction with indigenous communities, and discussion with stakeholders in the ecotourism industry, Mehta has

developed a set of criteria used to determine the authenticity of ecolodges. After leaving his job as a landscape architect and environmental planner, Mehta travelled the world using his criteria to evaluate forty-four ecolodges in just three years to produce his latest book: *Authentic Ecolodges*. For an ecolodge to meet Mehta's criteria, the ecolodge must first satisfy the three main principles of ecotourism; conservation of local land, benefit to local communities, and provide interpretation to local people and guests that encourage sustainable travel. Then, the next step is to meet at least two of the eight additional ecolodge criteria below to be considered an authentic ecolodge:

1. Use alternative and sustainable means of water acquisition and at the same time reduce overall water consumption.
2. Meet its energy needs through passive design and renewable sources.
3. Provide for careful handling (reduce, refuse, recycle, reuse) and disposal of solid waste.
4. Use environmentally friendly sewage treatment systems.
5. Fit into its specific physical and cultural contexts through careful attention to form, landscaping, and color as well as through the use of vernacular architecture.

6. *Use environmentally friendly building and furnishings materials.*
7. *Have minimal impact on the natural surroundings and utilize traditional building techniques during construction.*
8. *Endeavor to work with the local community, including community members, wherever possible, in the initial physical planning and design stages of construction (2010, 11).*

ECOLOGDE EXAMPLES

There are many creative and successful precedents of ecolodges across different areas of the world that meet Mehta's ecolodge criteria. Most of these examples however occur in developing countries. For example, Lapa Rios Ecolodge in the Osa Peninsula, Costa Rica was developed in 1993 and has since been a model for ecolodge design. The lodge's 900 acres are primary rainforest with a small area of secondary rainforest that was once cattle pasture. The lodge itself consists of 17 individual cottages and a main restaurant structure, and is run mainly by local people. The lodge is very responsible in its use of natural resources and waste management. Air conditioning is substituted with cross ventilation design in cottages, food is sourced locally, and all waste is either recycled, composted, or fed to the lodge's pigs whose excrement is even harnessed to produce methane gas to power stoves. (Author, 2017)

A second ecotourism project, led by University of Toronto's professor Aziza Chaouni is the development of a comprehensive master plan for a newly dedicated special area of the Shobak region in Jordan. This project involved extensive data collection (interviews, mapping, and precedent studies) and a multidisciplinary approach to design for the area's recreational facilities, proposed accommodation facilities, and trail design (Chaouni, 2014). Preserving the local nomadic peoples' culture and to continue their way of life was a key part of this project (Chaouni, 2014).

Another ecolodge example is Il Ngwesi Lodge in Kenya. This lodge, owned by the local community, is result of the Laikipiak Maasai people donating 80% of their land for conservation in 1994 (Eco Tourism Kenya, 2016). Tourists who visit Il Ngwesi stay in one of the 6 modest and low-impact cottages and are led on wildlife tours by local people who now serve as wildlife educators and stewards of their land instead of wildlife hunters (Eco Tourism Kenya, 2016).

Every ecolodge is unique in form and function in order to uphold sustainability best practices and meet specific environment and climatic needs of the region. For this reason, examining other ecolodges can provide ideas for design strategies, sustainable technologies, and social partnerships and programs. Precedent studies of selectively chosen ecolodges are used later in this report as

a research method to generate knowledge for creating an ecolodge site design.

The third component of the ecotourism model, and a necessary pillar of an ecolodge's theoretical foundation, is to benefit local people and to create a reliable new way of life. This component is somewhat disconnected in the U.S. where remaining indigenous people—or Native Americans—have long ago been forced off their original land by military force (Honey, 2008). Developing tourism facilities that preserve, educate, and enhance the lives of Native Americans in the U.S. may be possible, but cannot be thought of or executed in the same way as a typical ecolodge described in the previous examples. This interesting relationship between indigenous people, conservation, and tourism in the United States, is largely due to the history and development of the world's largest National Park System. But even if an ecolodge in the U.S. cannot cater to "indigenous" people, it certainly can be inclusive and provide opportunities for the surrounding local community and its people.

EXISTING FRAMEWORKS RELATED TO ECOLOGDE DESIGN

To help guide sustainable design in the U.S., there are two accredited widely used sustainable construction and development frameworks: LEED green-building certification and the Sustainable SITES® Initiative. In Florida there is also a program called The Green Lodging Program, initiated by the Florida Department

of Environmental Protection, that recognizes accommodation facilities that have taken action to conserve and protect natural resources. These three programs along with the criteria of ecolodge design, share similarities in their commitment to sustainability.

LEED is a third-party verification of green building and is meant for all building types at all phases of development (LEED, 2016). A LEED certified building has met the accepted guidelines of the LEED Green Building Rating system, which incorporates seven main principles:

- *Lot design, Preparation and Development*
- *Resource Efficiency*
- *Water Efficiency*
- *Indoor Environmental Quality*
- *Operation Maintenance and Homeowner Education*
- *Global impact* (Kubba, 2009)

Under the seven guiding principles, there is a minimum number of points required for the building to receive certification. The sum of these points indicate the sustainability level of the green building—bronze, silver, gold, or platinum (Kubba, 2009, 22). Because the LEED green-building rating system can be applied to many different building types (residential or commercial) and at all stages of a building's life cycle, it alone is not specific enough to guide ecolodge design. However, an ecolodge which possess a LEED green-building certification "provides recognition of its quality and environmental stewardship...[and] is widely accepted by public and private owners (Kubba, 2009, 21).

The SITES® initiative is a comprehensive system for developing sustainable landscapes (SITES®, 2016). Like the other sustainable programs, SITES® offers a comprehensive rating system, but the intent of this program is to distinguish sustainable landscapes certifying development projects with or without buildings (SITES®, 2016). The priorities of SITES-certified landscapes are to “reduce water demand, filter and reduce stormwater runoff, provide wildlife habitat, reduce energy consumption, improve air quality, improve human health and increase outdoor recreation opportunities” (SITES®, 2016).

Developed by the Florida Department of Environmental Protection, the Florida Green Lodging Program is a voluntary initiative designating lodging facilities that have made a commitment to conserve and protect Florida’s natural resources. For a lodging facility to be recognized by Florida’s Green Lodging program, the facility must go through a property assessment process that includes five areas of sustainable practices: communication and education, waste reduction/reuse and recycling, water conservation, energy efficiency, and indoor air quality. This evaluation system also uses points, and a passing lodge can receive a 1, 2, 3, or 4 palm rating with 4 being the best (Florida DEP, 2016). In order to maintain the Green Lodging title, hotels and lodges are required to send in annual reports documenting their energy conservation, water conservation, and waste reduction.

Overall, frameworks from LEED from SITES® and from Florida’s Green Lodging Program have many areas of crossover with the ecolodge criteria developed by Mehta above. Because ecolodges are meant to meld seamlessly and harmoniously with their surrounding landscapes, the SITES® initiative specifically is relevant in the design of nature based tourism master plans. All three programs together can undoubtedly produce sustainable buildings and landscapes—both of which an ecolodge should be. But there are three ecolodge criteria that fall outside the scope of LEED, SITES®, and the Green Lodging Program: 1) “Fit into specific physical and cultural contexts through careful attention to form, landscaping, and color as well as through the use of vernacular architecture; 2) utilize traditional building techniques during construction; and, 3) Endeavor to work with the local community, including community members, wherever possible, in the initial physical planning and design stages of construction (Mehta, 2010, 11). For this reason, ecolodge design needs its own certification system. If the ecotourism industry can progress from ecolodge guidelines (which are largely unknown and used only by developers, non-governmental organizations, and consultants) to an international ecolodge certification, truly authentic ecolodges will become the standard, and issues with greenwashing will begin to diminish (Mehta, 2007).

2.3 SUSTAINABLE SITE DESIGN

SUSTAINABILITY IN LANDSCAPE ARCHITECTURE

Of all design, construction, and development professionals, landscape architects have the greatest opportunity to incorporate sustainable principles to protect and revive natural systems. The nature of landscape architecture is to design the function, atmosphere, and appearance of outdoor space. Though, there is a wide variety in project scales, project setting (urban v. rural), and project type, most landscape architecture projects involve combining the built environment with the natural environment. The profession of landscape architecture has always been concerned with the natural environment, but now more than ever, sustainable design has risen in importance. The word ‘ecotourism’, like the word ‘sustainability’, can sometimes lose its meaning when it is not tied to actual solutions or methods that address the environment. Critics of sustainability may ask: What is the value of a sustainable site? What aspects of a site must be considered and addressed to design a sustainable site? What are the challenges in designing a sustainable site? How can the sustainability of a site be measured or evaluated?

THE SUSTAINABLE SITES INITIATIVE: A GUIDE FOR LANDSCAPE ARCHITECTS

The most relevant strategy, tool, and guide for addressing sustainability in the profession of landscape architecture is called the Sustainable Sites Initiative (SITES®). This initiative was developed in a partnership between the American Society of Landscape Architects, the Lady Bird Johnson Wildflower Center at the University of Texas at Austin, and the United States Botanic Garden (Calkins, 2012). This guide was developed specifically for landscape architects and outlines the steps or considerations for a sustainable site along with a rating system to evaluate a site’s level of sustainability. The framework breaks down site intervention and ecosystem consideration into 7 categories: assessment and site selection, water systems, vegetation systems, soil systems, materials and resources, cultural and human health systems, and maintenance and monitoring. Within each category there is a description of four levels of sustainability from preservation (least amount of intervention) to regeneration (the most sustainable). The central message of the SITES® program is “that any project—whether the site of a university campus, large subdivision, shopping mall, park, commercial center, or even a home—holds the potential to protect, improve,

and regenerate the benefits and services provided by healthy ecosystems” (SITES v2 Rating System, 2014). The SITES® guide and rating system will be further explained, and then used later in the design stage (Chapter 5) of this master’s project.

SUSTAINABILITY AND ECOSYSTEM SERVICES DEFINED BY SITES®

The SITES® initiative defines sustainable design as “design, construction, operations, and maintenance practices that meet the needs of the present without compromising the ability of future generations to meet their own needs” (Calkins, 2012, 2). The SITES® initiative acknowledges that true sustainability includes not only environmental conservation, but also economic realism social equity (Calkins, 2012). This “triple bottom line” is the key to sustainable design and is reflected in the organization of SITES® guidelines and rating system (see FIGURE 2.3).

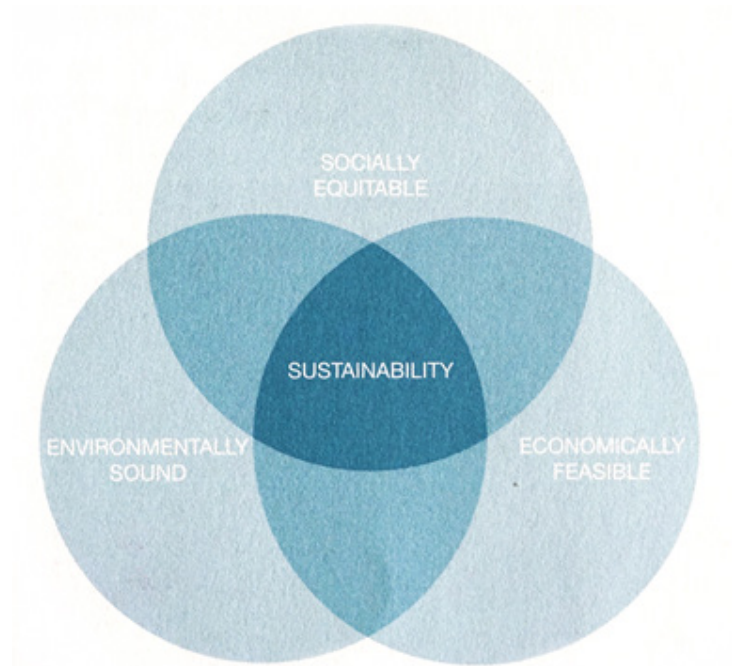


FIGURE 2.3: Sustainability “Triple Bottom Line” (Calkins, 2012, 3)

Ecosystem services, defined as “the benefits humans obtain from ecosystems” by SITES® are the basis for the SITES® framework and rating system.

Ecosystem services include:

- Global climate regulation
- Local climate regulation
- Air and water cleansing
- Water supply and regulation
- Erosion and sediment control
- Hazard mitigation
- Pollination
- Habitat Functions
- Waste decomposition and treatment
- Human health and well-being benefits
- Food and renewable nonfood products
- Cultural benefits (Calkins, 2012, 5)

Healthy ecosystems provide services that have economic value—but this value is often overlooked or taken for granted by most people. In 2005 for example, the Millennium Ecosystem Assessment estimated that the value that wetlands provide to the world is \$15 trillion dollars annually including the water supply from which 1.5-3 billion people depend. But sadly, wetland ecosystems are being destroyed faster than any other type of ecosystem due to human activity (Calkins, 2012). However, the economic benefit of sustainable design and development “are being increasingly quantified,” meaning they are becoming more accepted and widely used (Calkins, 2012).

The firm basis for sustainable site design project goals in every project are on providing new ecosystem services, or protecting the existing ones (Calkins, 2012). The meaning of sustainability for the SITES® initiative is unique for its inclusion of regenerative systems; “a system that will balance or achieve positive resource flows and create closed-loop systems where waste from one process is food for another” (Calkins, 2012, 17). This idea of regenerative design, or 100% sustainable design is SITES® ultimate goal; however progress (at any level) toward regeneration and moving away from wastefulness is a step in the right direction. There are 10 guiding principles used to design sustainable sites attempting regeneration as defined by the 2014 SITES® v2 Rating System:

1. Do no harm
2. Apply the precautionary principle
3. Design with nature and culture
4. Use a decision-making hierarchy of preservation, conservation, and regeneration
5. Provide regenerative systems as intergenerational equity
6. Support a living process
7. Use a systems thinking approach
8. Use a collaborative and ethical approach
9. Maintain integrity in leadership and research
10. Foster environmental stewardship

The sustainable SITES® initiative is the most current and effective model for increasing sustainability in the discipline of landscape architecture today.

Sustainability has shifted from conserving alone, to also include ways to regenerate the land through performative landscapes—and the SITES® initiative helps landscape architecture get there (Petersen, 2016).

The sustainable SITES® initiative has a standard list of prerequisites and additional credits for each section of site design and construction. To be certified as a SITES® project, all the prerequisites must be met for each section, and a certain number of additional sustainability credit points combined between the sections must be reached. The many different options of credit points allow for multiple sustainable approaches to different project scales and locations.

Clearly a project which achieves SITES® certification has found solutions in multiple areas of sustainability. Many principles and focus areas of SITES® have overlap with Mehta's authentic ecolodge criteria. For ecolodges developed in the United States, SITES® guidelines should be considered early on in the design process and certification sought if possible.

2.4 TOURISM IN U.S. NATIONAL PARKS

HISTORY OF ACCOMMODATIONS IN AMERICAN NATIONAL PARKS

The history of the National Park Service is long and detailed, beginning in 1914 when Yellowstone National Park became the world's first official national park (Dilsaver, 1994). Landscape architecture holds an important role in the history of national parks, and is directly linked to the public's appreciation and use of the parks (Carr, 1958). The following historical overview summarizes significant events and changes to the National Park System, related to development of infrastructure and role of recreation and tourism within the parks.

In the early 1900s newly dedicated large areas of American wilderness as the first National Parks sparked the need for a management of these parks, or for a 'National Park Service.' Landscape Architect Frederick Law Olmsted laid much of the groundwork for a national park policy through his management recommendations for Yosemite Valley (Dilsaver, 1994). In 1916 an act to establish a National Park Service was introduced. The act called for the regulation of federal areas (or national parks) whose fundamental purpose "is to conserve the scenery and the natural

and historic objects and the wild life 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" (Dilsaver, 1994, 115). In the mid 1920s Park Service landscape architects, like Thomas Vint, and Daniel Hull, were leading projects in collaboration with architects and engineers to develop an original style of architecture and development known as 'park rustic.' Much of the planning and design work done at this time was compiled into some of the nation's first master plans (Carr, 1958). The popularity of national parks and the number of park visitors quickly grew across the nation. In 1929 the 1914 act was amended to add a concessions policy. Meaning that, with permission from the park system, private parties, firms, and corporations would be able to provide facilities for accommodation and recreation to the public within national parks and monuments (Dilsaver, 1994). But the original purpose of the system, to "conserve... for the enjoyment of future generations," was quickly forgotten in some early accommodation and recreation examples. The end of WWI and the start of WWII, the National Park Service modernized and developed extensively (Carr, 1958). During the Great Depression, and under Franklin Roosevelt's administration, the National Park System saw the greatest expansion to

date (Dilsaver, 1994). During this time, the Civilian Conservation Corps (CCC), was established in 1933 to create jobs for unemployed young men. This organization built hundreds of miles of roads and trails and constructed thousands of structures from accommodations to museums to employee housing over the next nine years (Dilsaver, 1994). To this day, many states owe the origins of their state park systems, and the majority of facilities within them, to the labor of CCC enrollees and the landscape design and planning of Park Service professionals (Carr, 1958). This alarmingly fast development spawned suspicion and then opposition from conservationists and resulted in the Emergency Conservation Committee calling for reevaluation of road construction through National Parks (Dilsaver, 1994).

Slightly after the period of the CCC came one of the Park System's most significant acts, introduced by landscape architects called the "Atmosphere Preservation Act" in 1936. This idea was the first attempt to harmonize the relationship between the four parties interested in National Parks: 1) tourists who visit the park, 2) the future American generations, 3) the Government, and 4) public operators whose livelihood depends on operations inside the park (Dilsaver, 1994). This act addressed different recreation and operation areas within the park describing what is and is not appropriate to create a healthy park "atmosphere" (Dilsaver, 1994). The following decades saw park attendance

grow at an exponential rate. In 1956 a new era of development arrived for the National Park System. The Mission 66 Act was adopted which called for drastic improvement and expansion of accommodations (Dilsaver, 1994). Like the park rustic movement of the 1920s, the Mission 66 movement encouraged growth and was accompanied with a new modernized architectural style popular across the country. Instead of roads and bridges, the development priority of this program was on modernizing accommodations so that the park visitor can be assured of a comfortable place to stay (Dilsaver, 1994, 1940). In the decades following Mission 66 Act, the system entered into an "Ecological Revolution" (Dilsaver, 2014). For example, in 1968 the Administrative Policies for Recreation Areas Act mandated related factors in recreation and accommodation, ranging from solid-waste disposal to exotic plant species control (Dilsaver, 2014). Today the U.S. has the largest number of legally protected areas in the world—over 84 million acres—spread across every state except Delaware (Honey, 2008).

As the population and popularity of nature-based tourism grows, park visitor numbers are expected to rise. Concern for responsible resource management and development strategies for accommodations and recreation areas within National Parks must continue to grow as well.

TOURISM PRESSURES IN NATIONAL PARKS

The idea of creating a national park system comes from tourism—the need for recreation and human access into the country’s most scenic natural areas. Before coordination of parks at the national scale was in place, advocates, like Calvin Coolidge at the 1924 National Conference on Outdoor Recreation, called “to expand and conserve throughout the country our recreational opportunities” (Carr, 1958, 259). But recreation and conservation is not always easily balanced, especially in treasured, natural places. The country’s early national parks featured fully programmed recreation areas including swimming pools and ball fields. But by many critics in the late 1930s, these types of amenities were believed to be eroding the parks’ physical sites and spiritual identity (Carr, 1958).

In the book *Wilderness by Design*, Carr predicts; “as existing facilities become more and more crowded, the parks will cease to be a public in any meaningful sense, since only those who make reservations far in advance will have access” (Carr, 1958, 310). In the case of some national parks, he is accurate in his prediction. Zion National Park for example has moved to a reservation and in-advance permit purchase system. Home to Utah’s giant and colorful sandstone cliffs, visitors at Zion National Park are encouraged to purchase their permits ahead of time, by up to three months, to ensure access into the park. On the other hand, not all national parks are turning to

wait lists to ensure conservation and environmental quality. The Mariposa Grove in Yosemite National Park is currently in a stage of restoration to shift the way tourists experience the park. The Grove’s iconic and massive sequoia trees have attracted tourists to the area for decades. But in order to protect these giants, restoration efforts are eliminating vehicular access, converting roads to trails and boardwalks, consolidating parking areas to one base parking lot, and eliminating commercial activities in the park altogether (National Park Service, 2016). Visitor access is not limited but has been redesigned; the trail network has expanded and a tram has been added for people without the ability to hike. The restoration process will be completed and ready for visitors by the summer of 2017. Certainly, visitor numbers are different for each national park, and response to increased visitation (if applicable) will depend on the region and amenities.

But not all national parks are needing to restrict access. The Everglades Park for example is an environmental treasure for Florida and its residents. But because of an extreme climate, the park is largely visited only half the year, in the region’s cooler winter months. Another factor that reduces visitor pressures at the Everglades are surrounding tourism destination alternatives: the Florida Keys, the white sandy beaches of the Gulf Coast, and urban attractions of Miami. For these reasons, park visitation is not limited in the Everglades but rather, encouraged for travelers to gain an understanding and appreciation for the park’s remarkable wetland ecosystem.

ECOLOGDE DEVELOPMENT WITHIN THE UNITED STATES' NATIONAL PARKS

The U.S. has no federal laws outlining ecotourism protocols, but instead responsibility falls to individual states to create their own mandates, which would vary widely (Weaver, 2001). As stated earlier, accommodation development and management within the U.S.'s national park system largely falls to concessioners. It has been argued that ecotourism is not needed within national or state protected areas, but instead should occur outside of protected areas for the sake of promoting conservation (Weaver, 2001). However, developing an ecolodge on private land bordering or around the region of national parks is met with challenges as well. "Amenity migration," is defined as the influx of upper-class city workers to scenic rural areas (often along the borders of national or state parks) looking to purchase land and build holiday homes (Buckley, 2003). This trend creates a challenge as it raises land value increasing competition, creates denser boundaries for wildlife movement compared to farms or forests, and can be the source of new invasive species introduction (Buckley, 2003). Likewise, growing commercial tourism interests may dominate partnerships with protected-area management agencies sometimes leading to the misuse of land and its resources (Buckley, 2003). The benefits of nature based tourism planning must be made known to the National Park Service before they can be adopted and implemented in future park development or restoration.

2.5 PROJECT STUDY SITE

The site chosen for this study is the Flamingo District, which is the southernmost point of the Everglades National Park in Florida. The Flamingo District was chosen as the study site for two reasons: 1) because of its remote and natural setting, ideal for ecotourism operations; and 2) its obvious need for redevelopment, and desire for tourism growth.

EVERGLADES NATIONAL PARK

The Everglades National Park is known as the largest subtropical wilderness in the United States. Over 1.5 million acres of unique landscape make up the Everglades National Park, which is rich in wildlife habitat and offer a diverse range of tourism opportunities. The Everglades National Park is the largest National Park East of the Rocky Mountains and is also a World Heritage Site, and International Biosphere Region (U.S. National Park Service, 2016). The Everglades was established as a National Park in 1947 after the support of early conservationists and advocates. Long before this, the first people of the Everglades were believed to be the Calusa, a fierce fishermen tribe whose territory spread across southern and western Florida (Florida Museum, 2017). The Calusa people eventually died off from exposure to diseases from the Spanish by the mid 18th century.

The Seminole and Miccosukee Native American tribes were the next residents in the Everglades, but this was not their original homeland. These two tribes originally lived in the northern part of Florida and across the present day southeastern United States, but after the Indian Removal Act of 1830, were forced southward in retreat from the American's during the first, second and third Seminole Wars (Historical Society of Palm Beach County, 2009).

During the decades before its designation as a park, American settlers attempted to convert large areas from wetlands to developable land through drainage. Across south Florida, entrepreneurs like Henry Plant and Henry Flagler began to build railroad networks through the Everglades and clear mangrove shorelines to build roads and canals for tourist development (U.S. National Park Service, 2016). Early communities existed in the Everglades at Chokoloskee, Everglades City, Cape Sable, and Flamingo. These small communities were mainly farmers or laborers and the main industries were sugar cane farming, and charcoal production. Life in these communities was often difficult, unpleasant, and unsafe. Mosquitos and fleas were everyday problems, and hurricanes were unpredictable flooding entire farmsteads or flattening communities at times. All

this early development in an attempt to create more useable land shrunk the Everglades watershed from its original headwaters stretching nearly to Orlando, down to Lake Okeechobee (Lodge, 2005). Today the original ecosystem has begun to heal, thanks to the Everglades' designation as National Park and the work of conservationists and environmental activists. Marjory Stoneman Douglas is the single most well-known advocate of the Everglades. Her work began in the early 1920s as she joined the movement in Miami to create an Everglades National Park. Her interest and passion for the Everglades did not falter as she wrote the book *The Everglades: River of Grass* in 1947, and created The Friends of the Everglades organization for environmental protection and education in 1970. Thanks to advocates like Douglass, the park today is almost completely wild—a wonderland, particularly for kayak exploration, bird watching, fishing, and backcountry camping.

Although the physical area of the Everglades is vast, the park is largely unusable for humans, and is even more limited in terms of developable land due to its characteristic wetland conditions. The large park has limited points of access, few campsites with services, and almost no hiking trails because of the park's wetland ecology. But the range of biodiversity, the unique flora, the extensive system of backcountry waterways, and camping, make the park an attraction for many different types of visitors. Flamingo (see FIGURE 2.5) is the only location in the park that offers

campgrounds, facilities, an education center, groceries, fuel, a marina, hiking, canoe trails and boat tours all in one location (U.S. National Park Service, 2016).



FIGURE 2.5: Everglades Park Boundary and Flamingo Location

THE FLAMINGO DISTRICT

Located over an hour from the Everglades' closest park entrance, Flamingo is a remote destination—see location map in Figure 2.5.1. Flamingo was originally an agricultural settlement with 49 residents in 1910, and reachable only by boat. In 1921 the Ingraham Highway was built connecting the community to the larger region of South Florida. By 1951 all of the residents were gone due to relocation by the National Park Service and multiple hurricane events. Construction began in Flamingo in 1956 to create a visitor center and lodge as part of the National Park Service's Mission 66 Act (U.S. National Park Service, 2016). By 1968 development of the district was complete. Much of the original development is still in existence today. Many services needed by Everglades tourists are available in Flamingo, creating a remote oasis of amenities. However, a full-service restaurant and overnight lodging has been lacking at Flamingo for more than 11 years now.

In 2005 hurricane Katrina greatly damaged much of the Flamingo District, and completely destroyed the previous restaurant and lodge. There has since been a significant amount of national attention focused on the Flamingo District. In the summer of 2016 Flamingo competed for and won the Partners in Preservation grant that is being used to make minor improvements to the existing visitor center. The NPS's hope is that this is the beginning of many improvements to the district (U.S. National Park Service, 2016). A concession prospectus or Request for Expressions of Interest

(RFEI) has been issued for Flamingo. From it, the park is seeking business proposals to provide services for tourists and renewal of the area's "small cottage and eco-tent lodging, boat tours, canoe/kayak rentals, retail sales, skiff and houseboat rentals, a full service restaurant, marina services and slip rentals as well as a walk-in campground" (U.S. National Park Service, 2016).

The concession prospectus provides a detailed list of desired amenities and improvements. This proposal opens the door for re imagining nature based tourism, ecolodge design, and sustainable site development within the Everglades National Park.



FIGURE 3.0: Flamingo Marina (Steward, 2017)



03

METHODOLOGY

METHODOLOGY

The research methodology proposed for this study is projective design. As can be seen in this project's research question, design is a key component:

How can authentic ecolodge criteria and sustainable site design principles be adapted and applied to inform the design of an ecolodge at the Flamingo District in Everglades National Park?

To generate a new ecolodge, this project uses projective design. Projective design is design meant to investigate a specific research question and must produce findings that “contribute to the development of the discipline” of landscape architecture (Deming & Swaffield, 2011, 51). The specific research methods used for data collection in this research project are:

- Precedent Studies
- Interviews
- On-Site Observation
- Site Analysis

Findings will ultimately inform the final ecolodge design for the Flamingo District in the Everglades National Park. FIGURE 3.1 shows a diagram of the methodology, research methods, and design strategy utilized for this study.

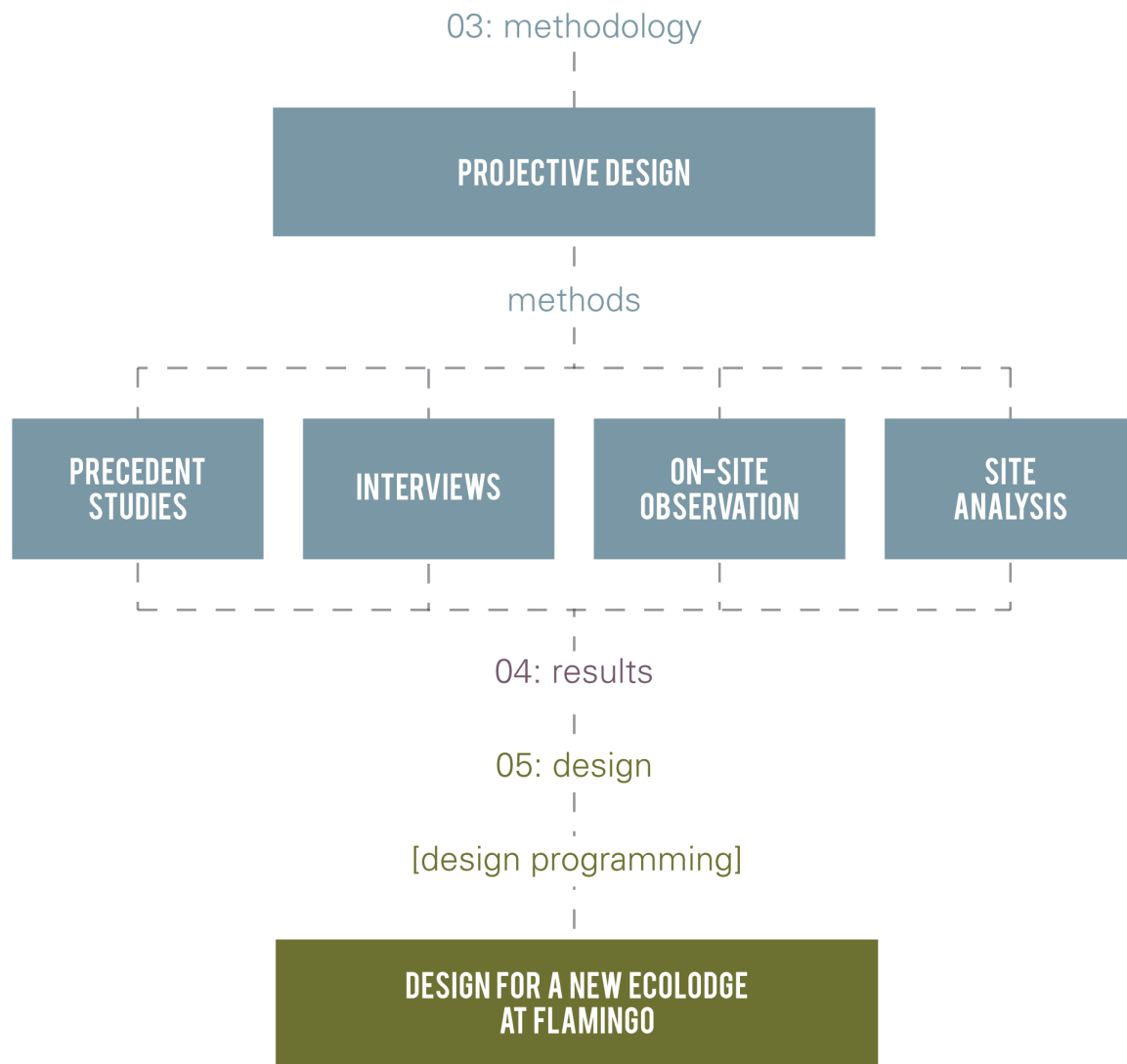


FIGURE 3.1: Methodology Diagram

METHODS

1. PRECEDENT STUDIES

The Flamingo site has many challenges for tourism including: tropical storm vulnerability, coastal location, remoteness, mosquitos, and overgrown vegetation. Proposing an ecolodge at Flamingo creates design challenges such as needs for renewable energy sources, use of sustainable materials, and development of a compact site layout. Solutions for similar challenges can be found through precedent studies of other ecolodge projects. The goal of this research method is to extract successful ecotourism strategies, site design solutions, and energy/water conserving technologies that could be applied to the sustainable site design for an ecolodge at Flamingo. To be selected as a relevant precedent for this study, an ecolodge must satisfy 3 of the following criteria:

- Coastal positioned with direct ocean access
- Within a tropical or sub-tropical climate
- Accommodate a similar number as Flamingo's proposed range of 24-40 rooms
- Located in or adjacent to a national park or national land reserve
- Remote and wild atmosphere; 20 miles or more from the nearest town

This precedent research collects both programmatic

and aesthetic examples needed to design an ecolodge at Flamingo. To maintain consistency for comparison, each precedent will be studied in terms of:

- Location
- Owner
- Designer
- Project Scale
- Region's Significance
- Ecolodge Experience
- Renewable Energy Strategies
- Materials Used
- Dedication to the Environment
- Strategies for Flamingo

2. INTERVIEWS

Open-ended, conversational interviews with National Park professionals will be conducted. These interviews are meant to generate knowledge about the existing facilities, management, history, and future of the Flamingo district. People to be interviewed are the Everglades Park Planner, and the Everglades District Interpreter. The purpose of interviewing the Everglades Park planner is to understand the management and the current plan by the National Park Service for "rebuilding" Flamingo.

The purpose of interviewing the district interpreter is to get a feel for what day to day life is like at Flamingo, learn more about the people who visit, and the challenges that the park is facing.

All interviews will be recorded, and interviewees' names and positions will be documented. All interviewees will receive a cover letter and a copy of the questions to be asked before the interview. Interviewees will also sign a consent form before the interview. The purpose of these interviews will provide information about the details, issues, or history related to Flamingo that cannot be learned through site analysis alone, literature review, or precedent studies. The interview is to be conversational and informal to pull out additional helpful information that cannot be foreseen.

3. ON-SITE OBSERVATION

The purpose of a site visit is to gain a sense of place and to observe physical and aesthetic qualities first hand. This qualitative data collection method informs specific design decisions. During the site visit many photos should be taken at all different areas within the district. These photos will be used in the final

report and should capture the existing architecture and facilities, the natural environment, water edges, existing trails, waterways, campsites, wildlife, native vegetation, etc. If time allows, time will be spent camping, hiking, and participating in led kayak or boat tours. These experiences will give a personal context and connection to Flamingo that will be helpful once the projective design stage is reached.

As this method is experiential, the knowledge gained is not inventoried as a separate method in the results section of this book. Instead, the observations made and photos taken while on site will be used to further support the site analysis.

4. SITE ANALYSIS

To understand Flamingo's opportunities and constraints for ecolodge development, a series of site analysis studies must be conducted at regional, district, and site scales. Data will come from GIS, Google Earth, and the Everglades National Park map files. Maps for the regional, district, and site analysis each have a consistent frame/context and share a cohesive visual quality. The layers of data are mapped individually for superior readability and clarity. Mapping at these three scales provide context for this project, and is a

necessary step before an ecolodge at Flamingo can be envisioned. These maps reveal opportunities and constraints for the design process of this project. The purpose of this method is to directly inform decision making of the site.

To understand how the Flamingo site is impacted by regional systems the Everglades Park boundary will be used as the extent for the regional maps. Regional analysis will include:

- a. Physical Context
 - To show the region's land form, water edges, roads, and park boundary, and cities.
- b. Hydrology
 - To show the region's rivers, canals, ponds and surrounding ocean depth.
- c. Ecology
 - To show the Park's 9 ecosystems (Everglades National Park Service).
- d. Recreation
 - To show the Park's trails, waterways, and marinas will be mapped.
- e. Access
 - To show how Flamingo is accessed by travelers and shows where international airports are in relation to the Park.

To understand the amenities and physical surroundings adjacent to the Flamingo site, district scale mapping is used. The Flamingo district contains: a marina, visitor center, staff living, campgrounds, previous lodge site,

and more. District Analysis will include:

- a. Context
 - To show water edges, natural areas, roads, trails, and building outlines. The use of each area in the district is identified.
- b. Program
 - To show how and when the site is used by visitors. This map will also show what services are available in each area.
- c. Vegetation
 - To show the different vegetation types present at the Flamingo District: native vegetation (mangroves and coastal prairie primarily) mowed turf, and disturbed vegetation.
- d. Wildlife
 - To document different wildlife species regularly seen in the Flamingo District

■ To understand existing conditions, analysis at the site scale is done. Site inventory makes clear what the site's current amenities and physical qualities are. Site analysis is important to reveal opportunities and constraints for developing an ecolodge design program. Site analysis will include:

- a. Site Identity
 - To show the physical size of the site, and where it is located within the district.
- b. Site Inventory
 - To document the site's existing conditions using on-site photography

- c. Diagramming
To show all existing vegetation, circulation, utilities, development from Flamingo's previous lodge, and primary views.
- d. Opportunities and Constraints
Through the synthesis of site identity, site inventory, and site diagramming, these are expressed through writing.

POST DATA COLLECTION

The data collected through the four research methods will be used to inform the development of design program, and final site design of an ecolodge for the Flamingo district. Additional information used for design will come from: Flamingo's RFEI document, the Sustainable SITES® Initiative, and Mehta's Authentic Ecolodge Criteria.



FIGURE 4.0: Buttonwood Canal (Steward, 2017)



04

RESULTS

PRECEDENT STUDIES

Four ecolodges from across the world were analyzed as precedents. The goal of this research method is to extract successful ecotourism strategies, site design solutions, and energy/water conserving technologies that could be applied to the design for an ecolodge at Flamingo.

PRECEDENT FINDINGS SUMMARY

Trends common between these lodges were use of: solar water heating systems; composting toilets; elevated building structures on raised wooden platforms; and, dramatic views to the ocean. Tenta Nakara and Concorida Eco-tents used energy restriction as a sustainability method; eliminating electricity from rooms completely at Tenta Nakara and making potable water available only at main locations for Concordia Eco-Tents. Bay of Fires Lodge and Concordia Eco-Tents used guest labor to reinforce the idea of conserving resources by hand pumping their showers. On-site vegetable gardens were used at Tenta Nakara and Isla Palenque. Separate eco-tents or bungalows individual rooms were the trend, although Bay of Fires Lodge operated out of two main pavilion buildings. These four precedents, from 3 different continents, ranged in their level of luxury

for guests and their accessibility—logistically and financially. However, all four lodges used sustainable design strategies and environmentally friendly technologies. Elements from each lodge will be used to inform the sustainable site design for an ecolodge at Flamingo.

The 4 ecolodges selected were: Bay of Fires Lodge in Tasmania; Concordia Eco-Tents in St. John Virgin Island; Tenta Nakara in Thailand; and, Isla Palenque Lodge in the Republic of Panama. The following pages show findings from each individual precedent facility.

PRECEDENT 01: BAY OF FIRES LODGE

<i>location</i>	Bay of Fires Beach, Tasmania
<i>owner</i>	Anthology Pty. Ltd.
<i>designer</i>	Ken Latona (architect)
<i>project scale</i>	84 acres, two lodge buildings, accommodation for 20 guests
<i>region's significance</i>	This region in north east Tasmania is home to many aboriginal sites. This indigenous culture has lived a nomadic lifestyle in the area for over 5,000 years. Today, the remote Bay of Fires coastline is part of Mount William National park. The Architect received approval from the Aboriginal Land Council and permissions from the park before building the lodge. The region is also known for its iconic mammals—Tasmanian devils, wombats, wallabies, and kangaroos.
<i>ecolodge experience</i>	To replicate the nomadic lifestyle of the aboriginal people, the lodge can only be reached by foot—a 15 mile trek is required for guests to access the lodge. The lodge is a “wholly sustainable shelter” meant to protect the landscape and make guests feel connected to the “dramatic coastal environment” (Hochman, 2017). The lodge is completely remote with no phones or wifi, and no TV. The entire design of lodge, situated 130 ft up from sea level, is focused around sweeping views of the horizon and the sea.



FIGURE 4.1: Bay of Fires Lodge (Tasmania Walking Company, 2017)

PRECEDENT 01: BAY OF FIRES LODGE

renewable energy strategies

Solar heated showers, where guests must pump their own water (40 pumps to be exact) for a 5 minute hot shower. All restrooms feature composting toilets. Solar power-generated appliances are used. A wood burning fireplace heats the lodge, and most cooking is done over an outdoor fire pit. The lodge also captures its rainwater for reuse (Mehta, 2010).

materials

Tasmanian hardwood and hand-hammered steel for lodge structure and local plantation pinewood for decks and stairs (Mehta, 2010). Metal pitched roof, and large un-shaded picture windows.

dedication to the environment

Guests are made aware of their impact—especially when they must work for a shower! During construction, all materials were flown in by helicopter, or carried in by foot to preserve the surrounding ecosystem. Only 4 trees were removed in the building process.

strategies for flamingo

Condense rooms together in larger pavilions or lodge buildings. Do not be afraid to implement water and sewage systems that are less “convenient” or instantaneous for guests as this can become a teaching tool for environmental stewardship. Allow the sun to power necessary technology and heat water. Let views of nature be the central design concept.



FIGURE 4.2: Lodge Materiality (Tasmania Walking Company, 2017)

PRECEDENT 02: CONCORDIA ECO-TENTS

<i>location</i>	St. John, U.S. Virgin Islands
<i>owner</i>	Stanley Selengut
<i>designer</i>	Glen Speer (architect), and Paul Ferreras (engineer)
<i>project scale</i>	50 acres, 25 tents, accommodation for 150 guests
<i>region's significance</i>	This development is located on the southeast side of St. John island and is in within the Estate Concorida Preserve (Mehta, 2010). The ecotent compound is just adjacent to Virgin Islands National Park which makes up more than 2/3 of the island. This national park is known for its rainforests, beautiful beaches, and rich mangrove and coral reef ecosystems.
<i>ecolodge experience</i>	This ecolodge is comprised of separate ecotent units all elevated 10-15ft off the ground. Separate tents create a private guest experience, but the lodge complex also includes a reception desk, swimming pool and bar, tennis court, yoga pavilion, and restaurant for socializing. The lodge embodies the principles of ecotourism and has strong ties and programs with the local community, and encourages guests to visit the local art center, restaurants and excursions (Mehta, 2010).



FIGURE 4.3: Concordia Eco-Tents (Concordia Eco-Resort, 2017)

PRECEDENT 02: CONCORDIA ECO-TENTS

renewable energy strategies

Clivus Multrum composting toilet and hand pumped hydraulic shower tanks are used in tent restrooms. The kitchen is equipped with a propane stove and cooler. Photovoltaic solar panels provide energy for tents' lights and appliances, heat the shower water, and smaller solar lights are used to illuminate walkways at night. The water is not potable, so drinking water must be obtained from the lodge's central locations.

materials

Ecotents are simply made of wood frames, canvas wrapping and unzippable window sections covered by mosquito netting. Wooden walkways and stairs connect the eco-tents.

dedication to the environment

By elevating all of the structures 10-15 feet off the ground and elevating all connecting walkways, Concordia Eco-tent Lodge has drastically minimized its building footprint. This has preserved much of the island's topsoil and preserved trees by building walkways and tents amongst the canopy. Even with an elevated design strategy, the lodge has managed to provide 5 fully accessible eco-tents to be inclusive of all guests. All food and goods available at the lodge are purchased locally with the local community in mind.

strategies for flamingo

Elevate structures, connect structures with raised walkways, and keep materiality and amenities to the necessity. By elevating structures at Flamingo, the underlying topsoil and native vegetation will be preserved. In addition, this strategy will allow for flooding, and create superior views to Florida Bay at Flamingo. Providing drinking water at the lodge's central location will eliminate the need for potable water in each tent unit. Limit car access to only a few areas—not drive-up access to every unit. Use the natural backdrop and tree canopy to design the landscape.



FIGURE 4.4: Eco-Tent Detail (Concorida Eco-Resort, 2017)

PRECEDENT 03: TENTA NAKARA

<i>location</i>	Naka Yai island, Thailand
<i>owner</i>	Chulpol “Paul” Burusratanaphan
<i>designer</i>	Owner
<i>project scale</i>	4 acres, 16 tents, accommodation for 36 guests
<i>region’s significance</i>	The lodge, only accessible by boat, is the only tourist accommodation and only fully sustainable facility on Naka Yai Island. Naka Yai is a tiny remote island just off the coast from Phuket. Thailand is known for its tropical climate, rich biodiversity, and lush vegetation.
<i>ecolodge experience</i>	The lodge’s mantra is “Nature in the Natural Way” (Connell, 2013). Limiting luxury to appreciate nature is the key idea behind this simplistic tent lodge. Tent-like bungalow structures use no electricity and are private units. Most activity occurs at the open-air beachside lounge and restaurant area.



FIGURE 4.5: Tenta Nakara (Ashes, 2017)

PRECEDENT 03: TENTA NAKARA

renewable energy strategies

Electricity is limited to the main lodge area only, and is powered by a diesel generator between the hours of 6:00pm and 10:00pm (Connell, 2013). The lodge's water source is from a previously built well providing water for drinking and cooking, for toilets (non flushing) and for (cold water only) showers (Connell, 2013). The waste from toilets is piped to one large tank, treated with EM (Effective Microorganism) technology, and then used as fertilizer (Connell, 2013).

materials

Teak furniture and decking for bungalows and lounge area. Mosquito nets and Waterproof tent cover to create "walls" for bungalows. The lounge and some bungalows feature traditional thatch roofing, while other bungalows use metal roofs.

dedication to the environment

Turning away from the typical Thailand resort model, Tenta Nakara is the only luxury eco-tent resort in all of Phuket (Connell, 2013). Lodge staff has daily beach clean-up walks and all recycling is taken weekly to a center on Phuket. The lodge also has its own vegetable garden for meals and has plans to implement a hydroponic gardening system in the future. The lodge serves a model for environmental best practices for the local community on the island and offers educational programs for the community's youth.

strategies for flamingo

Removing electricity from rooms completely at Flamingo may not be an option, but restricting electricity to only certain times of day could greatly reduce energy use. A raised teak deck floor and metal roof framework enclosing an inner tent-like room could function at Flamingo. This bungalow model would shade against southern Florida's harsh sun, protect from mosquitos, and allow ocean breezes for cross ventilation.



FIGURE 4.6: Bungalow Tent Detail (Leitao, 2012)

PRECEDENT 04: ISLA PALENQUE

<i>location</i>	Golfo de Chiriqui, Republic of Panama
<i>owner</i>	Amble Resorts
<i>designer</i>	Design Workshop (Landscape Architecture + Planning)
<i>project scale</i>	22 acres of the island is designated as developable land (including roads and trails). The current lodge has 6 rooms and 4 tents, with a max capacity of 29 people. The lodge plans to expand to 80 units.
<i>region's significance</i>	Isla Palenque is a small island off the southwest coast of Panama in Central America. Panama is known for its lush tropical rainforests and the island is home to over 37 native tree species (Design Workshop, 2010). This private island only accessible by boat is situated just along the board of Panama's National Marine Park.
<i>ecolodge experience</i>	This ecotourism experience does not stop at the lodge, but is inclusive of the whole 434 acres of Palenque Island. A complete sustainability ecotourism masterplan for the island was completed in 2010 and the beginnings of the island's lodge has opened in 2013. The masterplan centers around the idea of extremely limiting development on the island—22 acres to be exact—to preserve the original “wild and pristine paradise” (Amble, 2017). Other features of the master plan include allocating land for public park land, open space, and agritourism operations (Design Workshop, 2010).



FIGURE 4.7: Isla Palenque Aerial (Design Workshop, 2016)

PRECEDENT 04: ISLA PALENQUE

renewable energy strategies

Grey water is held in a retention pond and used for irrigation. All food waste is composted and used on the island's farms. Food is grown on the island in multi-story gardens; overstory fruit and nut trees, mid-story fruit trees or plants, fruit and herb vines and hanging plants to grow between, and understory berries, vegetables and other plants. Solar panels heat water for showers and produce energy to power 10% of the lodge currently. In the future wind turbines and additional solar panels will be added. Composting toilets and septic tanks reduce the need for centralized water (Design Workshop, 2010). Each building will have a cistern to store rainwater captured from Panama's frequent showers. The width of roads connecting the areas of the island are reduced to 50% as only electric cars are permitted. All utilities are located under roads.

materials

Rooms feature hardwood floors, steel frames, large windows, pitched metal roofs, and hardwood exterior siding—all elevated up off the ground. Rooms have outdoor solar heated showers enclosed by bamboo privacy screens. Tent accommodations are basic tents laid over hardwood deck platforms with direct beach access and outdoor showers.

dedication to the environment

The entire planning and operation of the island is a model for the rest of Panama in ecotourism development and cooperation. Isla Palenque has received an ASLA award in planning, and has been recognized by the International Union for the Conservation of Nature (IUCN) (Amble, 2017). All development was done in care to preserve the rainforest and eliminate dependency for outside resources.

strategies for flamingo

Reduce the need for food imports by growing food on site. Include rainwater capture systems and utilize cistern storage. Integrate multi-story food gardens along trail networks. Reduce the road footprint and locate utilities underneath.



FIGURE 4.8: Jungle Rooms. (Amble Resorts, 2017)

INTERVIEWS

Two NPS professionals—Bob Showler, Flamingo’s District Interpreter and Fred Herling, Everglades National Park’s Planner—were interviewed on site. The interview style was conversational and informal so that open-ended questions could stimulate conversation about Flamingo, ecotourism, a new lodge, and the park’s visitors. Insight on the existing facilities, management, history, and future of the Flamingo district was gained from interviews.

INTERVIEW FINDINGS SUMMARY

From interviewing Mr. Herling, the NPS’s current plan for “rebuilding” Flamingo and the intent of the NPS’s call for concessioners were made clear. From interviewing Mr. Showler, day-to-day life at Flamingo, the people who visit, and the issues that the area is facing were better understood.

Both interviewees stated that Flamingo is a challenging place for development for several reasons: unreliable utilities and technology, unpredictable weather, and remote location. However, both professionals seemed hopeful in the new call for a concessioner to add lodging back to Flamingo—and both interviewees strongly emphasized the need for lodging.

Mr. Herling mentioned the park’s long term vision to become more sustainable by implementing a shuttle service to reduce carbon emissions. Mr. Showler explained the rich biodiversity of the Everglades and the unique wildlife and vegetation at Flamingo. He described that the environmental value of the area is often overlooked by visitors initially, and requires education and interpretation for guests. Both interviewees commented on Flamingo’s growing visitation numbers and diversifying visitor demographics despite the lack of lodging. Both interviewees agreed an ecolodge would be appropriate and likely successful at Flamingo.

These interviews generated invaluable background knowledge for this project that would have been impossible to gain through other research methods.

Key points and important quotes have been extracted from each interview. Full transcripts, the signed consent forms, and the IRB letter of approval can be found in Appendices C and D.

INTERVIEW: KEY POINTS

WHO: Bob Showler, District Interpreter

WHERE: Flamingo Visitor Center, January 5th, 2017

DURATION: 1 hour and 20 minutes

- Bob has been with Flamingo since 1979—and been full time for 8 years.
- There are currently 6 national park rangers in high season—this year there are staffing issues, usually it's higher.
- Now during peak season the NPS has 35 workers and Flamingo's concessioner employs 25. All seasonal staff lives on site.
- Flamingo has two common visitor types: day visitor, or long term visitor who stays for multiple days—up to two weeks.
- "The long term visitors are usually repeat visitors. Many are retirees from Miami and all over the States if they come by RV. Now we see more Asian visitors as well."
- For day visitors, there are a variety of people; from Americans to Germans, Chinese, and French. The visitor center has information brochures in 9 different languages.
- *"All the time we hear from visitors, 'So what's the deal? Are you going to get a new lodge down here?'"*
- After Hurricane Katrina, the road to Flamingo was closed for a few weeks, and the visitor center took even longer to get electric back. The restaurant, lodge was lost as well as the individual cottages.
- The busy time for Flamingo begins in October, peaks from Christmas to New Years, and then tapers off in March.
- *"But Flamingo is getting busier all the time. Last year we had a total of 180,000 visitors. In 2008 we didn't even have half as many!"*
- Flamingo is 50 miles from the closest town; it's wet, it can be infested with misquotes, it experiences rapid decay, technology fails often, there are issues with rodents and insects. "We have this expression; *'Oh, it's Flamingo.'* We're out in the subtropical wilderness; nature is constantly trying to get at us!"

- *"Flamingo has always been challenged. In my 38 years, I would say Flamingo, as National Parks go, has significant obstacles."*
- Sure buildings and infrastructure may be challenged, but nature is everywhere. That's why people come.
- *"I see an ecotourist as someone who goes to a lodge specifically to observe nature—that applies here at Flamingo."*
- The biggest issue Bob sees for implementing an Ecolodge at Flamingo is the issue of Sea Level Rise. The park has done an environmental assessment, and all new development will need to be elevated 13 ft above sea level to ensure safety for the next 50 years.
- The park has great economic value for southern Florida. Millions of dollars are generated in the communities at the park's edges through lodging, restaurants, and other services for park tourists.
- "As a National Park, Flamingo requires explanation. People come down here saying, "This is a National Park?!" Then I take them around to see some stuff that they can't see anywhere else in the country and then they begin to get it. It really requires more of a narrative."
- *"In this little tiny sliver of land at the very southern tip of Florida you have more unique life than you might have in the entire state of Alaska or Montana. It is a fascinating place and there is so much to share with the public."*

INTERVIEW: KEY POINTS

WHO: Fred Herling, Park Planner

WHERE: Rosita's Cafe, Florida City, January 6th, 2017

DURATION: 1 hour and 30 minutes

- Fred has been the Park Planner for 15 years.
- It took multiple years for Flamingo to be “normal” again.
- Mud wash up was big problem after Katrina. Excess mud and dredging from the Marina was reused to regrade the walk-in tent area and was done maintaining or shrinking the district's footprint.
- There has been a masterplan done since Hurricane Katrina which had many ideas, but some of that has been cut out to be more realistic for a concessioner.
- *“Lodging, a restaurant, and other basics that were destroyed by the hurricane should be the project priorities that come first for the public.”*
- Whoever becomes the new concessioner will take over the current concessioner services, new building projects (the lodge) and management of the campgrounds at Flamingo and Long Pine Key.
- All the risk factors that come into play for building at Flamingo make it a challenge to attract a concessioner. A company can operate at any other National Park with a lot less uncertainty than here.
- *“The deadline for the current prospectus closed this month. It has been 11 years since Katrina now, so we are hopeful to find a new concessioner. The public is frustrated. We are frustrated.”*
- International visitation is bigger than ever before for the Everglades National Park; Germany, France, England, China, and Japan especially. The baby boomer population also has large presence at Flamingo—most of whom use the RV camp area.

- *“Many of the people staying in Florida City are commuting to Flamingo. Obviously, you can stay if you have an RV or tent—but many people don’t have that.”*
- Our consensus is that the lodge option needs to come back. Flamingo is the only place in the park where people can stay overnight that isn’t backcountry camping. It appeals to a wide range of visitors. But the lodge should have a small footprint and should reduce environmental impacts.
- The park is calling for a simple and basic lodge style. No pools, hot tubs, or fancy resorts. The public has said to us, “we want clean, comfortable, basic lodging.” The idea is to create another accommodation option for Flamingo guests.
- *“Our vision for the new lodge is to be less like a motel [as it was in the past], and more cabin style. Elevated rooms that may be organized in four or six-plex*

building pods with one central lodge.”

- The park has considered a bus and shuttle service to limit fossil fuel use. But that won’t become reality until after a lodge is built.
- If people had a lodge and a shuttle service, they would be investing in the local restaurant, wouldn’t be burning fossil fuels everyday, and would receive a more meaningful overall experience.
- *“An ecolodge doesn’t exist anywhere else that I know of, so I think it could work well for Flamingo. Here you already have the chance to stay in a park, an hour from any developed area....you just can’t get that experience anywhere else in the rapidly developing region of south Florida.”*
- “If you [or the products of this master’s report] generate some good ideas, I think those should potentially be available for Flamingo’s future concessioner.”

SITE ANALYSIS & ON-SITE OBSERVATION

The Flamingo lodge site is analyzed at three different scales: regional, district, and site. The goal of this research method is to understand Flamingo's opportunities and constraints for the design of an ecolodge.

The On-site observation research method is combined with this site analysis research method to better communicate the qualities of the region/district/site. A site visit to Flamingo was conducted January 4-6 2017. Bob Showler, the Flamingo District Supervisor, was the guide for this visit. Key photos taken on site and written observation from the site visit are included in analyses. The following pages show maps, photographs, and written observations at each scale of site analysis.



FIGURE 4.9: Mangrove Trees at Flamingo (Steward, 2017)

REGIONAL ANALYSIS: CONTEXT

The Everglades National Park is the largest National Park East of the Rocky Mountains and is also a World Heritage Site, and International Biosphere Region (U.S. National Park Service, 2016). This largely wetland park covers 1.5 million acres of land and is home to 8 distinct ecosystems according to the NPS. The park is bordered by Everglades City and Naples to the northwest, Fort Lauderdale and Miami to the northeast, Homestead and Florida City to the east, and Key Largo to the south. Although southern Florida is known for rapid development, the large central area of the Everglades remains largely untouched and inaccessible. The Main Park Road, or State Highway 9336 is the single road that runs through the park. This two-lane road begins at the park entrance passes a few small hiking loops, picnic spots, and canoe drops, and ends at the final destination; Flamingo. At one time Flamingo was the only full service NPS location in the entire Everglades National Park: marina, campground, food, boat launch, gas service, picnic areas, and lodging. Today, the only service missing is lodging.



FIGURE 4.10: Florida Bay (Steward, 2017)

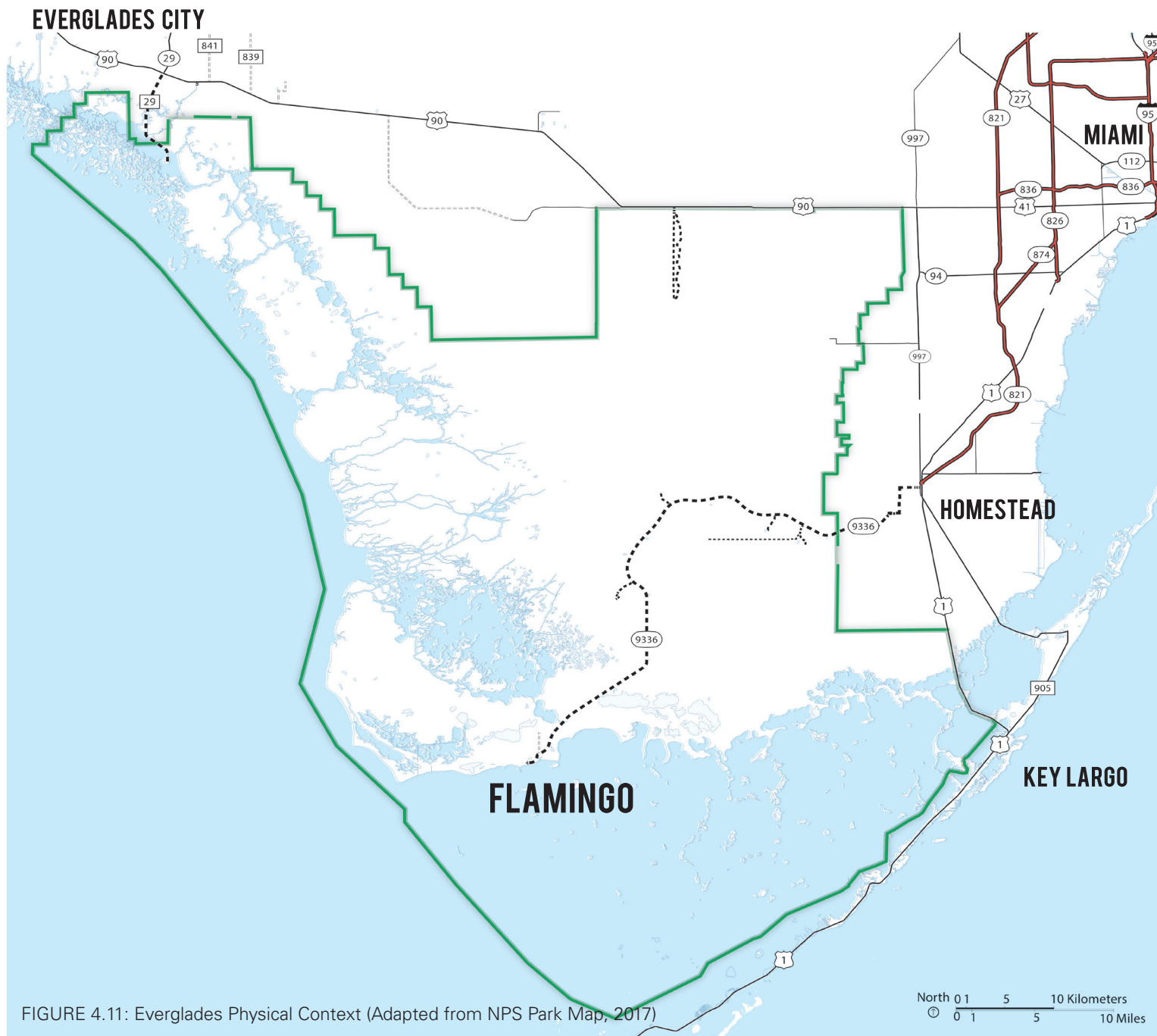


FIGURE 4.11: Everglades Physical Context (Adapted from NPS Park Map, 2017)

REGIONAL ANALYSIS: HYDROLOGY

The native people of the Everglades, the Miccosukee Tribe, refer to the Everglades as “Pa hay okee” or “grassy water” (Lodge, 2005). The Everglades is a vast and unique wetland system. In fact, in terms of hydrology and functioning, the Everglades is unique from every other wetland system in the world. Instead of relying on rivers or streams as their main source of nutrients like all other wetlands, the Everglades relies solely on nutrients from the atmosphere, specifically from rainfall (Lodge, 2005). A slough, or “low-lying area of land that channels water”, is the closest thing to a river in the Everglades (Everglades NPS, 2017). These sloughs move water very slowly, only 100 feet per day. Along the Everglades coastal edges saltwater creeps its way up into the park’s many canals streams and ponds. This brackish water is necessary for mangrove ecosystems and crocodile habitat. Along the west border of the park ocean water depth remains relatively deep and constant. Along the east and especially south borders of the park however, water depth is very shallow and there are many small islands or keys. At Flamingo’s marina a brackish water canal is accessible on one side and the saltwater of Florida Bay is on the other.



FIGURE 4.12: Florida Bay Beach (Steward, 2017)



FIGURE 4.13: Fresh Water Pond (Steward, 2017)

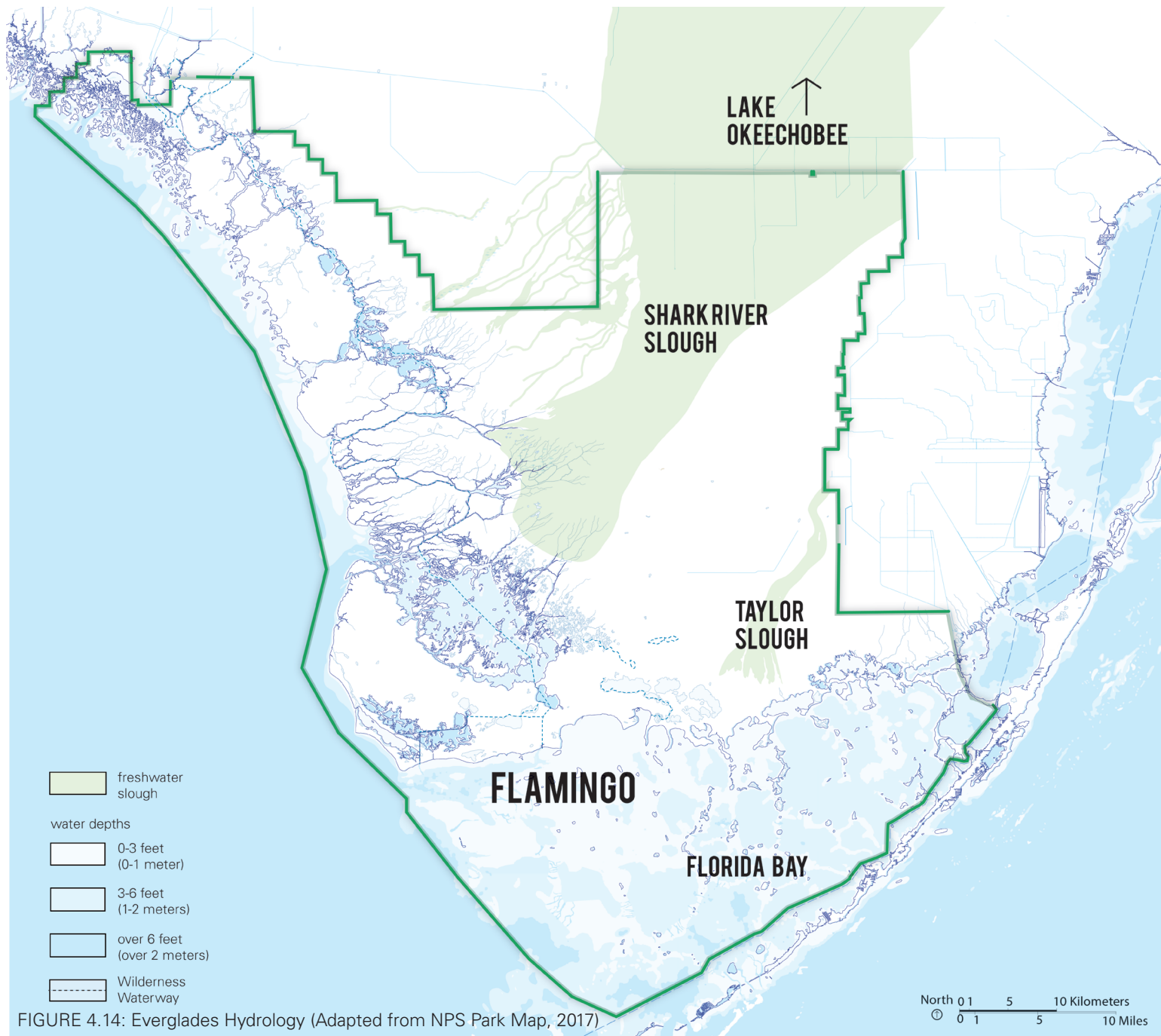


FIGURE 4.14: Everglades Hydrology (Adapted from NPS Park Map, 2017)

REGIONAL ANALYSIS: ECOLOGY

As earlier stated, the Everglades is a unique wetland environment. In most basic terms, wetlands can be seen in two main categories: swamps or marshes. Typically a swamp is characterized by the domination of trees, whereas marshes are covered in lower growing herbaceous plants or grasses (Lodge, 2005). As defined by the National Park Service, there are 8 different ecosystem types found in the Everglades: Coastal Marsh, Mangrove, Cypress, Coastal Prairie, Freshwater Slough, Pinelands, Freshwater Marl Prairie, and Hardwood Hammocks. Water salinity determines the appearance of the landscape in the Everglades. As can be seen in FIGURE: 4.15, salt or brackish water systems dominate the west border of the park, freshwater sloughs run through large areas of freshwater marl prairie, and cypress, pinelands and hardwood hammocks are somewhat sprinkled through the freshwater areas.

The drive on main park road to Flamingo is dynamic; the scenery alternates between sweeping views across grasslands, to enclosed tree walls and canopy, to sporadic islands of small pines and twiggy cypress, to dense mangrove forest at the end. This main park road in fact leads through or just adjacent to all 8 of the park's different ecosystems. The mixing and sprinkling of different ecosystems creates an almost bizarre first

visual experience for visitors. Everglades National Park, like all National Parks, is valuable in its ability to serve as a teaching tool for all those who experience it. Bob Showler, Flamingo's District Interpreter, describes the environmental value of the park in this way:

"In this little tiny sliver of land at the very southern tip of Florida you have more unique life than you might have in the entire state of Alaska or Montana. It is a fascinating place and there is so much to share with the public."

Wet seasons and dry seasons create different cycles for the Everglades. In the coastal ecosystems, wet state to dry state shifts daily with tides. But for the larger majority of the park wet season versus dry season is defined by hydroperiod, or an annual period of continuous flooding (Lodge, 2005). At Flamingo the two ecosystems present are mangroves and coastal prairie. The slightly elevated (merely 2 or 3 feet of change) coastal prairie ecosystem compared surrounding mangroves has dictated the buildable area and positioning of Flamingo's buildings and road.

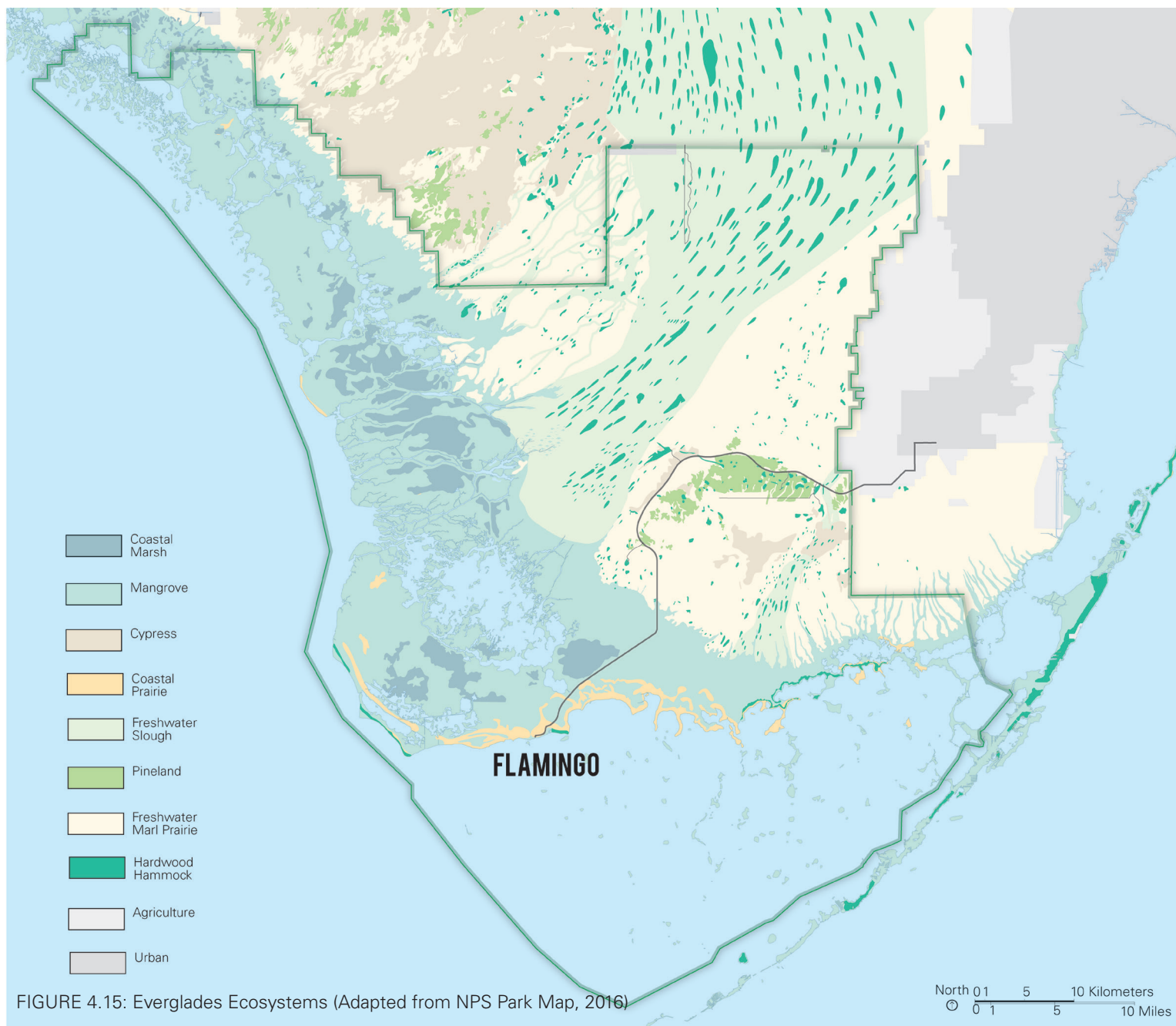


FIGURE 4.15: Everglades Ecosystems (Adapted from NPS Park Map, 2016)

REGIONAL ANALYSIS: RECREATION

The Everglades National Park offers many opportunities for recreation. Boating, kayaking or canoeing, paddle boarding, hiking, tent camping, RV camping, backcountry camping, bird watching, and picnicking can all be done at the Everglades. Water recreation however is more common because of the park's wetland quality.

The wilderness waterway running along the west side of the park (see FIGURE 4.18) is a 99 mile water trail for paddlers and small boats. This voyage through mangroves and coastal marsh offers almost complete solitude and untouched wild for travelers. However, paddlers must be experienced and obtain a permit before beginning the multiple day journey and nights spend backcountry camping (Everglades NPS, 2017). For less physically intense recreation, bird watching is great in the Everglades for the enormous flocks and varieties of wading birds. Because of the park's marsh-like quality, long hiking trails do not exist, but there are many shorter hiking loops at stops along the main park road and the park's border. Seasonality is a major determinant of recreation activity. December to April is the cooler and drier months which make for a more pleasant experience compared to the hot, sometimes stormy, mosquito swarmed period from June to October (Everglades NPS, 2017).



FIGURE 4.16: Buttonwood Canal (Steward, 2017)



FIGURE 4.17: Bird Watching Opportunities (Steward, 2017)

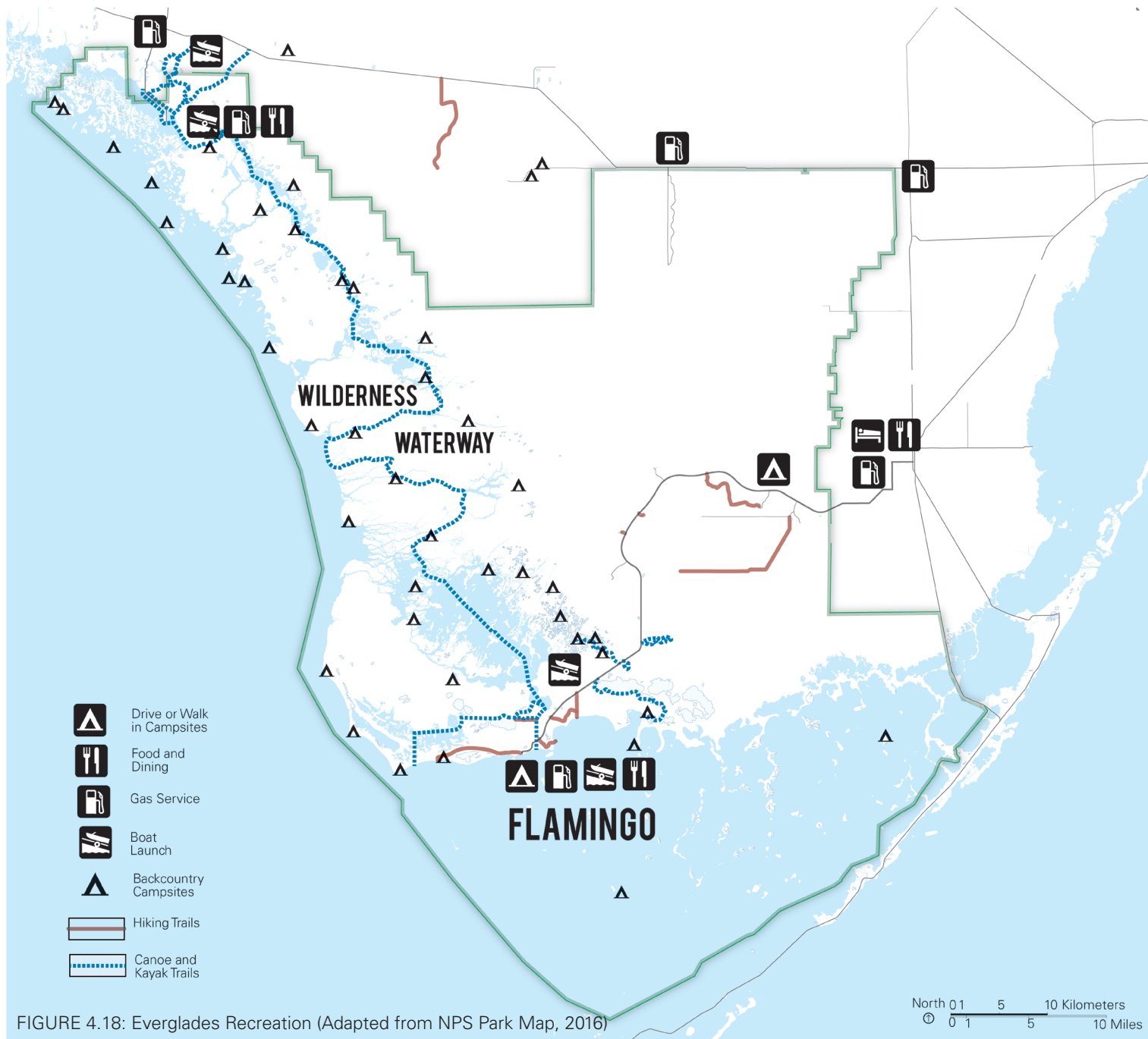


FIGURE 4.18: Everglades Recreation (Adapted from NPS Park Map, 2016)

REGIONAL ANALYSIS: ACCESS

Between the rapidly developing urban edges of southern Florida lies the vast expanse of the Everglades wilderness. This void of human development is an attraction factor for many visitors to see undisturbed landscape and wildlife. However, accessing Flamingo is no small commute as it takes almost an hour just from the park's border. Florida City is the closest community to Flamingo, and many visitors find accommodations here and commute in and out every day. For international travelers, the journey to Flamingo is lengthy. The driving time from southern Florida's three largest international airports can be seen in FIGURE 4.19.

Although commuting from accommodations may not be ideal for all visitors, the park has great economic value in these surrounding cities and brings in millions of dollars for the communities through lodging, restaurants, and other attractions. Bob Showler, Flamingo's District Interpreter commented. Flamingo's remoteness poses challenges for development as "there are many risk factors that come into play" in attracting a concessioner to take over operations and rebuild Flamingo's lodge (Herling, 2017).

Yet the need for accommodations is apparent and growing. Showler claimed that the park is receiving more and more visitors every year, and that the annual total in 2016 was more than double that in just 2008. Fred Herling, the park's planner also pointed out that international visitation is bigger than ever before. International travelers would benefit from the opportunity to stay overnight at Flamingo as they are perhaps the least able to arrive with all the necessary supplies and gear to camp.

Large numbers of commuters in the park has adverse effects in terms of the environment; burning and releasing of fossil fuels, higher wildlife/car accident probability, and nighttime noise and light pollution. Programmatically, a shuttle system would work as a sustainable transportation solution for visitors headed to Flamingo or other stops along the park road. In fact, the park has considered a bus and shuttle service to limit fossil fuel use, but Herling stated that this will not become reality until after a lodge is built and operating at Flamingo.

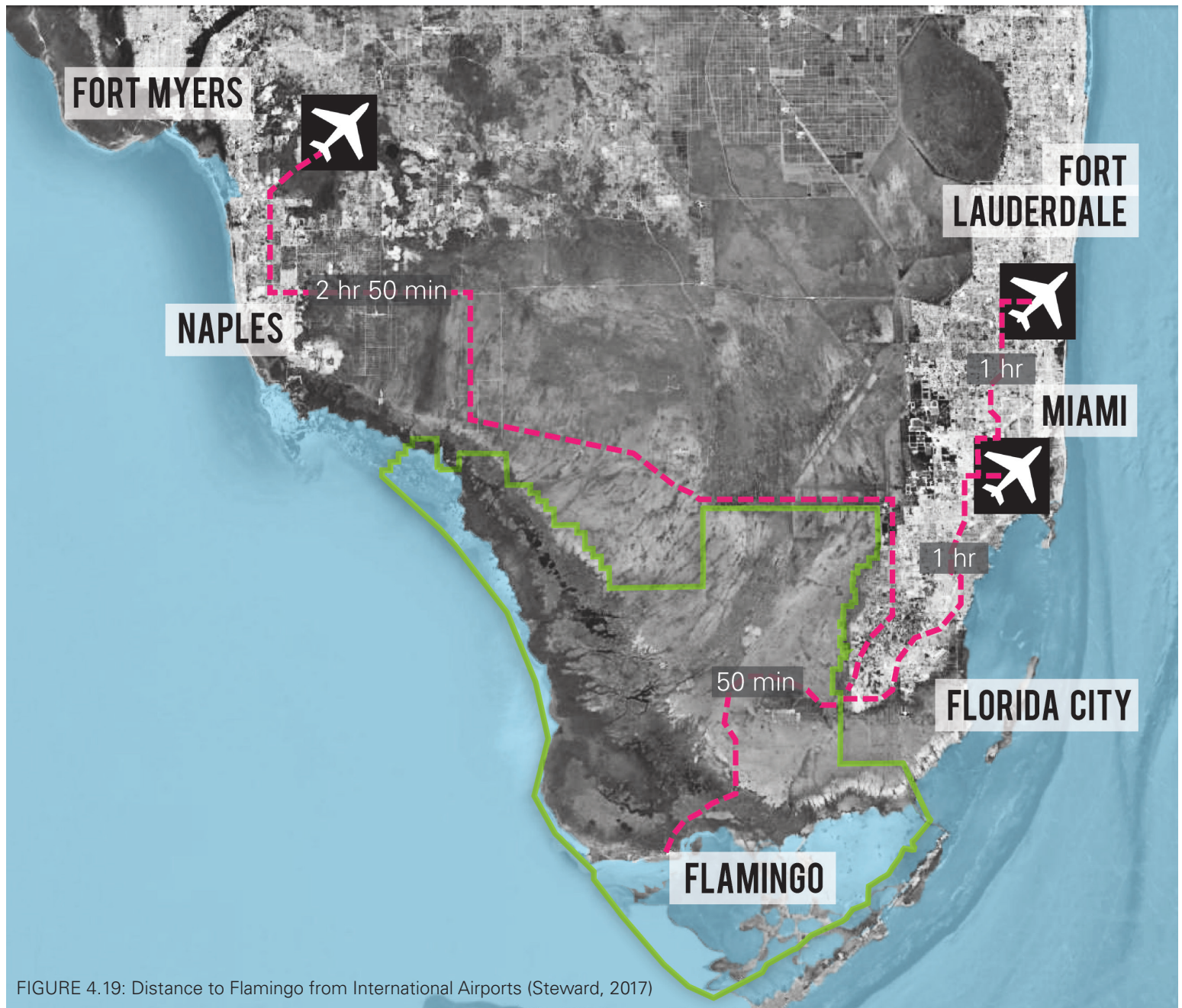


FIGURE 4.19: Distance to Flamingo from International Airports (Steward, 2017)

REGIONAL ANALYSIS: SUMMARY

Understanding the Everglades National Park, or the region that surrounds Flamingo is important in developing background knowledge for designing a sustainable ecolodge site at Flamingo. The Everglades national park is climatically intense, remote, rich in biodiversity, and wild. Analysis of the park's hydrology and ecosystems reveals the seasonality or dynamism of the area that is important to consider during the project's site suitability analysis, planting design, and building placement. Analysis of the park's recreation will have influence when determining the Flamingo lodge's project programming and considering the needs of the tourists. Analysis of the park's access is evidence of the true need for a lodging project at Flamingo.

The maps and information on the pages to come zoom way down in scale to the masterplan of Flamingo. At this scale, detailed observations and more specific analysis can be made about Flamingo overall as a district.

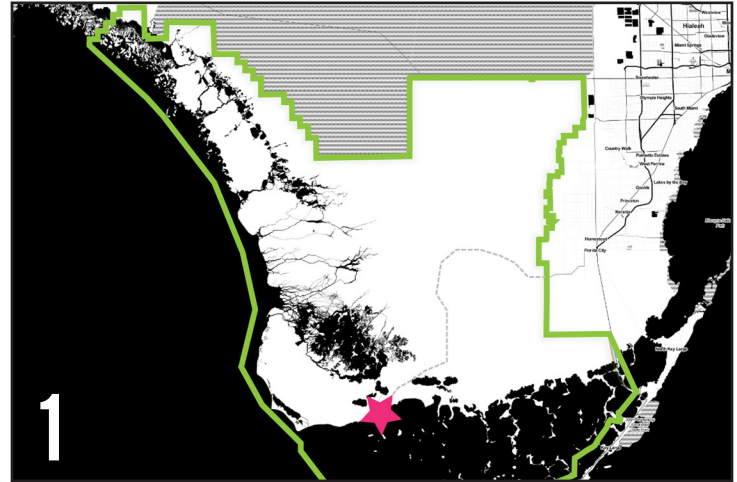


FIGURE 4.20: Transitioning from Region to Site: NPS Boundary
(Adapted from Creative Commons Maps, 2017)



FIGURE 4.21: Transitioning from Region to Site: South Everglades
(Adapted from Creative Commons Maps, 2017)

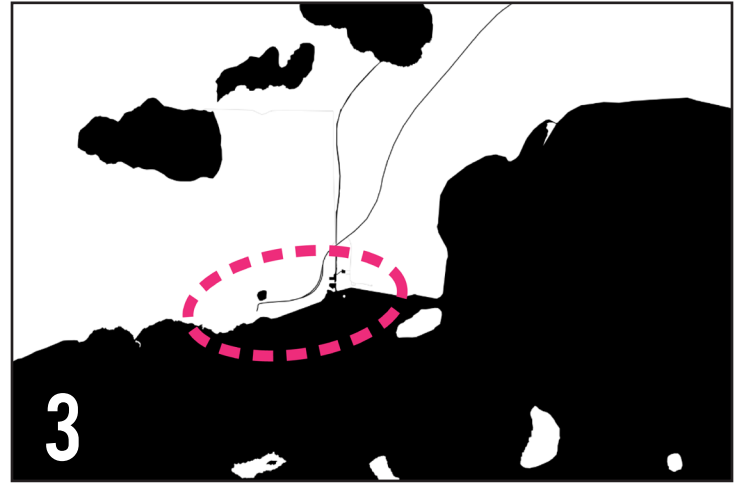


FIGURE 4.22: Transitioning from Region to Site: Florida Bay
(Adapted from Creative Commons Maps, 2017)



FIGURE 4.23: Transitioning from Region to Site: Flamingo District (Steward, 2017)

DISTRICT ANALYSIS: CONTEXT

Flamingo is known as the gateway to Florida Bay where a mixture of marine wildlife and mangrove habitat up through the connecting canals can be seen. Amenities at Flamingo include the National Park visitor center, campground facilities for RVs, drive in, walk in, and group campers, a public boat ramp, a marina store, gas service, and café. Services or recreational opportunities found at Flamingo include educational displays at the visitor center, NPS ranger-guided programs or tours, backcountry permits, boat tours, and canoe, kayak and bicycle rentals.

Although visitors move freely through the district, the management of the park is broken into two categories: the National Park Service and the current concessioner. The NPS oversees the camping areas, visitor center, backcountry permits, and ranger-guided programs. The park's current concessioner manages the marina, café, boat tours, and rental services. For both the NPS and Concessioner's seasonal staff there is on-site housing on the east edge of the site.

The current void along the shoreline (see FIGURE 4.24) between the camping areas and visitor center is where Flamingo's lodge and cabins once stood. The area in white is the site used for design in Chapter 5.

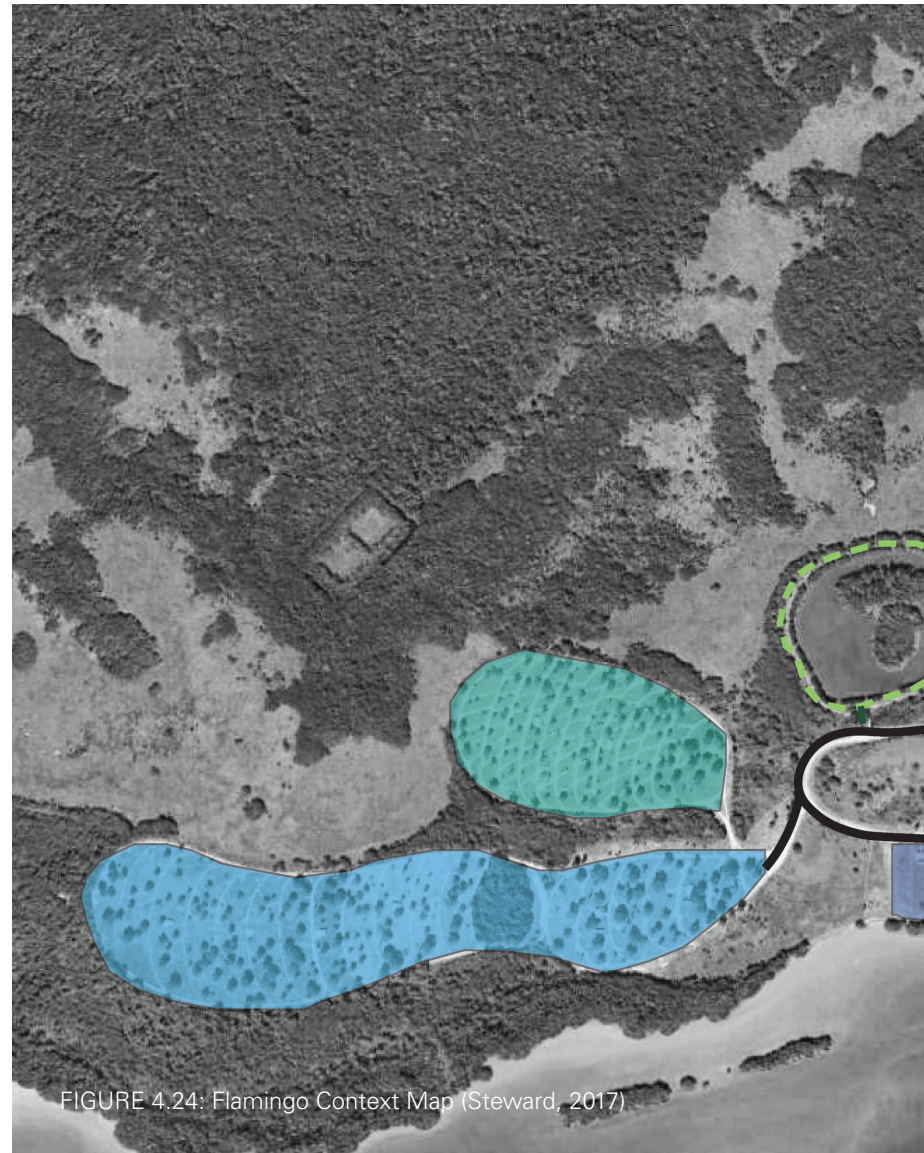
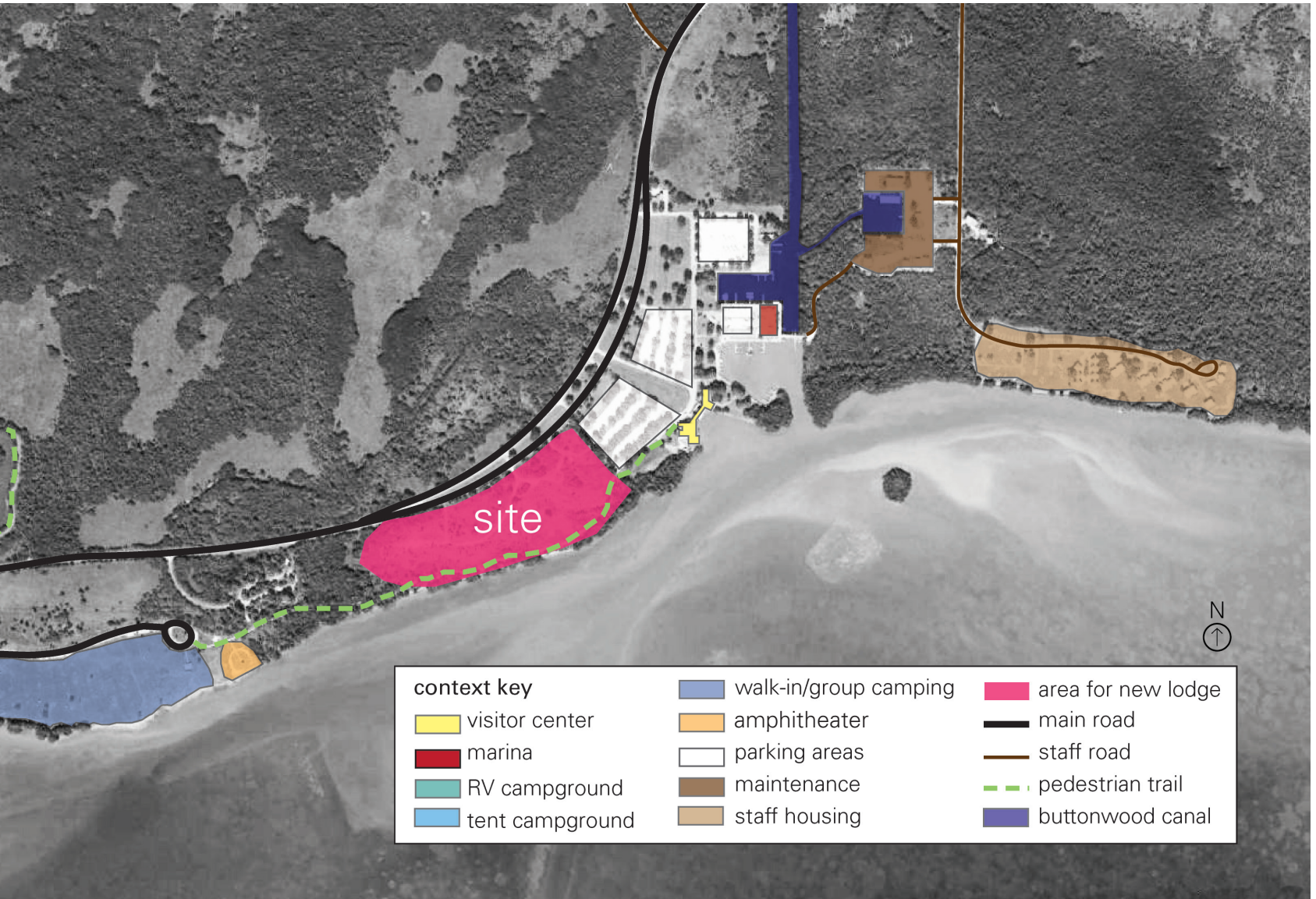


FIGURE 4.24: Flamingo Context Map (Steward, 2017)



DISTRICT ANALYSIS: CONTEXT

The images below were taken on-site and correspond with the different services and amenities on context map, FIGURE 4.24, on the previous page. All photographs were taken by the author.



FIGURE 4.25: Flamingo Entrance



FIGURE 4.26: Visitor Center



FIGURE 4.27: Visitor Center Interior



FIGURE 4.28: Amphitheater



FIGURE 4.29: Outside Buttonwood Cafe



FIGURE 4.30: Boat Tour and Kayak



FIGURE 4.31: Eco Pond Trail Entrance



FIGURE 4.32: View out to Florida Bay



FIGURE 4.33: View to Marina and Rentals



FIGURE 4.34: Marina and its Parking Lot



FIGURE 4.35: Drive-In Camping Area



FIGURE 4.36: RV Camping Area



FIGURE 4.37: Walk-In Camping Area



FIGURE 4.38: Previous Lodge Site



FIGURE 4.39: Staff Housing Area



FIGURE 4.40: Group Camping Area

DISTRICT ANALYSIS: PROGRAM

The site of the Flamingo district is arranged linearly along the shoreline of Florida Bay. The district is sited on open coastal prairie. Mangroves enclose the district and can be explored up the Buttonwood canal.

There are currently in the district three different zones or program areas that can be seen in FIGURE 4.41. The central zone is for day use. The visitor center, marina, boat tours, rentals, food service, and parking are all located here. This is the main hub of activity in Flamingo. The large zone to the west serves as an overnight area for camping and RV visitors. These camping areas are connected by the main park road. And each area has rest rooms, solar-heated showers, picnic tables, and fire pits. This area is usually much quieter during the day than the central day use zone. To the west, an overnight zone provides accommodation for staff. Mostly seasonal staff live here but some year-round staff live here as well. The area outlined in pink shows the proposed use for the project site. Once a lodge and restaurant is built in this location, the activity in this zone would likely be moderately busy as a mix of overnight visitors and day visitors would be accessing the site.

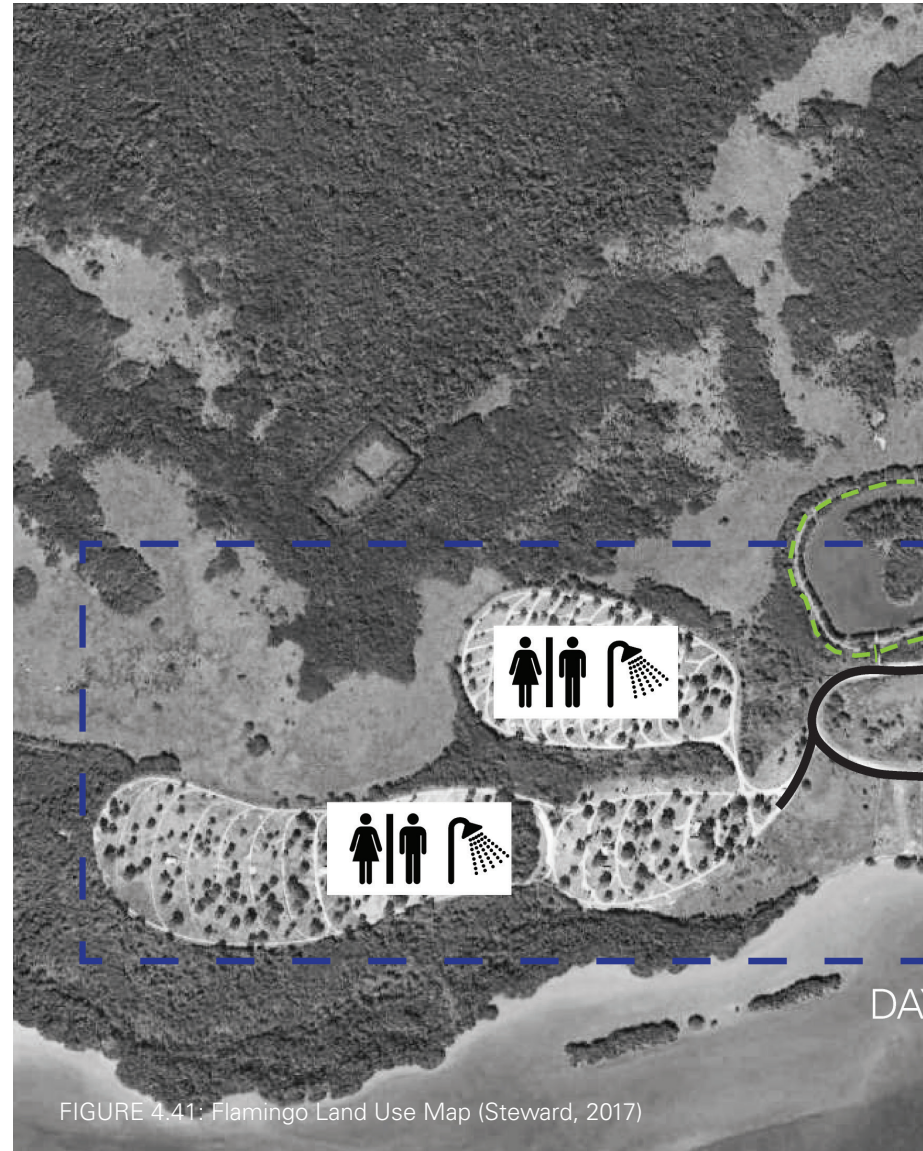
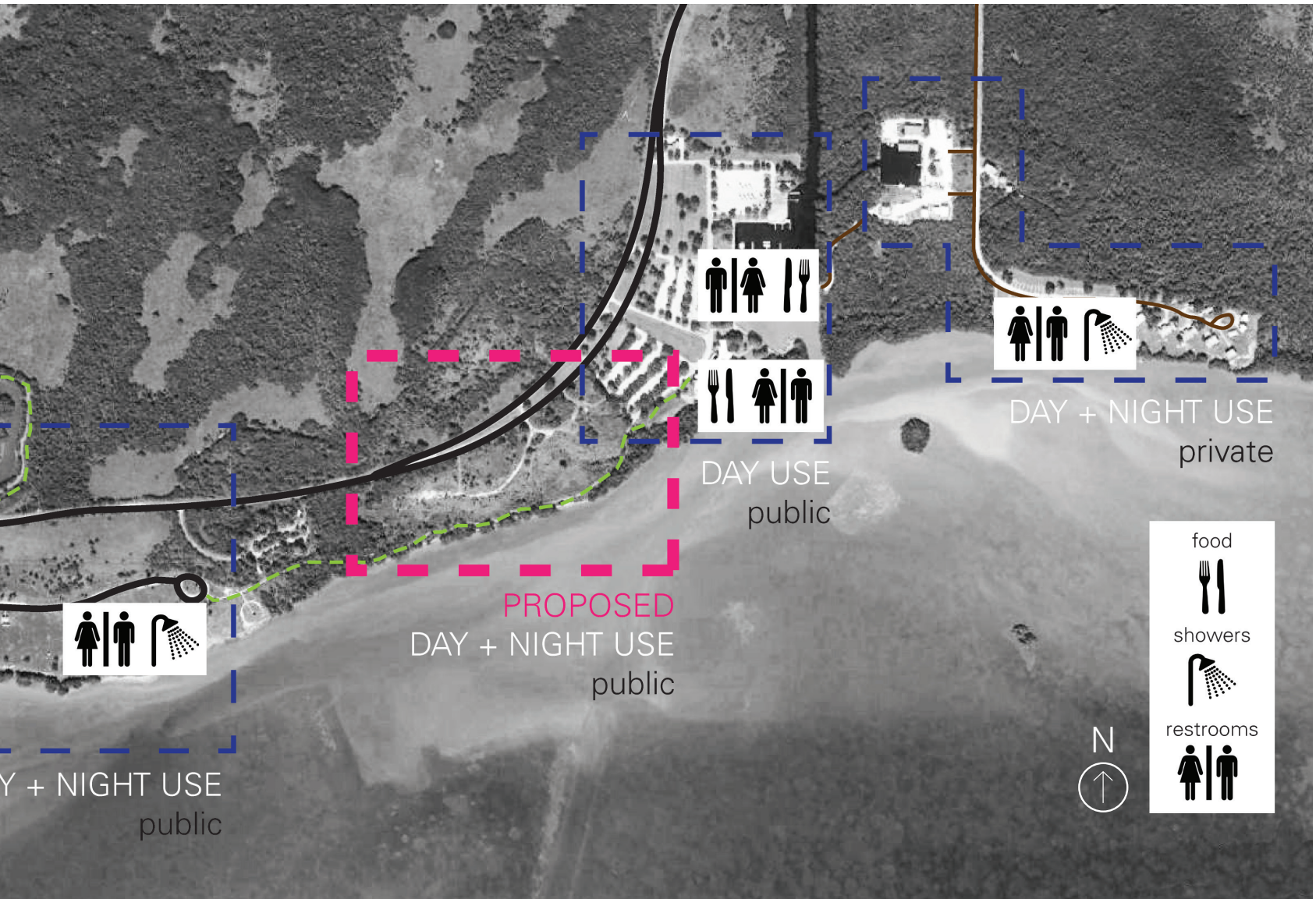


FIGURE 4.41: Flamingo Land Use Map (Steward, 2017)



DISTRICT ANALYSIS: PROGRAM

In the districts existing two public zones different services and amenities can be found. The day use area is busy. Kayaks and canoes are gone early in the day and the cafe will fill during peak seasons and hours. The overnight zone is much quieter, but provides necessary amenities for campers. The solar technology seen in FIGURE 4.43 is used at all shower sites to sustainability heat shower water.



FIGURE 4.42: Buttonwood Cafe (Steward, 2017)



FIGURE 4.43: Solar Technology to Heat Camp Showers (Steward, 2017)



FIGURE 4.44: Canoe and Kayak Rental Area (Steward, 2017)

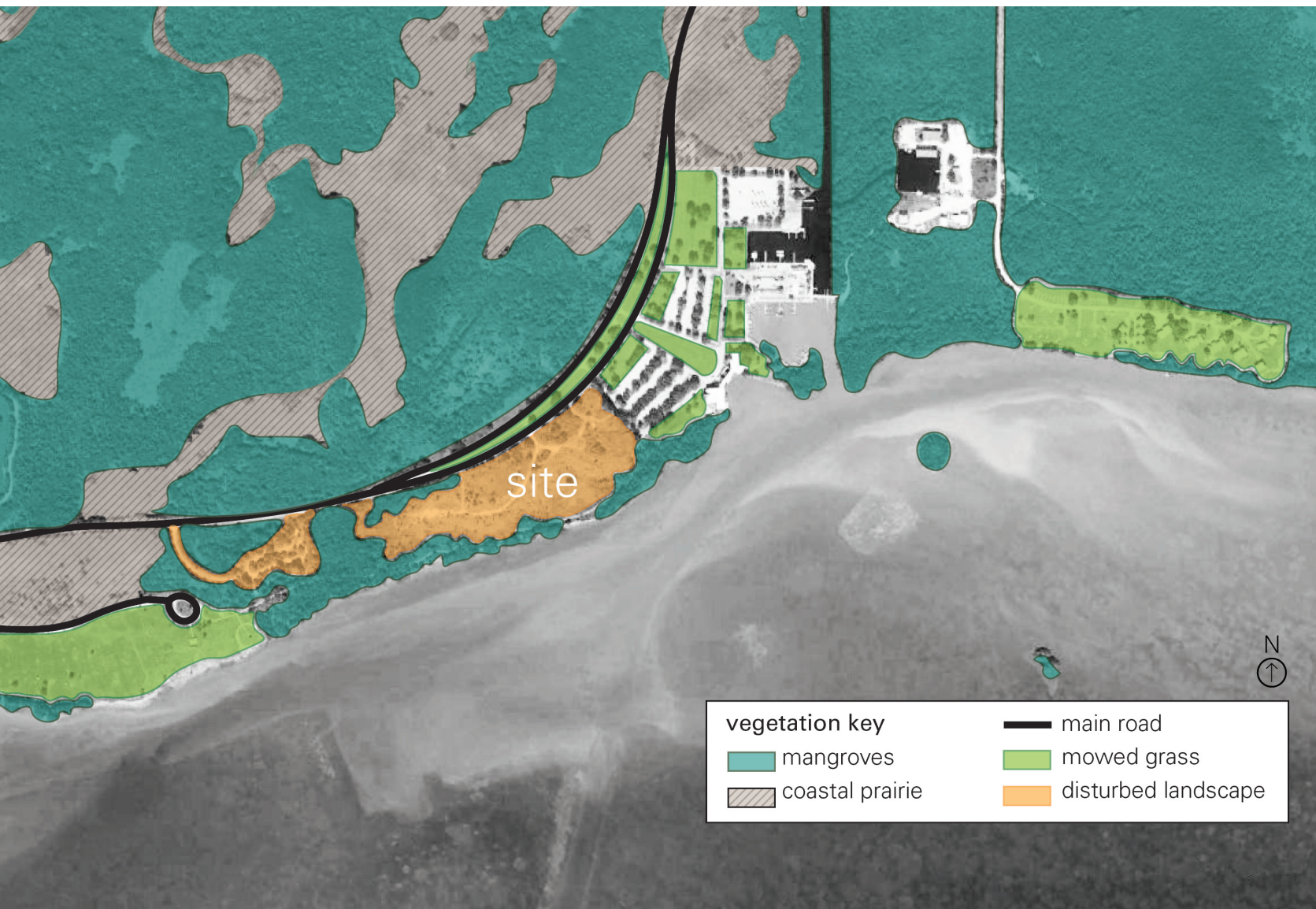
DISTRICT ANALYSIS: VEGETATION

The ecosystems in the Flamingo district are coastal prairie and mangrove forest. Mangroves line most of the shoreline at Flamingo and enclose boaters or paddlers as they travel up the Buttonwood canal. Within Flamingo's different program areas (marina, camping loops, visitor center, parking lots, etc.) planting design is simple: mowed turf grass, shade trees, and limited tropical landscaping around the visitor center. Native vegetation of mangroves and coastal prairie is integrated into the site between program areas.

In orange (see FIGURE 4.45) are areas that were once the site for Flamingo's lodge and cabins. The vegetation in this area is in the process of transition back to native amongst the remnants of crumbling roads and building foundations. During this project's site suitability design, new trees and existing mangroves will be protected. To align with SITES principles and Ecolodge criteria, care will be taken to preserve all trees possible and conserve native vegetation and fragile topsoil when designing the site.



FIGURE 4.45: Flamingo Vegetation Map (Steward, 2017)



DISTRICT ANALYSIS: VEGETATION & WILDLIFE

The images on this page show designed and native landscapes at Flamingo as well as some wildlife commonly seen in the area.

The disturbed landscape in Flamingo's previous lodge and cabin locations in FIGURE 4.46 has regrown quickly in the last 11 years. Many of these new trees are well over 15 feet tall. FIGURE 4.47 shows the typical mowed turf grass, shade trees, and drives or parking lot environments common around the marina and visitor center, and RV and drive-in camping areas.

Flamingo is an ideal place to see wildlife of all varieties. Up the Buttonwood canal in brackish water live manatees and American crocodiles. The American crocodile, which is considered extremely rare in Florida, can be seen regularly in the canal or out warming themselves up on the concrete plug between the canal and Florida Bay (only a few yards from the Marina). Birds of all sizes are seen throughout Flamingo. The district's Eco Pond area, located to the east of the camping loops is one of the best places for bird watching. In FIGURE 4.51 an osprey, or large bird of prey, has made its nest in a tower just next to the marina for all visitors to see.



FIGURE 4.46: Vegetation at Old Lodge Site (Steward, 2017)



FIGURE 4.47: Shade Trees, Turf, and Parking (Steward, 2017)



FIGURE 4.48: Mangroves (Steward, 2017)



FIGURE 4.49: Young American Crocodile (Steward, 2017)



FIGURE 4.50: Manatee in Buttonwood Canal (Steward, 2017)



FIGURE 4.51: Osprey Nest (Steward, 2017)

DISTRICT ANALYSIS: SUMMARY

Mapping and analysis at the district's masterplan scale contributes valuable and necessary information for designing a sustainable ecolodge site.

Analysis of the district's context shows what is available at Flamingo and what is lacking in terms of visitor experience. Photos from the site communicate the existing facilities and overall visual quality or feel of the site. Analysis of the district's program is important in understanding the way different areas of the site are being used and how they could be better connected through adding a lodge. Analysis of the district's vegetation identifies the natural and designed areas of vegetation—this will be important when deciding what should be preserved or restored during the site suitability design process. Wildlife seen while on site is noted and creating habitat for these species, especially birds, will be considered during design.

It is important to understand the context, program, and vegetation types of the entire Flamingo district before beginning the site design process in Chapter 5.



FIGURE 4.52: Visitor Center Entrance (Steward, 2017)

SITE ANALYSIS: SITE IDENTITY

The site for this sustainable ecolodge project is 17.25 acres located in the center of the larger 150 acre Flamingo District. The site has been unused since hurricane Katrina in 2005 and all of the lodge's previous structures have been demolished. However, an eroding road, many trees, and other overgrown vegetation from the old lodge remain. The site's greatest amenity is direct views and access to Florida Bay along the south edge.



FIGURE 4.53: Overgrown Vegetation at Lodge Site (Steward, 2017)



FIGURE 4.54: Florida Bay Views at Lodge Site (Steward, 2017)



SITE ANALYSIS: SITE INVENTORY

During the site visit in early January of 2017, photos were taken by the author as a way to document the site and gain a better understanding the quality of the place. Photos to the right show views of key points throughout the site and connect those points back to the aerial map.



FIGURE 4.57: Existing Palm Trees from Previous Lodge



FIGURE 4.58: Eroding Road



FIGURE 4.61: Mangrove Edges along Shoreline



FIGURE 4.63: Primary South View to Florida Bay



FIGURE 4.64: Lodge Site Aerial Map (Steward, 2017)



ad and Overgrown Vegetation



FIGURE 4.59: View into Site from the Main Park Road



FIGURE 4.60: Various Vegetation found on Site

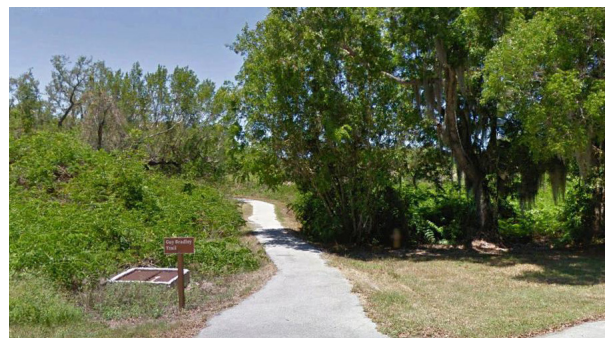


FIGURE 4.62: Guy Bradley Trail from Visitor Center



FIGURE 4.65: Northwest View from Trail into Site

SITE ANALYSIS: DIAGRAM

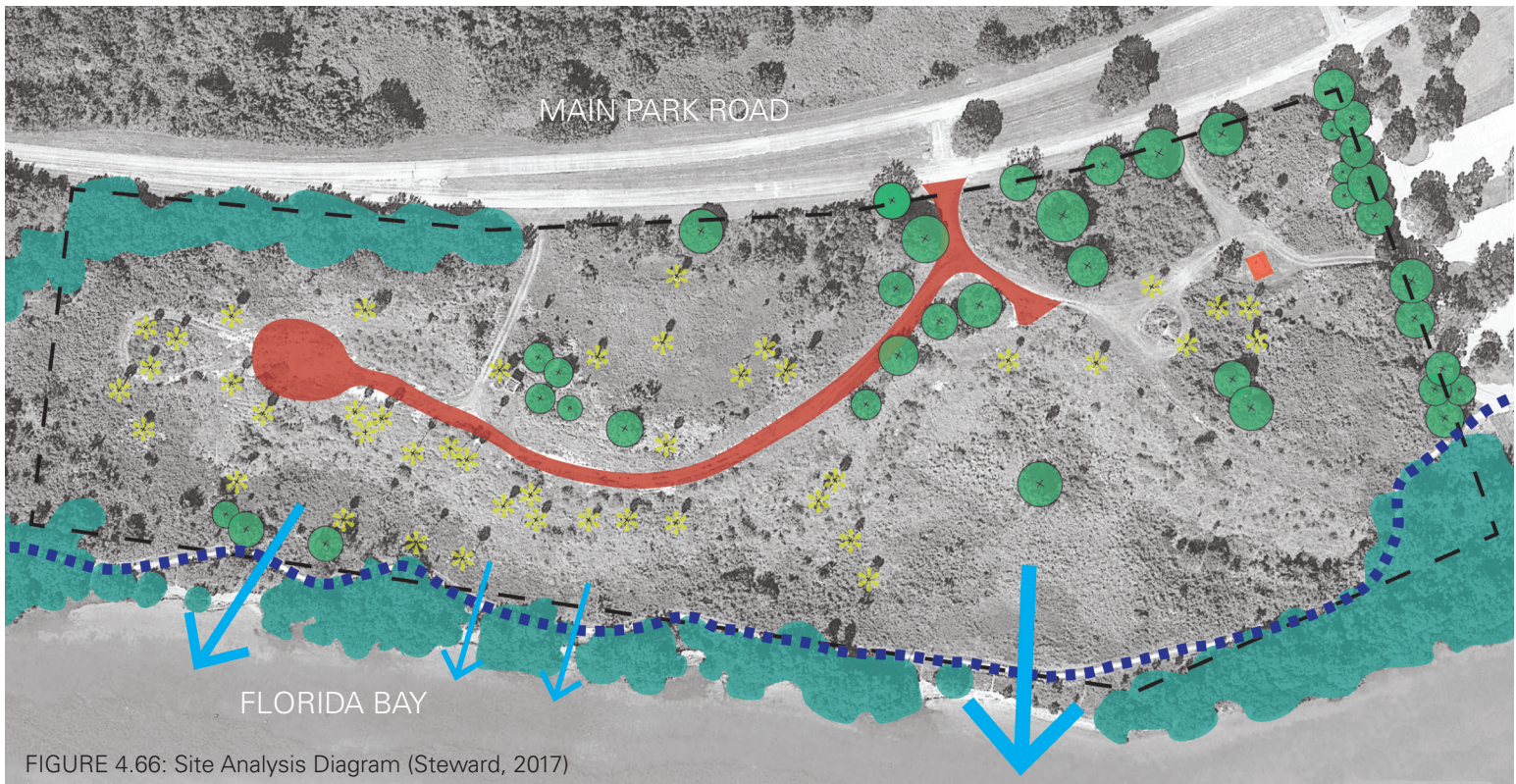


FIGURE 4.66: Site Analysis Diagram (Steward, 2017)

SITE ANALYSIS: OPPORTUNITIES & CONSTRAINTS

SITE OPPORTUNITIES:

1. **FLORIDA BAY VIEWS:** Existing views framed by mangroves should be reserved for ecolodge structures or important gathering spaces.
2. **GUY BRADLEY TRAIL:** This active trail along the south side of the site is an opportunity to increase the lodge's connectivity to the District.
3. **OPEN SPACE--SOLAR COLLECTION:** Dense native vegetation occurs along the site's edges, but grasses and ground-covers occupy most of the central area of the site. This will be appropriate for solar water heating technologies.
4. **EXISTING VEGETATION:** Both native species and landscape trees from the previous lodge are present on-site. Thick native tree stands of mangroves, ironwood, and Jamaica dogwood are found along the site's south and northwest edge. Through the middle of the site are thatch palms, shade trees like Caribbean mahogany, and grasses and ground-covers like sea grape.
5. **RICH BIODIVERSITY & WILDLIFE:** Flamingo is a wild place. Visitors see many different animal species on a regular basis. There is an opportunity to increase tree cover on site to encourage more wildlife on the site--an attractive feature for the ecotourist!

SITE CONSTRAINTS:

1. **ERODING LODGE ROAD:** Unlike the previous lodge's buildings, the asphalt road has been left to crumble. This road will either need to be removed or heavily restored for use at the new lodge.
2. **HIGH WATER TABLE:** The average water table depth is 14 inches during the dry season, and 10 inches during the wet season. This prevents sustainable development opportunities like septic tanks and creates problems like mosquitoes infestation, flooding potential, and disease or mold prone vegetation. For this reason construction should occur only during the dry season, and ground level development should be minimized.
3. **EXISTING LIFT STATION:** This is an active lift station necessary in the handling of Flamingo's sewage system. This station will need to be visually screened from lodge buildings but still physically connected for service access.
4. **SOILS:** The four soils found at Flamingo are marl, peat, sand, and rock outcroppings. None of these soils are stable for development. Therefore some disturbed compacted fill soil exists on the site, and more will need to be added for the construction of structures, roads, and paths. Bedrock is soft limestone found 10-40" below the soil surface.

SITE ANALYSIS: SUMMARY

Inventory and analysis at the site scale contributes specific and necessary information for designing an ecolodge at Flamingo.

Analysis of the site's size puts the project in context within the district. Photos taken on-site communicate the existing conditions and overall feel of the site as well as what the current access points on the site look like. The site analysis diagram is important to quantitatively and spatially show existing: vegetation, utilities, circulation paths, and views on site. Analysis of the site's opportunities and constraints reveal information needed for the design process of this project. The purpose of site analysis is to directly inform decision making of the site.

It is important to analyze the site's size, physical qualities, existing conditions, spatial qualities, and opportunities and constraints before an ecolodge design program can be developed.



FIGURE 4.67: Flamingo Lodge Site (Steward, 2017)



FIGURE 5.0: Flamingo's Group Camping Area (Steward, 2017)



05

DESIGN

ECOLOGDE DESIGN

The design program for an ecolodge at Flamingo considers: findings from precedent studies, interviews, on-site observation, and site analysis, as well as requirements in Flamingo's RFEI document, Mehta's Authentic Ecolodge Criteria, and sustainable SITES® design principles. The design goal is to conceptualize how ecolodge development can be adapted in a U.S. national park. This design communicates how specific ecolodge criteria are achieved, SITES® standards are met, and what the overall ecolodge guest experience is like. The specific ecolodge design program elements are:

- Main Lodge
Main floor: to provide interpretation exhibit, gift shop, guest check-in, and dining. Second floor: to provide seven guest rooms.
- Event Space
For indoor meetings and educational presentations.
- Flamingo Bay Dock
For outdoor events and nature-guided tours.
- Eco-Bungalows
An eco-friendly experience, includes drive-in units.
- Limited Parking and Hardscape
To reduce heat island effect and stormwater run-off.
- Elevated Boardwalk
To reduce disruption to native vegetation.
- Preserved Natural Areas

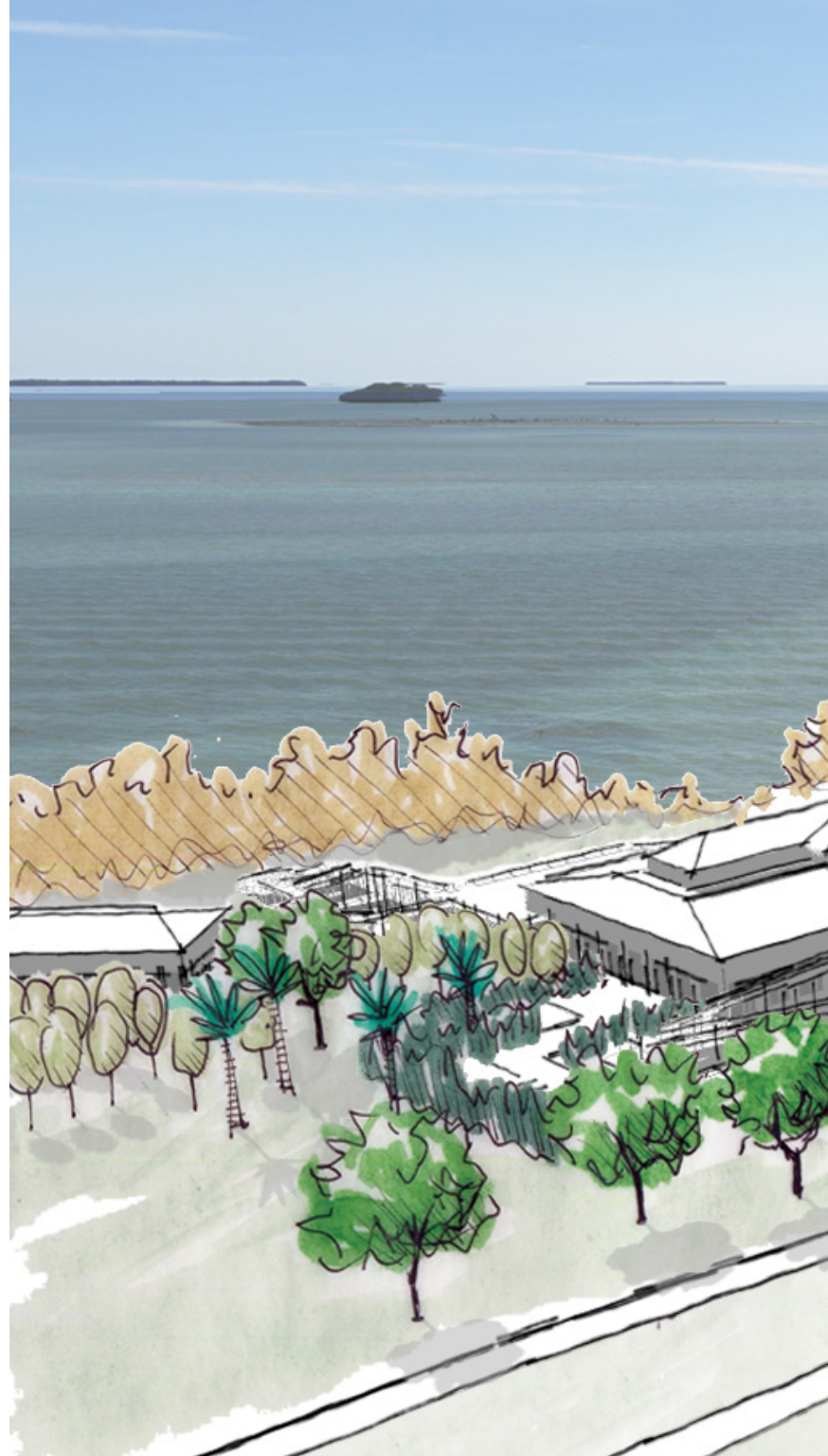




FIGURE 5.1: Ecolodge Design Overview (Steward, 2017)

DESIGN PROGRAM: CONSIDERATIONS & REQUIREMENTS

As stated on the previous page, the design program for an ecolodge at Flamingo considers requirements from: Flamingo's RFEI document, Mehta's Authentic Ecolodge Criteria, and sustainable site design principles from SITES®, in addition to findings from this project's research methods. It is crucial to understand these requirements, guidelines, and evaluation systems (listed to the right) when developing an ecolodge program. It is also important to continuously reflect back to these considerations during design in order for the ecolodge's final design to be both authentic and sustainable.

NPS PROGRAM TO BE MET IN THIS PROJECT

ECOLOGDE CRITERIA TO BE MET IN THIS PROJECT

ADDITIONAL SUSTAINABLE CONSIDERATIONS

FLAMINGO RFEI REQUIREMENTS

The following requirements were made by the Everglades National Park and stated in the Request for Expressions of Interest (RFEI) document released in 2016. The intent is for a new concessioner to takeover existing services and lodge construction at the Flamingo District. The requirements extracted below are relevant only to the design and use of Flamingo's Lodge, and Restaurant.

1. 24 guest rooms or units must be constructed:
 - 4 studio units (300 sqft minimum)
 - 12 one-bedroom units (450 sqft minimum)
 - 8 two-bedroom units (600 sqft minimum)
2. All units must include: deck, kitchenette, bathroom, and dining area.
3. Must be connected to water, wastewater, and electricity
4. All buildings must be on 10-12ft pilings and Finished Floor Elevation at 16ft above sea level.
5. Restaurant must be located on the lodge site.
6. Restaurant, Lodge Check-in, and Retail are all to be bundled into one common lodge building.
7. Lodge building at a minimum of 4,000sq ft.

AUTHENTIC ECOLOGUE CRITERIA

In addition to satisfying the three components of ecotourism, at least two of the following criteria must be met to be considered an authentic ecolodge as defined by ecolodge expert Hitesh Mehta:

1. Use alternative and sustainable means of water acquisition and at the same time reduce overall water consumption.
2. Meet its energy needs through passive design and renewable sources.
3. Provide for careful handling (reduce, refuse, recycle, reuse) and disposal of solid waste.
4. Use environmentally friendly sewage treatment systems.
5. Fit into its specific physical and cultural contexts through careful attention to form, landscaping, and color as well as through the use of vernacular architecture.
6. Use environmentally friendly building and furnishings materials.
7. Have minimal impact on the natural surroundings and utilize traditional building techniques during construction.
8. Endeavor to work with the local community, including community members, wherever possible, in the initial physical planning and design stages of construction (Mehta, 2010, 11).

SUSTAINABLE SITES® PRINCIPLES

The following principles underlie the Sustainable SITES Initiative and were developed in partnership between the American Society of Landscape Architects, the Lady Bird Johnson Wildflower Center, and United States Botanic Garden.

1. Do no harm
2. Apply the precautionary principle
3. Design with nature and culture
4. Use a decision-making hierarchy of preservation, conservation, and regeneration
5. Provide regenerative systems as intergenerational equity
6. Support a living process
7. Use a systems thinking approach
8. Use a collaborative and ethical approach
9. Maintain integrity in leadership and research
10. Foster environmental stewardship

PROJECT SITE PLAN

- A Restaurant/Lodge/Gift Shop
- B Outdoor Dining
- C Event Space
- D Guest Parking
- E Drop-Off
- F Restaurant Parking
- G Service Area
- H Drive In Bungalows
- I Crocodile Eco-Bungalow Cluster
- J Spoonbill Eco-Bungalow Cluster
- K Manatee Eco-Bungalow Cluster
- L Elevated Boardwalk
- M Flamingo Bay Dock
- N Existing Left Station
- O Guy Bradley Trail

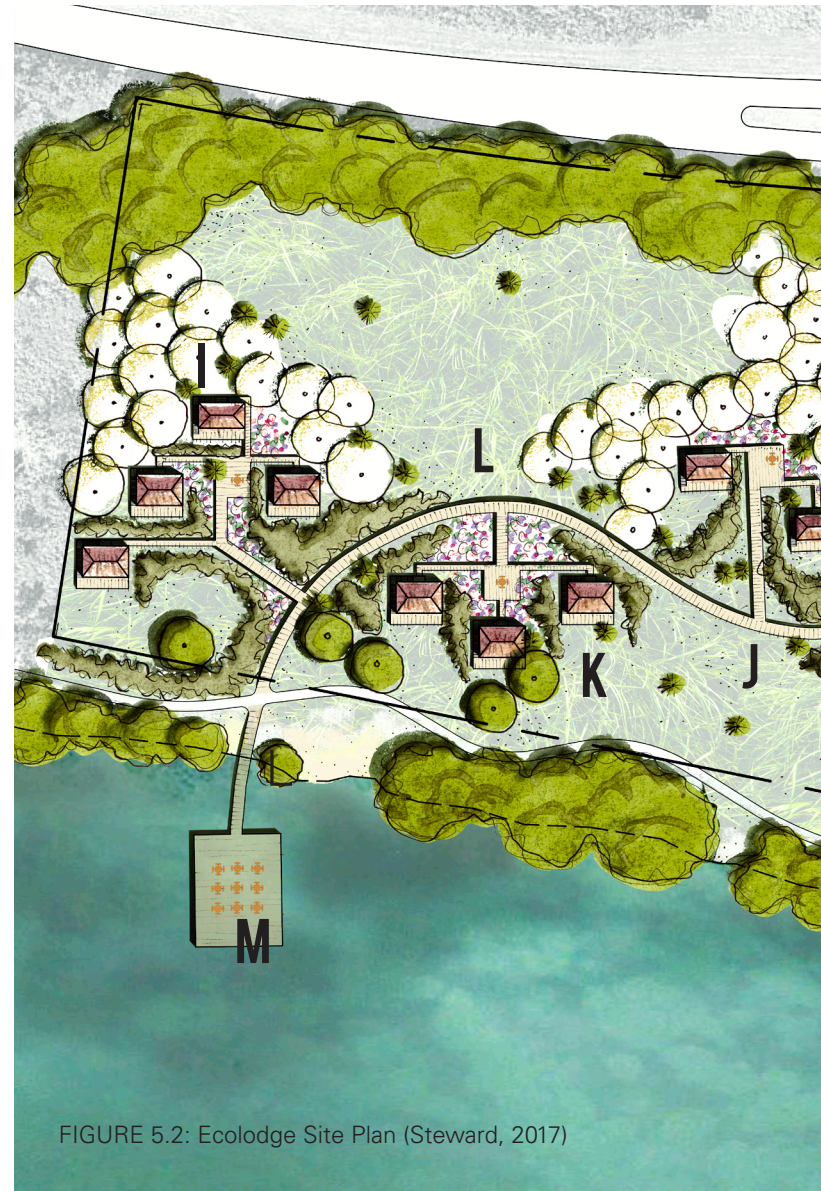
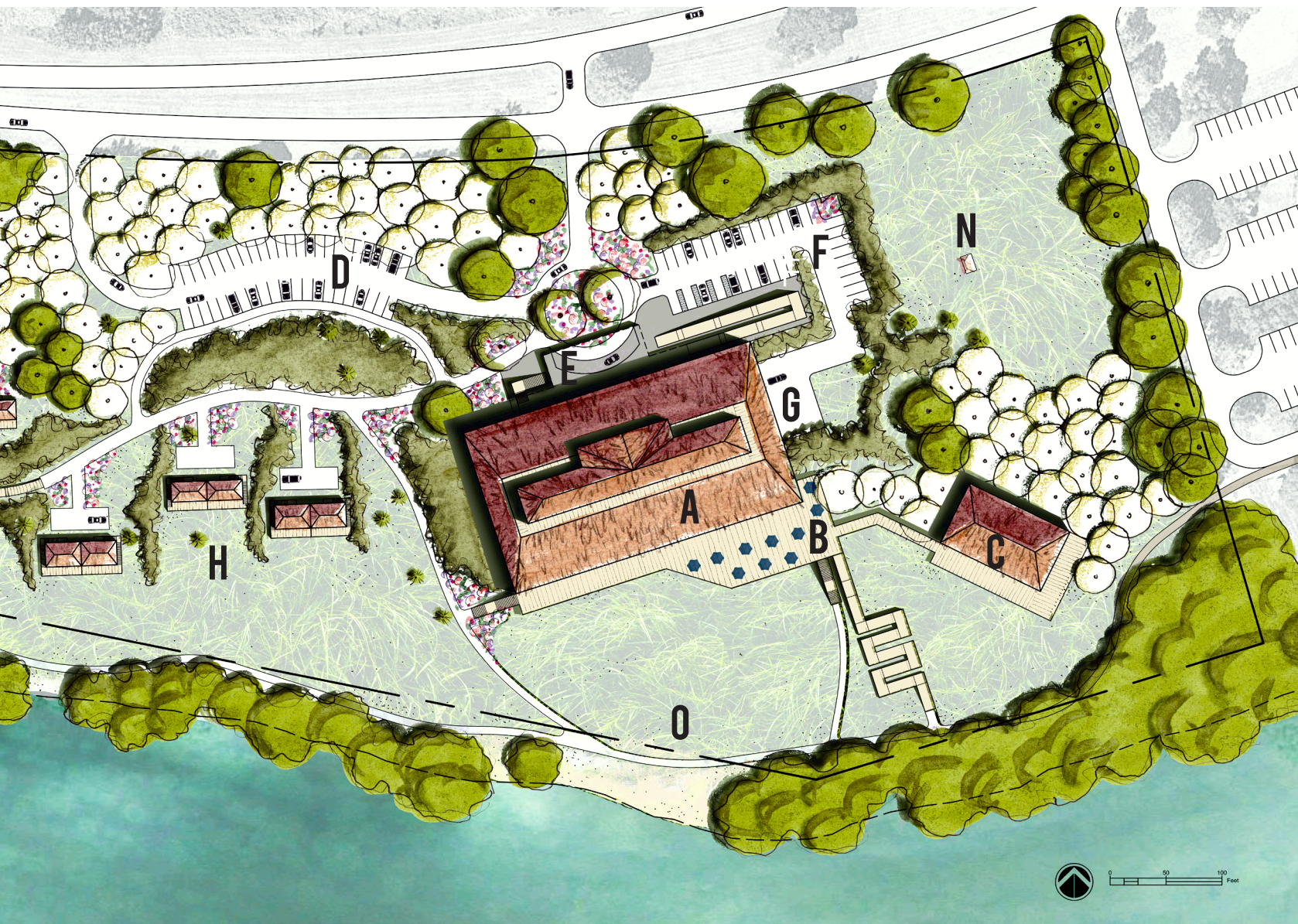


FIGURE 5.2: Ecolodge Site Plan (Steward, 2017)



APPLYING ECOLOGDE CRITERIA

To prove the validity of this ecolodge project, Mehta's Authentic Ecolodge Criteria has been used in design development. Ecolodge icons (shown on this page) will be used throughout the design section to indicate a strategy or idea addressing each criteria. According to Mehta, all ecolodges must embody the three main principles of ecotourism:

- Nature must be protected and conserved
- Community outreach and education programs must benefit the local community
- Provide interpretive programs must be offered to educate both tourists and employees about the surrounding natural and cultural environments



If these three principles are satisfied, then an ecolodge must also satisfy at least 2 of the 8 criteria (listed on page 105) to be considered authentic. Four out of eight criteria are satisfied in this ecolodge design for Flamingo.

SELECT AUTHENTIC ECOLOGDE CRITERIA

2. Meet energy needs through passive design and renewable sources.



The lodge, pavilion, and bungalows all feature large screened windows on all walls for cross ventilation to maximize cool breeze airflow in the mornings and evenings. Solar technology is used to heat water for sinks and bungalow showers.

4. Use environmentally friendly sewage treatment systems.



Rest rooms in the main lodge building will use low-flow high-efficiency toilets and sinks. Bungalows will use low flow sinks and shower heads. Bungalows will also use composting toilets where liquid and solid waste are stored separately and regularly collected by workers to be diluted and used as fertilizer for plants on site. (C-Head Composting Toilets)

SELECT AUTHENTIC ECOLODGE CRITERIA

5. Fit into its specific physical and cultural contexts through careful attention to form, landscaping, and color as well as through the use of vernacular architecture.

This lodge design attempts to connect back to the long forgotten vernacular architecture of the Calusa tribe. This lodge design fits to the specific physical landscape context by using only native plants, but through multiple planting strategies create different guest experiences.

7. Have minimal impact on the natural surroundings and utilize traditional building techniques during construction.

Landscape hardscape, -roads, parking, concrete paths, and paved plazas—is kept to the very minimum at Flamingo to have minimal impact on the site. Dense areas of existing vegetation are all preserved, and only nine existing trees will need to be transplanted during construction.



ECOLODGE DESIGN ICONS KEY

conserve nature



benefit local community



provide interpretation



fit to context of place



minimal environ. impact



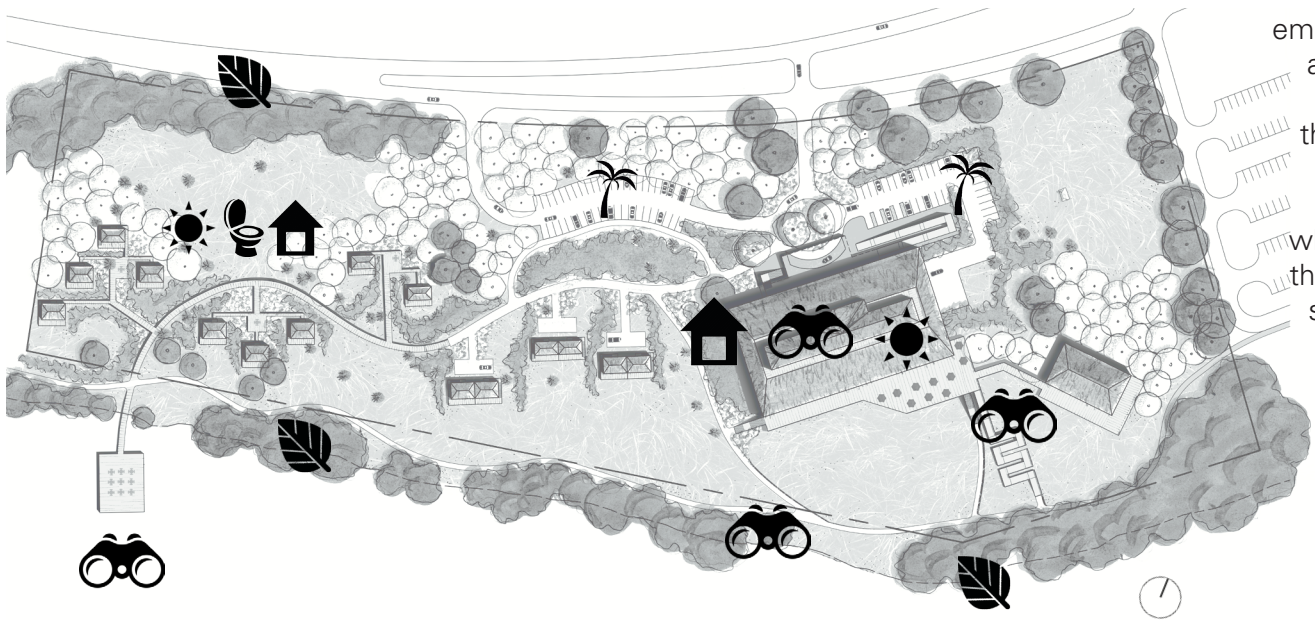
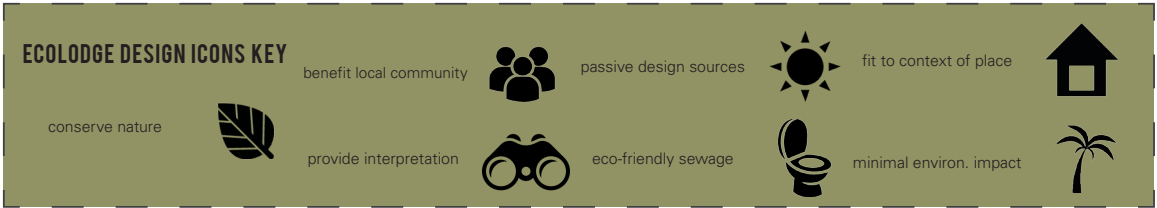
passive design sources



eco-friendly sewage



ECOLOGDE COMPONENTS OF THE SITE



The Local Community component does not translate to a certain element of the site plan. The Flamingo District generates seasonal jobs and full time employment for locals and provides onsite living. In addition, the revenue created by the Everglades National Park as a whole greatly boosts the economy of local south Florida cities; Homestead and Florida City (Showler, 2017).

FIGURE 5.3: Ecologde Site Components (Steward, 2017)

MAIN DESIGN MOVES

Create a Central Pedestrian Spine

Create Intimate Group Experiences

Capitalize on Florida Bay Views

Minimize Vehicular Footprint









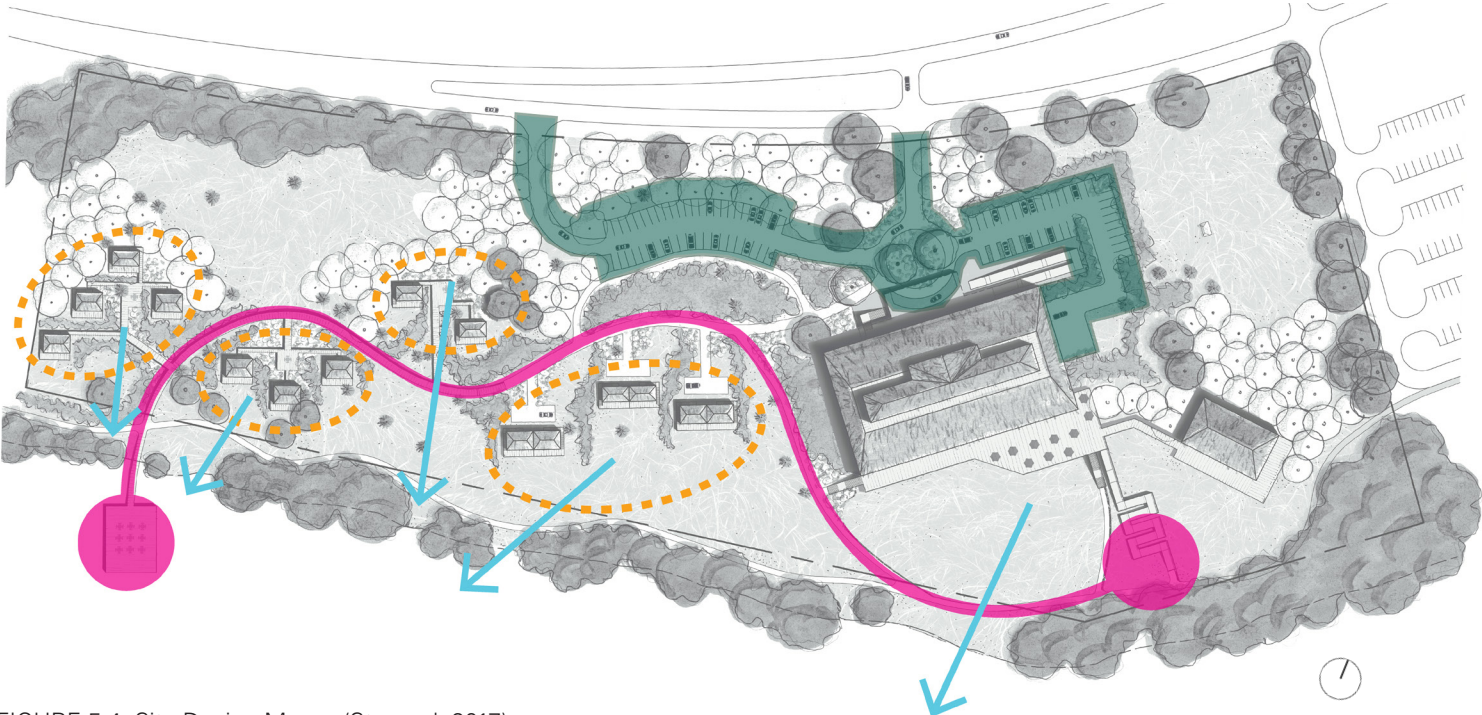


FIGURE 5.4: Site Design Moves (Steward, 2017)

DESIGN

111

PLANTING DESIGN



The focus of the plant palette created for Flamingo is on *Wind Tolerance* and *Native Species*. All plants included in this palette are native to south Florida, and all plants selected are highly to moderately wind tolerant as well as salt tolerant. The reason for selecting only highly wind resistant native plants is to create an arrangement of vegetation throughout the lodge site that:

1. Lends a natural appearance
2. Harmonizes with surrounding ecosystems
3. Withstands moderate storm or hurricane conditions
4. Is as safe as possible for on-site guests and staff during a storm event.

WIND TOLERANT VEGETATION

Hurricanes are highly unpredictable and are known to cause great devastation to anything and everything in their path. Few environments (designed by man, or natural) can withstand a Category 4 Hurricane (131-155mph winds) or Category 5 Hurricane (156+ mph winds). Likewise, environments that are flooded from a hurricane or in the direct path of the eye of a hurricane (no matter the category) will experience severe loss. However, Pamela Crawford claims in her

book, *Stormscaping*, that hurricane vegetation damage in the land path of a hurricane's eye is relatively narrow and Category 4 and 5 hurricanes are rare—only 10% of Florida's hurricanes in the last century.

The large majority of land area in Florida effected by hurricanes experience either Category 1-3 hurricanes or the indirect high winds and heavy rainfall of nearby tropical storms. For this land area, most damage by lower category storms and high winds is to vegetation, or inflicted by falling vegetation. Florida's hurricane season of 2004 was legendary, but proves this point. In 2004, 100,000 people experienced 130+mph winds and suffered great damage to their yards, homes and businesses. However, 7,000,000 people in Florida experienced winds from 70-95mph and suffered damage to vegetation (Crawford, 2005). Many trees and plants are tolerant of 70-95mph winds, but unfortunately many of the 7,000,000 people in 2004 experienced damage from (low wind tolerant) trees toppling onto their cars, homes, and power lines. This kind of damage to infrastructure can be greatly reduced by selective plant palettes and smart planting design. Knowledge of storm patterns and the level of a plant's wind tolerance, can greatly reduce future hurricane storm damage at Flamingo.

FLAMINGO'S PLANT PALETTE

This plant palette (listed on the pages 116-119) breaks down vegetation types for the final design of a sustainable ecolodge site for Flamingo into 6 categories: Shade Trees, Palm Trees, Shrubs, Flowering Plants, and Groundcovers & Vines. Each plant's scientific name, wind tolerance level, height, native plant indication, and salt tolerance are noted.

COASTAL PRAIRIE

This vegetation type attempts to restore degraded ecosystems.



FIGURE 5.5: Coastal Prairie (Dubols, 2011)

SHOWCASE PLANTINGS

Showcase plantings accentuate entries, pathways, and gathering spaces.



FIGURE 5.7: Showcase Plantings (Felix, 2012)

By using this palette and mixing species from different categories, plants will be used to serve four different functions in the sustainable ecolodge landscape design for Flamingo:

Coastal Prairie | *Screen* | *Showcase* | *Forest Habitat*

SCREEN PLANTINGS

Screen vegetation creates privacy walls and needed visual barriers.



FIGURE 5.6: Forest Path (Owens, 2013)

FOREST HABITAT

This vegetation type attempts to regenerate lost forest ecosystems.



FIGURE 5.8: Hardwood Hammock (Alan, 2015)

PLANTING PLAN



The coastal mangrove edges of the site will be preserved along with all possible existing mature trees on site—mainly native shade trees and palm trees from the previous lodge site. Only 9 trees will need to be transplanted during construction. In addition to existing vegetation, new native, salt tolerant, and wind tolerant plant material will be introduced. These new plantings will be used to serve four different functions in the sustainable ecolodge landscape design for Flamingo as shown in FIGURE 5.9:

Coastal Prairie | Screen | Showcase | Forest Habitat

Conserving nearly all existing vegetation and introducing only native vegetation that is durable enough for Flamingo's extreme tropical storm events is a way to meet one of the three necessary ecolodge components:

"Nature must be protected and conserved."

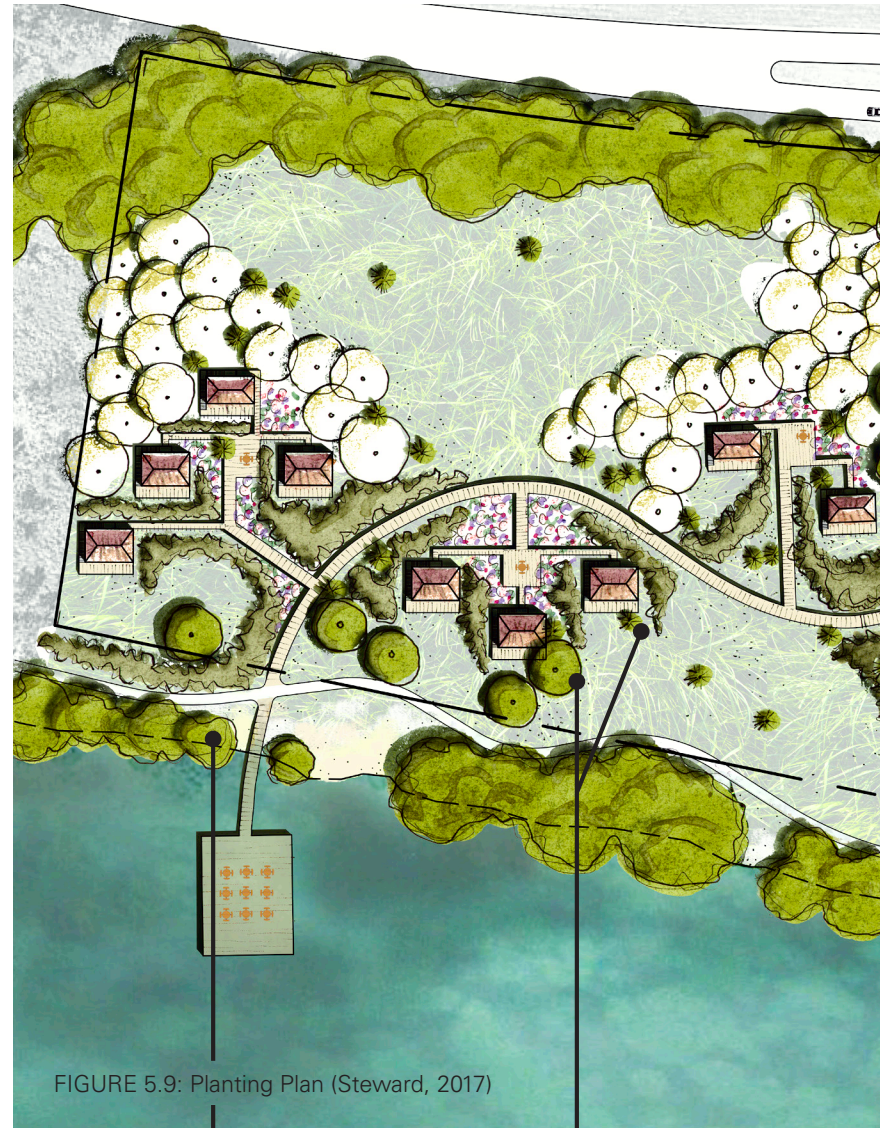
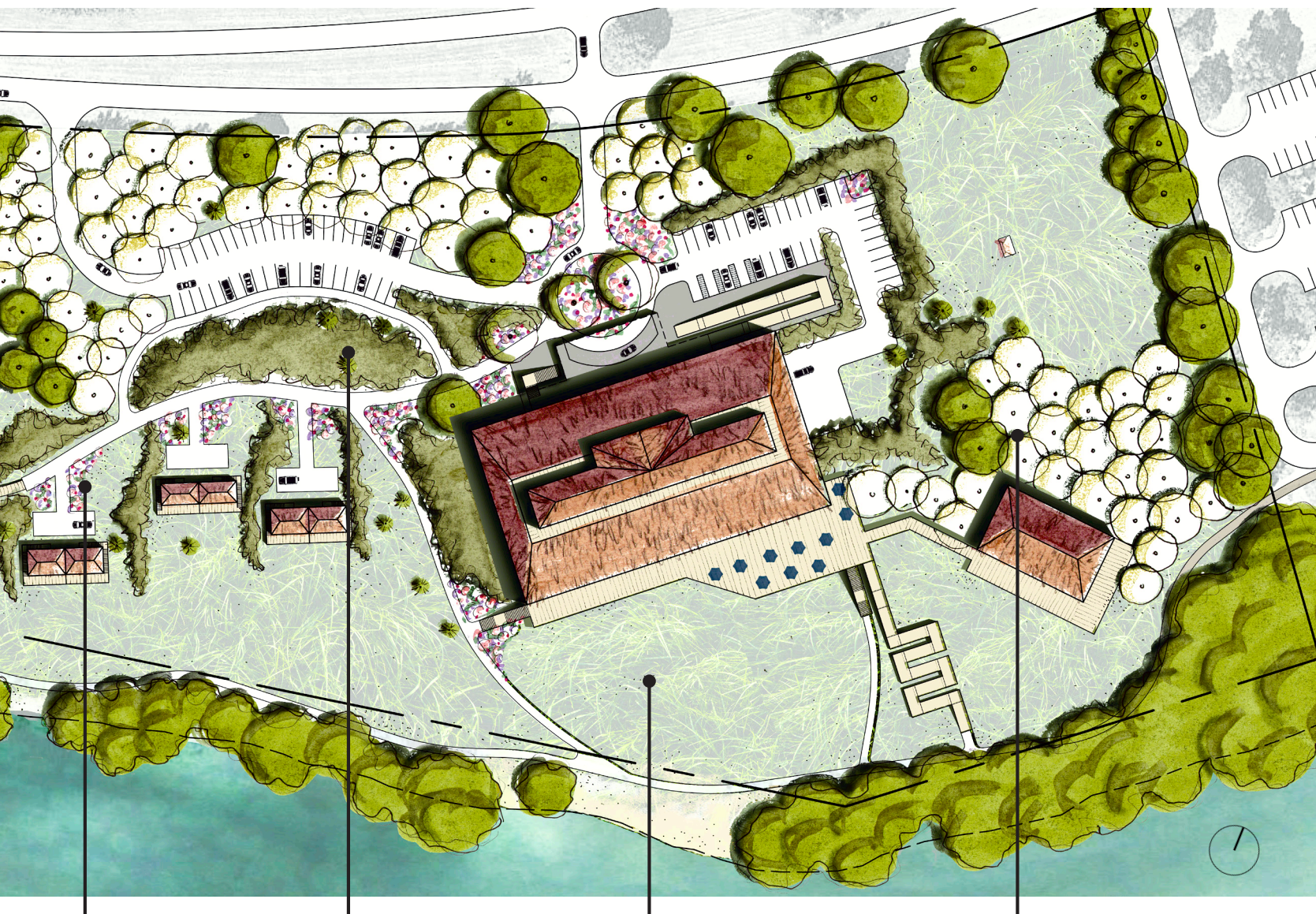


FIGURE 5.9: Planting Plan (Steward, 2017)

Existing
Mangroves

Existing
Shade/Palm Trees



Showcase
Plantings

Screen
Plantings

Coastal Prairie
Plantings

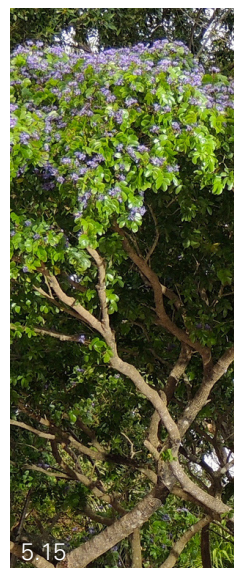
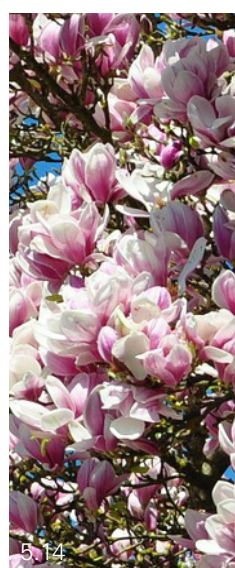
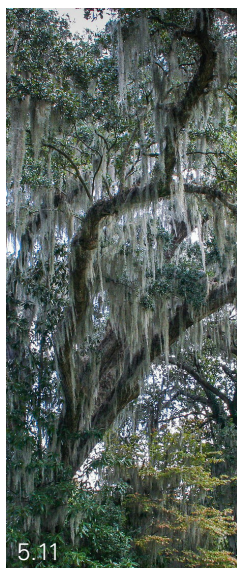
Forest Habitat
Plantings

PLANT PALETTE



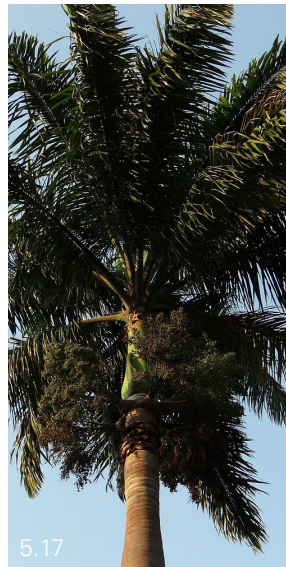
SHADE TREES

Common Name	Scientific Name	Wind Tolerance	Height	Native?	Salt Tolerance
Gumbo Limbo	<i>Bursera simaruba</i>	High	25-30ft	Yes	High
Live Oak	<i>Quercus virginiana</i>	Very High	40ft+	Yes	High
Bald Cypress	<i>Taxodium distichum</i>	High	40ft+	Yes	High
Ironwood	<i>Krugiodendron ferreum</i>	Very High	20ft	Yes	Moderate
Southern Magnolia	<i>Magnolia grandiflora</i>	Very High	50ft+	Yes	High
Ligum Vitae	<i>Guaiacum sanctum</i>	High	30ft	Yes	High



PALMS

Common Name	Scientific Name	Wind Tolerance	Height	Native?	Salt Tolerance
Sabel (Cabbage) Palm	<i>Sabal palmetto</i>	Very High	30ft	Yes	High
Royal Palm	<i>Roystonea regia</i>	High	60ft	Yes	Moderate
Thatch Palm	<i>Thrinax radiata</i>	High	20ft	Yes	High
Silver Palm	<i>Coccothrinax argentata</i>	High	5-15ft	Yes	High
Buccaneer Palm	<i>Pseudophoenix sargentii</i>	High	15ft	Yes	High

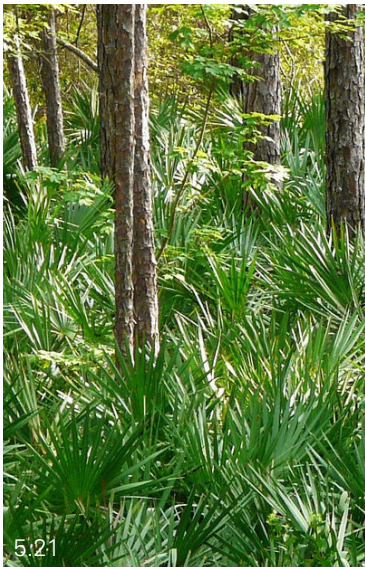


PLANT PALETTE



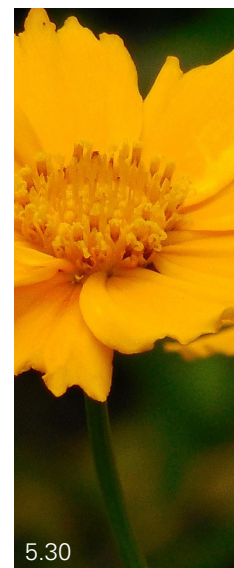
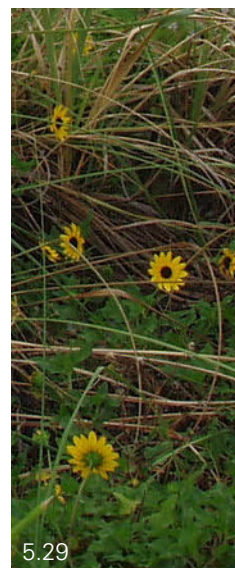
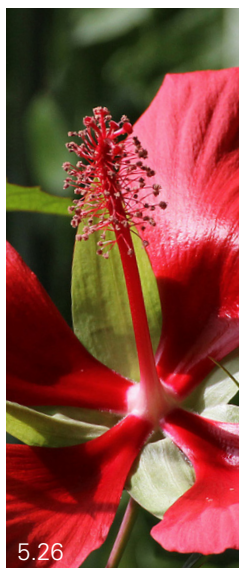
SHRUBS & SCREENS

Common Name	Scientific Name	Wind Tolerance	Height	Native?	Salt Tolerance
Saw Palmetto Palm	<i>Serenoa repens</i>	Very High	3-6ft	Yes	High
Coontie	<i>Zamia floridana</i>	High	2-5ft	Yes	High
Sea Grape	<i>Coccoloba uvifera</i>	High	3-30ft	Yes	High
Beautyberry	<i>Callicarpa americana</i>	High	3-7ft	Yes	High



FLOWERING PLANTS

Common Name	Scientific Name	Wind Tolerance	Height	Native?	Salt Tolerance
Ixora	<i>Ixora spp</i>	High	3-6ft	Yes	Moderate
Marsh Hibiscus	<i>Hibiscus coccineus</i>	High	4-8ft	Yes	High
Gaillardia	<i>Gaillardia pulchella</i>	High	1-2ft	Yes	High
Blue Porterweed	<i>Stachytarphata urticifolia</i>	High	1-3ft	Yes	High
Beach Sunflower	<i>Helianthus debilis</i>	High	1-2ft	Yes	High
Tickseed	<i>Coreopsis leavenworthii</i>	High	1.5-3ft	Yes	High

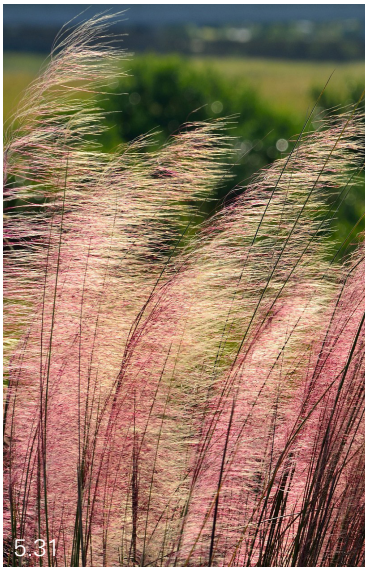


PLANT PALETTE



GRASSES

Common Name	Scientific Name	Wind Tolerance	Height	Native?	Salt Tolerance
Gumbo Limbo	<i>Bursera simaruba</i>	High	25-30ft	Yes	High
Live Oak	<i>Quercus virginiana</i>	Very High	40ft+	Yes	High
Bald Cypress	<i>Taxodium distichum</i>	High	40ft+	Yes	High
Ironwood	<i>Krugiodendron ferreum</i>	Very High	20ft	Yes	Moderate
Southern Magnolia	<i>Magnolia grandiflora</i>	Very High	50ft+	Yes	High
Ligum Vitae	<i>Guaiaacum sanctum</i>	High	30ft	Yes	High



GROUNDCOVERS & VINES

Common Name	Scientific Name	Wind Tolerance	Height	Native?	Salt Tolerance
Florida Plumbago	<i>Plumbago scandens</i>	High	1ft	Yes	Moderate
Coral Honeysuckle	<i>Lonicera sempervirens</i>	High	Climber	Yes	Moderate
Inkberry	<i>Scaevola plumieri</i>	High	2ft	Yes	High



ARCHITECTURAL STYLE



Although this book is written from the landscape architecture point of view, it would be impossible to create an ecolodge site design without imagining or conceptually designing the architecture, or structures on site. The first step in this process is to decide what the architectural style should be for an ecolodge at Flamingo. From Mehta's authentic ecolodge criteria, 2 of the 8 relate to the style of an ecolodge building:

1. *[The ecolodge should] fit into its specific physical and cultural contexts through careful attention to form, landscaping, and color as well as through the use of vernacular architecture.*
2. *Have minimal impact on the natural surroundings and utilize traditional building techniques during construction.*

This begs the questions: What is the vernacular architecture for Flamingo and the Everglades—a place virtually void of development or local people? What are traditional building techniques for this region? These questions began the investigation on who lived in the Everglades before it was a National Park. If native people once lived here, how did they live and what did their developments look like?

THE CALUSA PEOPLE

Although the Seminole and Miccosukee Native American tribes are associated with the Everglades today, this was not their original homeland. These two tribes originally lived in the northern part of Florida and across the present day southeastern United States, but after the Indian Removal Act of 1830, were forced southward in retreat from the American's during the first, second and third Seminole Wars (Historical Society of Palm Beach County, 2009).

However, far before these events the Calusa People or "fierce people" were the indigenous people of the Everglades and lived in great numbers across the greater area of South Florida. The Spanish first encountered the Calusa in the 1500s and found their society to be socially and religiously complex, and very powerful politically (South Florida Archaeology and Ethnography, 2017). The religious traditions of the tribe were elaborate. Through historical Spanish accounts this included masks, synchronized singing, massive worship structures that could hold over 2,000 people. The Calusa king was viewed as God, and had power to grant life or death to all his people (South Florida Archaeology and Ethnography, 2017).

Because of the environment of the South Florida, these people had no staple crops, but instead relied on fishing for their primary food source. These people constructed canoes of pine wood, and engineered miles and miles of canal systems for fishing. All the shells from fishing activities were saved and used to build mounds on which the Calusa's most sacred structures sat, and used to make tools and jewelry. Artist Merald Clark created a rendering of what these large religious structures could have looked like in FIGURE 5.38. Today, remains of some of the Calusa's original shell mounds can be found across South Florida and look like the shell mound in FIGURE 5.39. The most likely spot to see these mounds is along the Calusa Heritage Trail and archaeological site at Pine Island on Florida's southwest coast.



FIGURE 5.39: Shell Mound. (Creative Commons Image, 2014)



FIGURE 5.38: Calusa King's House in 1566.
(Florida Museum of Natural History by Artist Merald Clark, 2017)

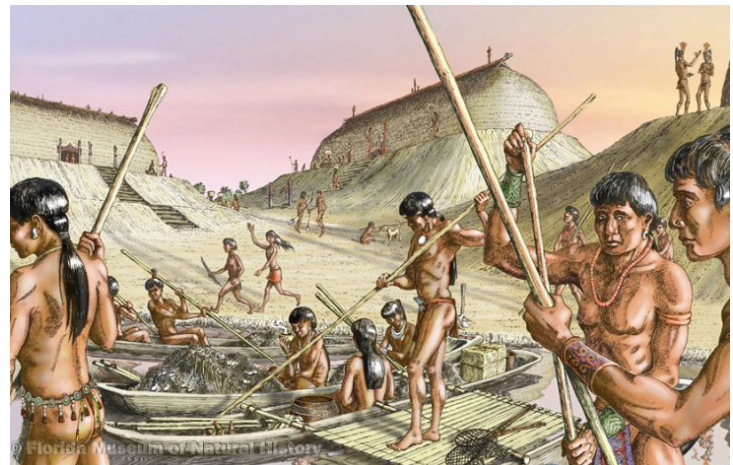


FIGURE 5.40: Calusa People Preparing for Fishing in the Estuary.
(Florida Museum of Natural History by Artist Merald Clark, 2017)

ARCHITECTURAL STYLE



THE CALUSA PEOPLE

The Calusa were attuned to Florida's seasons and cycles. In response to the climate, the Calusa's architecture was all raised high above sea level. For important buildings—religious structures and homes of nobility—massive shell mounds were constructed. For the homes of the common people more simple timber structures were built up on stilts and typically without walls. These two building types can be seen in FIGURE 5.41, a rendering of what a major Calusa village could

have looked like by architect and city planner Richard Thornton. All structures were believed to be topped with thatch or palmetto leaves as roofs. Depending on location, either entire villages were supported by deep pilings, or when higher ground could be found cement-like foundations were constructed by mixing shell and marl clay (South Florida Archaeology and Ethnography, 2017). FIGURES 5.42-45 to the right are from a display by AST Exhibits at Marco Island Historical Museum that show at the human scale what the Calusa's buildings might have looked like.



FIGURE 5.41: Kalos: Island Capital of the Calusa People. (Richard Thornton, 2014)



FIGURE 5.42: Calusa Village Exhibit (AST Exhibits, 2015)



FIGURE 5.43: Native Cypress Lumber (AST Exhibits, 2015)



FIGURE 5.44: Shell Mound Foundation (AST Exhibits, 2015)



FIGURE 5.45: Calusa Chickee Huts (AST Exhibits, 2015)

ARCHITECTURAL STYLE



DESIGN TAKE-AWAYS

The architectural style attributes that can be taken from the Calusa culture and applied and emulated through this ecolodge project are:

1. *Elevated Structures*: on pilings or large mounds
2. *"No Walls"*: structures with large windows or entire glass/screen walls
3. *Thatch Roofs*: or thatch-appearing roofing materials
4. *Shell Accents*: incorporate shells into structures and site design

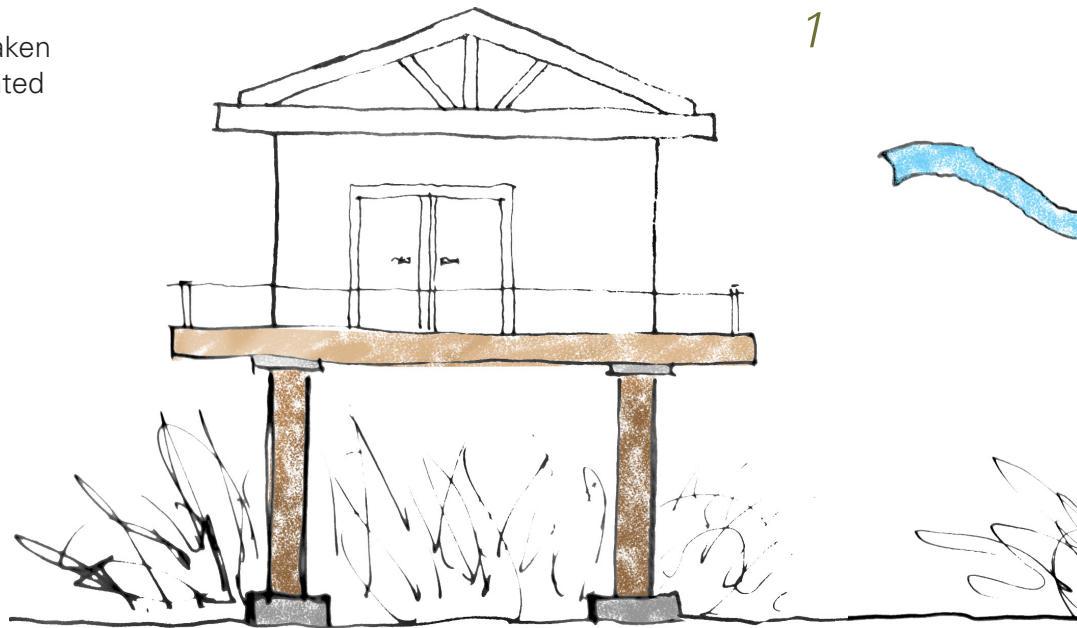
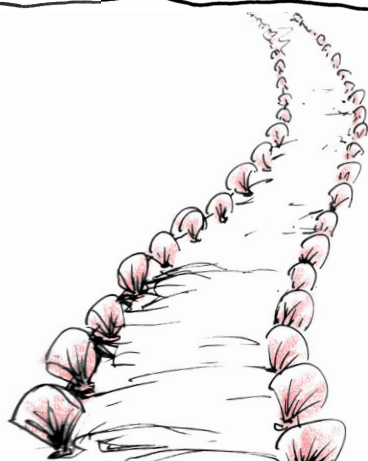
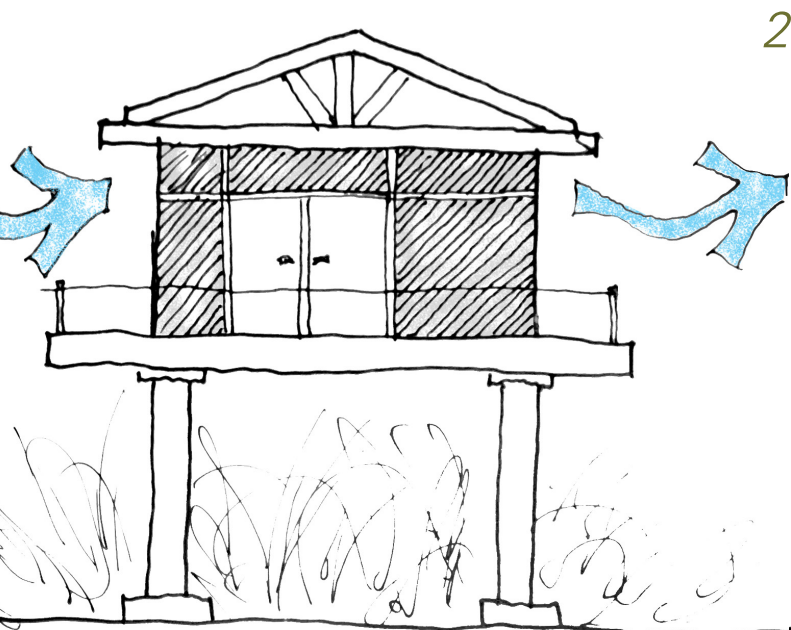


FIGURE 5.46: Calusa Design Take-Away Concepts (Steward, 2017)



EVERGLADES SAFETY CONSIDERATIONS

There are specific safety considerations for guests who will walk through and/or be staying at the Flamingo ecolodge. Alligators and crocodiles, poisonous snakes, mosquitos, and toxic vegetation are the main concerns for visitor safety on ecolodge trails or along the site's shoreline. Guests should be informed about these situations through signage and by lodge staff. However, besides the constant presence of mosquitos in the Everglades, guests should be assured it is very unlikely to encounter these types of situations during their stay.

ALLIGATORS & CROCODILES

Unlike the rest of Florida, in Flamingo it is much more common to see crocodiles than alligators. This is because most water in the Flamingo district is either brackish water (which crocodiles prefer), salt water, but not fresh water (which alligators prefer). In the unlikely event that a crocodile would be laying along a path, parking lot, or the beach, guests should keep a 30 foot diameter distance. If this space allows, guests can pass the crocodile by circling around the animal's tail end. Crocodiles and alligators are most active during dawn and dusk and during the spring season (Florida Trail Association, 2015).

POISONOUS SNAKES

There are four poisonous snake species in Florida: cottonmouth, rattlesnake, southern copperhead, and eastern coral snake. It is unlikely to come across a snake on a cleared path, so visitors should take caution when walking under low branches or venturing off into flowerbeds or beach dunes (Mitch, 2016).

POISONOUS VEGETATION

Poison ivy and poison oak both exist in the Everglades, typically growing in shady areas where there is other vegetation for the plant to climb up (Florida Hikes, 2015). These plants are easy to avoid if visitors stay on maintained paths and trails. In addition to these plants are two much more poisonous native trees: Manchineel and Poisonwood. The sap from these trees' trunks and the resin on their leaves can cause severe reactions, or temporary blindness. Trees should be avoided, especially in a rain event as the rainwater combines with the poisonous resin and falls on those underneath (Friend, 2015). During construction, the site should be surveyed by an arborist for these trees and removed.

MOSQUITOS

Mosquitos, although much thicker during the warm summer months, have a constant presence at Flamingo. Visitors should wear protective clothing—lightweight long-sleeved shirt and pants—and bug repellent when outside (Florida Trail Association 2015).

WHAT GUESTS CAN DO

- Stay on trails and paths always
- Do not pick wildflowers or touch native plants or trees
- Be alert for alligators during dawn/dusk and during the spring season
- Notify park or lodge staff if an alligator or crocodile is spotted
- Do not come closer than 30ft away from crocodiles or alligators and only pass behind the tail end of the animal
- Never feed alligators or crocodiles or attempt to move them off the trail
- Walking or talking loudly on the trail will typically scare crocodiles, alligators, and poisonous snakes off the path
- Wear protective clothing, and apply bug repellent regularly to avoid mosquito bites



FIGURE 5.47: Manchineel Tree (Barry, 2012)



FIGURE 5.48: American Crocodile (Gallagher, 2017)

INTERPRETATION OPPORTUNITIES

Interpretation is an essential component in the success and overall mission of both ecolodge development and national parks.

“Interpretation is a mission-based communication process that forges emotional and intellectual connections between the interests of the audience and the meanings inherent in the resource” (National Association for Interpretation, 2009, 2).

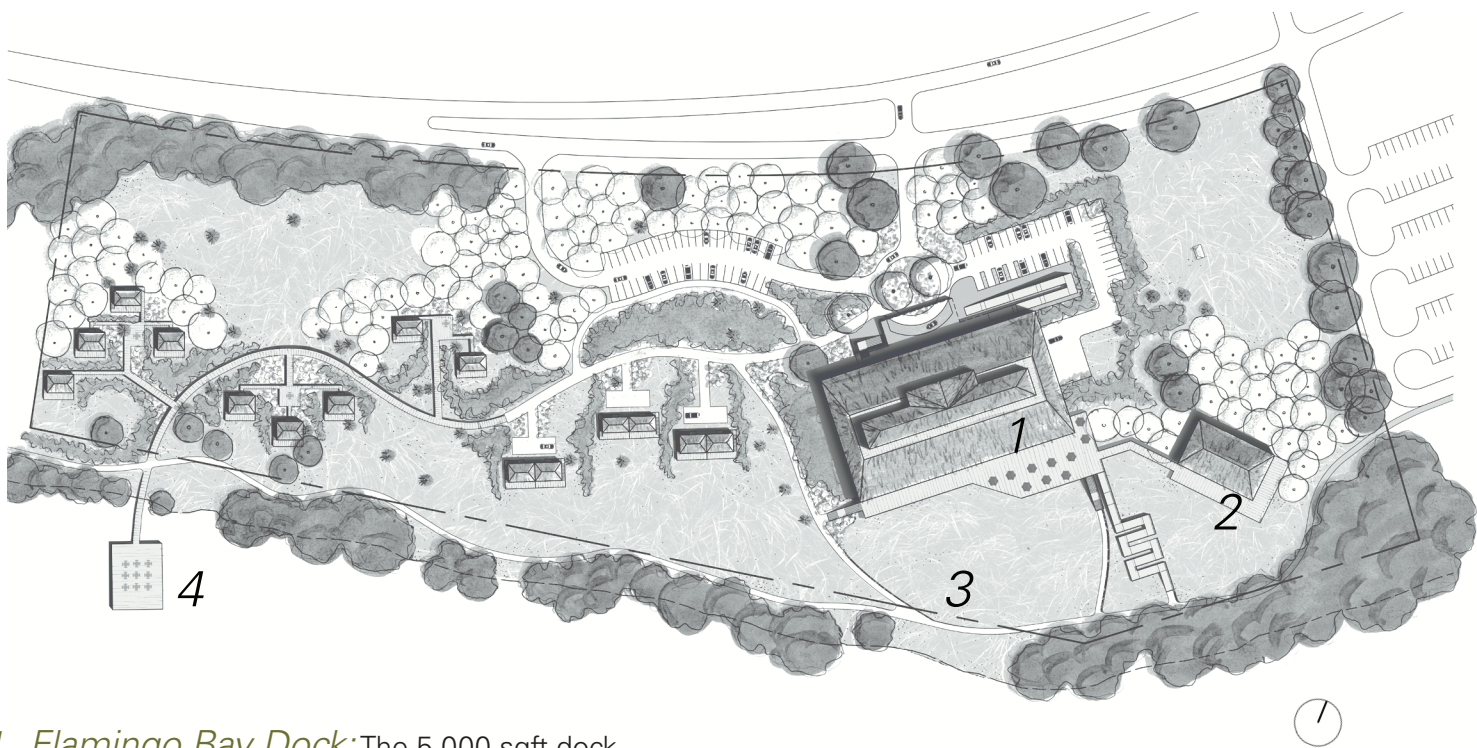
In other words, interpretation is the link of understanding between tourists and the cultural and natural resources which they are observing or visiting. Interpretation experiences can range from information on signs or websites, to live presentations or tours.

Interpretive signage, permanent and temporary exhibits, designated space for educational presentations, and routes for guided nature tours are all necessary pieces to this design program. The specific cultural and natural resources that must be shared with guests are the historical context and significance of the Calusa culture in the Everglades, the safety considerations for lodge guests regarding vegetation and wildlife, and the unique biodiversity in the Everglades and its environmental value as an

ecosystem.

The following elements of Flamingo’s ecolodge site plan will be specifically used to provide natural and cultural interpretation to guests:

1. *Indoor Calusa Exhibit:* This permanent exhibit will be located just inside the main lodge building on the main floor adjacent to the gift shop.
2. *Elevated Event Space:* The 600sqft event space is accessible only by the main lodge’s back deck and used for both indoor and outdoor presentations, gatherings, and events. This space could host everything from nature talks by NPS rangers, to Everglades National Park historical film viewings, to small conferences led by environmental based organizations.
3. *Guy Bradley Trail:* The existing Guy Bradley Trail along the south edge of Flamingo’s ecolodge site is currently used by Flamingo visitors and can expect to see more frequent use once the new lodge is built. This trail provides the opportunity for guests to explore the natural environment—namely mangrove forest, coastal prairie, and Florida Bay—of Flamingo in a personal and unstructured manner.



4. *Flamingo Bay Dock*: The 5,000 sqft dock connected to the ecolodge's main pedestrian trail/boardwalk is meant to serve as a flexible outdoor space. On a typical day, this dock can provide a terminus for nature walks along the Guy Bradley Trail, or a launching and meeting point for guided kayak or canoe tours. In the case of a special event, with the addition of moveable furniture and/or temporary shade structures, this dock could provide the space for sunset ceremonies, star gazing, or private receptions.

FIGURE 5.49: Interpretation Opportunities (Steward, 2017)

INTERPRETATION OPPORTUNITIES



This view of the Flamingo Bay Dock shows guests engaged in a variety of interpretation experiences. This dock can be used as: a resting or observation spot for visitors hiking along the Guy Bradley Trail; a meeting place for NPS ranger-led group talks; or a launch point for guests who want to kayak or paddle board Flamingo Bay. The dock is surrounded by mangrove habitat, providing a chance for guests to catch an up-close glimpse of Flamingo's diverse wildlife.





FIGURE 5.50: View of Interpretation Dock (Steward, 2017)

ECO-BUNGALOWS



There is a total of 24 guest rooms on site: 8 two-bedroom units, and 16 one-bedroom units. Nine of the rooms are located on the top floor of the main lodge. The other fifteen rooms are considered eco-bungalows and located in clusters, six with drive-up access, along the west side of the site. Strategies used that characterize these units as an eco-bungalows rather than traditional guest rooms include:

- *Solar Water Heating Technology*
used to heat water for showers and cooking 
- *Composting Toilets*
waste stored separately and regularly collected by lodge staff and used as compost or fertilizer 
- *Emulate Calusa Architectural Style*
large screened windows and walls provide cross ventilation and an eco-friendly synthetic thatch roof product will be used for durability 
- *Storm Resilient*
The bungalows will be elevated 16ft off the ground as specified by FEMA, and structures will be made of durable block walls and hurricane-proof glass

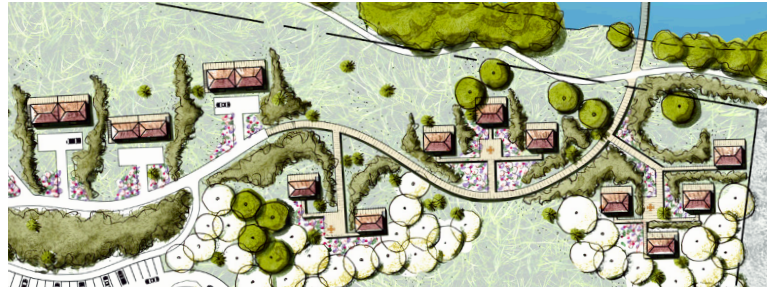


FIGURE 5.51: Eco-Bungalow Site Location (Steward, 2017)

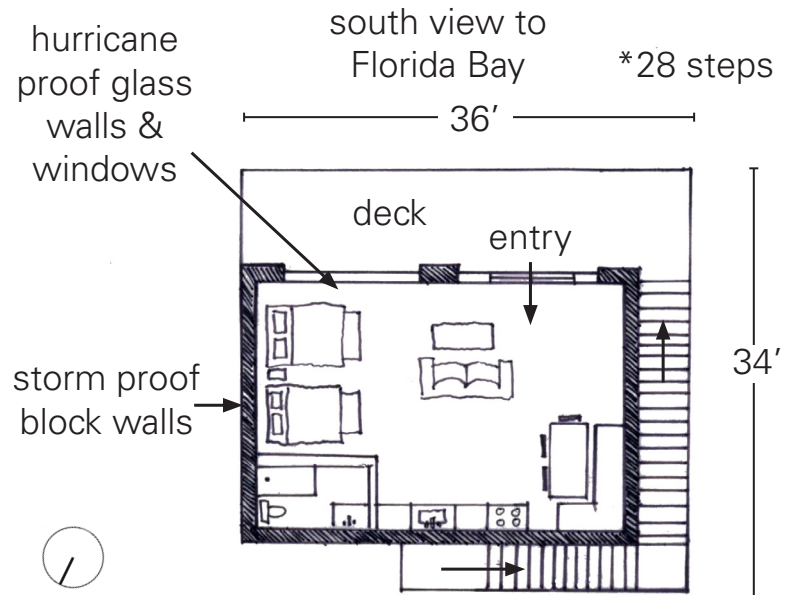


FIGURE 5.52: 2-Bed Eco-Bungalow FloorPlan (Steward, 2017)



FIGURE 5.53: Eco-Bungalow Elevation (Steward, 2017)

ECO-BUNGALOW CLUSTERS



This view of the Manatee Bungalow Cluster shows the entry experience guests might have as they walked to and from their rooms. These Eco-Bungalows are connected by elevated boardwalks which leave native soils and vegetation as undisturbed as possible, and allow for wildlife movement across the site. The entry to each bungalow cluster is planted with welcoming colorful, but native, vegetation. Screens in the form of tall palmetto palms create privacy between bungalows and frame views for guests as they stroll along the winding central boardwalk.



FIGURE 5.54: View of Manatee Bungalow Cluster (Steward, 2017)



MAIN LODGE BUILDING



As specified by the NPS in the Flamingo RFEI document, the lodge building will include a restaurant, guest check-in area, and retail gifts shop all together at the main level. In addition to the building's main floor is the second floor of nine guest rooms with superior south views to Florida Bay, and the ground level service floor (trash/recycling/compost service, goods drop-off, laundry, and storage) for staff use only accessed on the east edge of the building.

The main lodge entrance is on the north side where guests can be dropped off and take either the ramp, stairs, or elevator up to the main level. Secondary lodge entrance is accessed from the Guy Bradley Trail and draws visitors from the south up to the restaurant's back deck dining area. From this large south deck, guests can visit and use the ecolodge pavilion space for interpretive activities and meetings, or descend the stairs on the deck's west edge for direct bungalow access.

- *Storm Resilient* The lodge will be elevated 16ft off the ground on pilings as specified by FEMA, and structures will be made of durable block walls and hurricane-proof glass. Only the necessary service facilities are located at ground level, so in the even of a hurricane, minimal repairs/replacements will be needed.

- *Solar Water Heating Technology*  Some water will be heated by solar, although remaining hot water demands will be supplied from the Everglades municipal water supply (used in other Flamingo buildings). Large screened walls and windows will capitalize on cool morning/evening breezes to reduce air conditioning energy needs.

- *Water Conserving Plumbing*  Water conserving toilets, faucets, shower heads and plumbing fittings will be used to reduce water consumption

- *Calusa Architectural Style*  Large screened windows and walls provide cross ventilation and an eco-friendly synthetic thatch roof product will be used for durability. This large towering structure reflects the Calusa's raised worship structures

- *Interpretation Experiences*  Inside the lodge guests can visit an exhibit showcasing the history of the Calusa People. Also, logistics regarding daily recreation tours and interpretive talks are organized here.

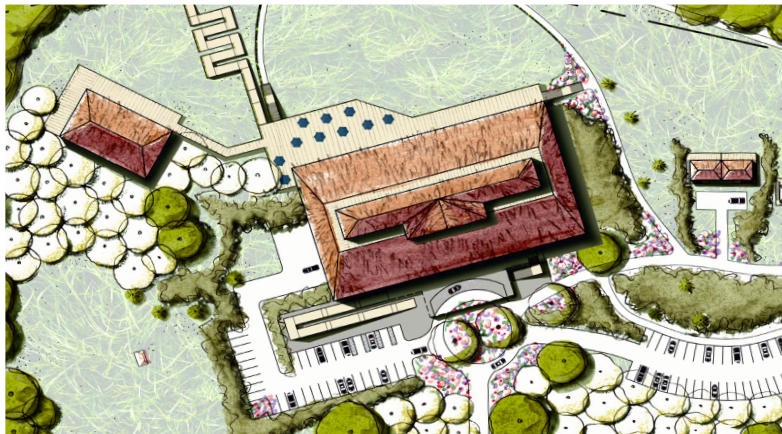
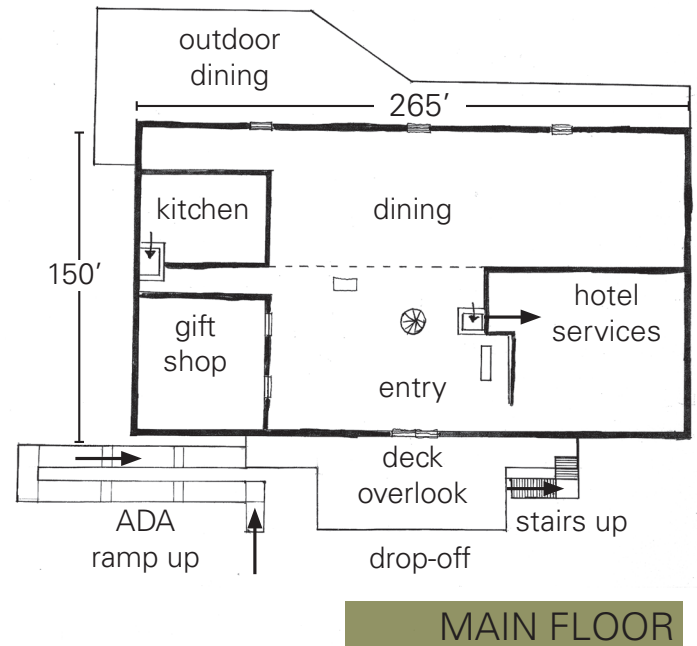
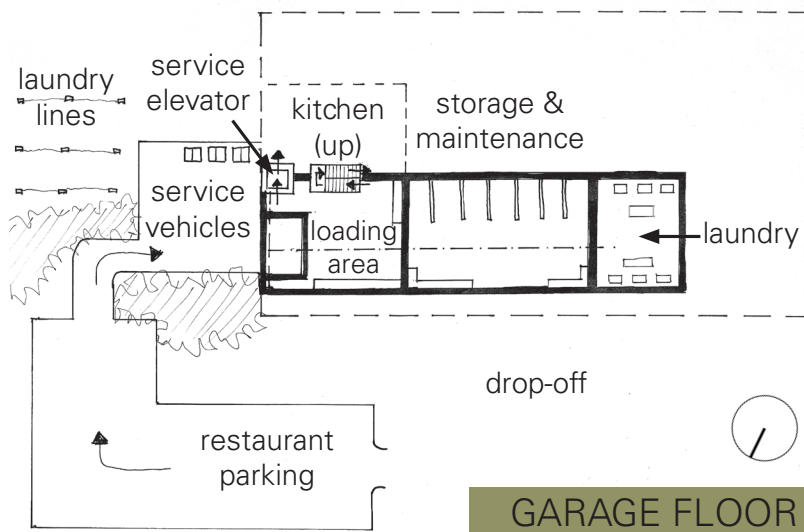


FIGURE 5.55: Main Lodge Site Location (Steward, 2017)

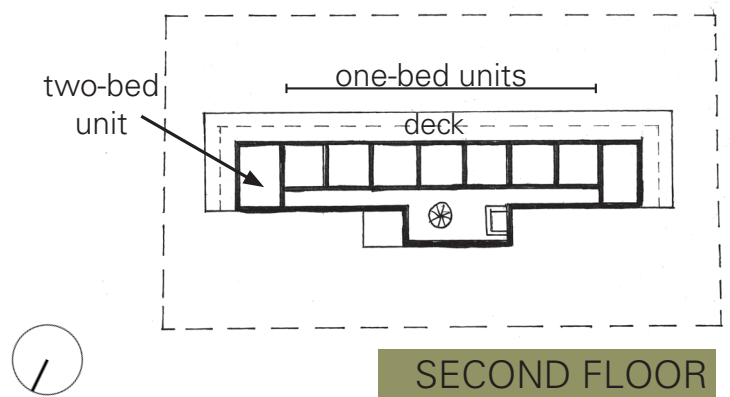


FIGURE 5.56: Main Lodge Floor Plans (Steward, 2017)

MAIN LODGE BUILDING



FIGURE 5.57: Main Lodge Elevation (Steward, 2017)



FRONT OF LODGE



This view of the Main Lodge shows what guests would see as they check in on the first day of their trip. As required by the RFEI document and FEMA, all buildings need to be elevated 16ft off the ground. New guests would pull through the covered drop off area and ascend to the main floor by stairs, ramp, or elevator. ADA, restaurant, and day parking is provided just in front of the lodge, to the northeast. Long term parking for overnight guests is provided in a small separate lot to the north west of the lodge.

On the main level, a large front viewing deck (providing a protected drop-off below) allows guests to overlook the landscape before going inside to either check in, visit the gift shop, or enjoy a meal. The second level of the lodge houses 7 guest rooms which showcase impressive views south to Florida Bay.





FIGURE 5.58: Main Lodge Front View (Steward, 2017)

BACK OF LODGE



This view is from the ecolodge event space looking towards the back of the main lodge. The ADA ramp on the south side of the lodge allows visitors from the Guy Bradley Trail to easily spot in for a meal in the ecolodge restaurant. On the lodge's back deck there is a large outdoor dining area where guests can eat while enjoying wide views out to Flamingo Bay. The event space—used for private parties, meetings, yoga or exercise classes, and seasonal events—is connected to the lodge's back dining area by an elevated deck.



FIGURE 5.59: Main Lodge Back View (Steward, 2017)



APPLYING SUSTAINABLE SITES® GUIDELINES

The central message of SITES® “is that any project holds the potential to protect, improve, and regenerate the benefits and services provided by healthy ecosystems’ (Sustainable SITES® Initiative, 2014, vi). To increase the validity and standards for sustainable site development, SITES® has formed a systematic set of guidelines and a rating system used to measure site performance and value. The score card, seen in FIGURE 5.65, evaluates the success of the Site through a point system using a combination of prerequisites and credits. The scorecard’s criteria is divided into 10 sections that are modeled after the typical design phases. Included in 7 of the 10 sections there are 18 prerequisites (shown in light blue in FIGURE 5.65) which must be met if a project is to be considered for certification. The credits are considered optional, but a minimum of a 70 points must be achieved for a project to reach the lowest level of certification.

The organization of this system is similar to Mehta’s ecolodge criteria in that there are bottom line prerequisites that must be met, and then a multitude of additional criteria which provide a variety and creativity in design response to allow for diverse project types and site contexts.

In the next few pages, the score card will be applied to this ecolodge project for Flamingo. For this project, each possible prerequisite or credit is addressed through writing and a score is given. It is important to note that section 7) Construction will largely be left up to the decision of Flamingo’s future concessioner and the contractor which they choose. Certain criteria, like those in Section 7) Construction will largely be left up to the decision of Flamingo’s future concessioner, are unable to be addressed through this research+design project. For this reason, an accurate total sum of points and an exact SITES® certification level cannot be determined.

Nevertheless, the attempt to meet all SITES® criteria possible strengthens this project’s claim as a sustainable site. By using the SITES® guidelines, this project’s value as an environmentally conscious development project can stand out among other new projects within the National Park setting.

SITES v2 Scorecard Summary

YES	?	NO			
0	0	0	1: SITE CONTEXT	Possible Points:	13
Y			CONTEXT P1.1 Limit development on farmland		
Y			CONTEXT P1.2 Protect floodplain functions		
Y			CONTEXT P1.3 Conserve aquatic ecosystems		
Y			CONTEXT P1.4 Conserve habitats for threatened and endangered species		
			CONTEXT C1.5 Redevelop degraded sites	3 to 6	
			CONTEXT C1.6 Locate projects within existing developed areas	4	
			CONTEXT C1.7 Connect to multi-modal transit networks	2 to 3	
0	0	0	2: PRE-DESIGN ASSESSMENT + PLANNING	Possible Points:	3
Y			PRE-DESIGN P2.1 Use an integrative design process		
Y			PRE-DESIGN P2.2 Conduct a pre-design site assessment		
Y			PRE-DESIGN P2.3 Designate and communicate VSPZs		
			PRE-DESIGN C2.4 Engage users and stakeholders	3	
0	0	0	3: SITE DESIGN - WATER	Possible Points:	23
Y			WATER P3.1 Manage precipitation on site		
Y			WATER P3.2 Reduce water use for landscape irrigation		
			WATER C3.3 Manage precipitation beyond baseline	4 to 6	
			WATER C3.4 Reduce outdoor water use	4 to 6	
			WATER C3.5 Design functional stormwater features as amenities	4 to 5	
			WATER C3.6 Restore aquatic ecosystems	4 to 6	
0	0	0	4: SITE DESIGN - SOIL + VEGETATION	Possible Points:	40
Y			SOIL+VEG P4.1 Create and communicate a soil management plan		
Y			SOIL+VEG P4.2 Control and manage invasive plants		
Y			SOIL+VEG P4.3 Use appropriate plants		
			SOIL+VEG C4.4 Conserve healthy soils and appropriate vegetation	4 to 6	
			SOIL+VEG C4.5 Conserve special status vegetation	4	
			SOIL+VEG C4.6 Conserve and use native plants	3 to 6	
			SOIL+VEG C4.7 Conserve and restore native plant communities	4 to 6	
			SOIL+VEG C4.8 Optimize biomass	1 to 6	
			SOIL+VEG C4.9 Reduce urban heat island effects	4	
			SOIL+VEG C4.10 Use vegetation to minimize building energy use	1 to 4	
			SOIL+VEG C4.11 Reduce the risk of catastrophic wildfire	4	
0	0	0	5: SITE DESIGN - MATERIALS SELECTION	Possible Points:	41
Y			MATERIALS P5.1 Eliminate the use of wood from threatened tree species		
			MATERIALS C5.2 Maintain on-site structures and paving	2 to 4	
			MATERIALS C5.3 Design for adaptability and disassembly	3 to 4	
			MATERIALS C5.4 Use salvaged materials and plants	3 to 4	
			MATERIALS C5.5 Use recycled content materials	3 to 4	
			MATERIALS C5.6 Use regional materials	3 to 5	
			MATERIALS C5.7 Support responsible extraction of raw materials	1 to 5	
			MATERIALS C5.8 Support transparency and safer chemistry	1 to 5	
			MATERIALS C5.9 Support sustainability in materials manufacturing	5	
			MATERIALS C5.10 Support sustainability in plant production	1 to 5	
0	0	0	6: SITE DESIGN - HUMAN HEALTH + WELL-BEING	Possible Points:	30
			HHWB C6.1 Protect and maintain cultural and historic places	2 to 3	
			HHWB C6.2 Provide optimum site accessibility, safety, and wayfinding	2	
			HHWB C6.3 Promote equitable site use	2	
			HHWB C6.4 Support mental restoration	2	
			HHWB C6.5 Support physical activity	2	
			HHWB C6.6 Support social connection	2	
			HHWB C6.7 Provide on-site food production	3 to 4	
			HHWB C6.8 Reduce light pollution	4	
			HHWB C6.9 Encourage fuel efficient and multi-modal transportation	4	
			HHWB C6.10 Minimize exposure to environmental tobacco smoke	1 to 2	
			HHWB C6.11 Support local economy	3	
0	0	0	7: CONSTRUCTION	Possible Points:	17
Y			CONSTRUCTION P7.1 Communicate and verify sustainable construction practices		
Y			CONSTRUCTION P7.2 Control and retain construction pollutants		
Y			CONSTRUCTION P7.3 Restore soils disturbed during construction		
			CONSTRUCTION C7.4 Restore soils disturbed by previous development	3 to 5	
			CONSTRUCTION C7.5 Divert construction and demolition materials from disposal	3 to 4	
			CONSTRUCTION C7.6 Divert reusable vegetation, rocks, and soil from disposal	3 to 4	
			CONSTRUCTION C7.7 Protect air quality during construction	2 to 4	
0	0	0	8. OPERATIONS + MAINTENANCE	Possible Points:	22
Y			O+M P8.1 Plan for sustainable site maintenance		
Y			O+M P8.2 Provide for storage and collection of recyclables		
			O+M C8.3 Recycle organic matter	3 to 5	
			O+M C8.4 Minimize pesticide and fertilizer use	4 to 5	
			O+M C8.5 Reduce outdoor energy consumption	2 to 4	
			O+M C8.6 Use renewable sources for landscape electricity needs	3 to 4	
			O+M C8.7 Protect air quality during landscape maintenance	2 to 4	
0	0	0	9. EDUCATION + PERFORMANCE MONITORING	Possible Points:	11
			EDUCATION C9.1 Promote sustainability awareness and education	3 to 4	
			EDUCATION C9.2 Develop and communicate a case study	3	
			EDUCATION C9.3 Plan to monitor and report site performance	4	
0	0	0	10. INNOVATION OR EXEMPLARY PERFORMANCE	Bonus Points:	9
			INNOVATION C10.1 Innovation or exemplary performance	3 to 9	
YES	?	NO			
0	0	0	TOTAL ESTIMATED POINTS	Total Possible Points:	200
			KEY	SITES Certification levels	Points
YES	Project confident points are achievable			CERTIFIED	70
?	Project striving to achieve points, not 100% confident			SILVER	85
NO	Project is unable to achieve these credit points			GOLD	100
				PLATINUM	135

FIGURE 5.60: SITES® v2 Scorecard (Sustainable SITES Initiative, 2014).

YES	?	NO			
0	0	0	1: SITE CONTEXT	Possible Points:	13
Y			CONTEXT P1.1	Limit development on farmland	
Y			CONTEXT P1.2	Protect floodplain functions	
Y			CONTEXT P1.3	Conserve aquatic ecosystems	
Y			CONTEXT P1.4	Conserve habitats for threatened and endangered species	
3			CONTEXT C1.5	Redevelop degraded sites	3 to 6
4			CONTEXT C1.6	Locate projects within existing developed areas	4
		0	CONTEXT C1.7	Connect to multi-modal transit networks	2 to 3
0	0	0	2: PRE-DESIGN ASSESSMENT + PLANNING	Possible Points:	3
X		N	PRE-DESIGN P2.1	Use an integrative design process	
Y			PRE-DESIGN P2.2	Conduct a pre-design site assessment	
Y			PRE-DESIGN P2.3	Designate and communicate VSPZs	
3			PRE-DESIGN C2.4	Engage users and stakeholders	3
0	0	0	3: SITE DESIGN - WATER	Possible Points:	23
Y			WATER P3.1	Manage precipitation on site	
Y			WATER P3.2	Reduce water use for landscape irrigation	
		0	WATER C3.3	Manage precipitation beyond baseline	4 to 6
4			WATER C3.4	Reduce outdoor water use	4 to 6
4			WATER C3.5	Design functional stormwater features as amenities	4 to 5
4			WATER C3.6	Restore aquatic ecosystems	4 to 6
0	0	0	4: SITE DESIGN - SOIL + VEGETATION	Possible Points:	40
Y			SOIL+VEG P4.1	Create and communicate a soil management plan	
Y			SOIL+VEG P4.2	Control and manage invasive plants	
Y			SOIL+VEG P4.3	Use appropriate plants	
4			SOIL+VEG C4.4	Conserve healthy soils and appropriate vegetation	4 to 6
4			SOIL+VEG C4.5	Conserve special status vegetation	4
3			SOIL+VEG C4.6	Conserve and use native plants	3 to 6
4			SOIL+VEG C4.7	Conserve and restore native plant communities	4 to 6
		0	SOIL+VEG C4.8	Optimize biomass	1 to 6
1			SOIL+VEG C4.9	Reduce urban heat island effects	4
		0	SOIL+VEG C4.10	Use vegetation to minimize building energy use	1 to 4
4			SOIL+VEG C4.11	Reduce the risk of catastrophic wildfire	4

FIGURE 5.61: SITES® v2 Scorecard: Sections 1-4
(Sustainable SITES Initiative, 2014).

P1.1-4: These prerequisites are met. Site is not farmland, all development is designed for floods, aquatic ecosystems are not disturbed, and all existing habitats—like mangroves—are conserved.

C1.5: Met. This project will redevelop the degraded soils, hardscape, and vegetation from the previous site.

C1.6: Met. This project is located within an existing developed area of the Everglades National Park.

C1.7: Not met. Does not connect to multiple transit networks.

P2.1: Not met. This project is independent research.

P2.2-3: Met. See site Analysis on page X for pre-design assessment. VSPZ encompasses the design to conserve large areas of existing trees and only specifying perennials.

C2.4: NPS stakeholders were consulted pre-design. This research will go to the future concessioner.

P1.1-2: Met. Precipitation runoff from buildings and hardscapes will be directed to water 'showcase' planting areas. Specified are native and require little to no water.

C3.3: Not met. The design of this project does not include accommodation of a certain percentile precipitation event

C3.4: Met. No water features, and little irrigation needed.

C3.5: Met. Stormwater collected in showcase rain gardens.

C3.6: Met. Shoreline is protected and undeveloped.

P4.1-3: Met. Stable soils will be brought onsite only for building and hardscape foundations. All other native soils are conserved. Only native, non-invasive plants are used.

C4.4: Met. Soils and existing vegetation conserved, only X trees removed (and transplanted) during construction.

C4.5: Met. Mangroves and other species are untouched.

C4.6: Met. All plants introduced are native. See page XX.

C4.7: Met. Ecosystems reintroduced, see page XX.

C4.8: Not met. Project's BDI is not determined.

C4.9: Met. Hardscape minimized and shaded by trees.

C4.10: Not met. Trees near buildings unsafe for hurricanes.

C4.11: Met. Plant biomass removal through maintenance.

0	0	0	5: SITE DESIGN - MATERIALS SELECTION	Possible Points:	41
Y			MATERIALS P5.1 Eliminate the use of wood from threatened tree species		
2			MATERIALS C5.2 Maintain on-site structures and paving		2 to 4
		0	MATERIALS C5.3 Design for adaptability and disassembly		3 to 4
3			MATERIALS C5.4 Use salvaged materials and plants		3 to 4
3			MATERIALS C5.5 Use recycled content materials		3 to 4
3			MATERIALS C5.6 Use regional materials		3 to 5
		0	MATERIALS C5.7 Support responsible extraction of raw materials		1 to 5
1			MATERIALS C5.8 Support transparency and safer chemistry		1 to 5
5			MATERIALS C5.9 Support sustainability in materials manufacturing		5
1			MATERIALS C5.10 Support sustainability in plant production		1 to 5

0	0	0	6: SITE DESIGN - HUMAN HEALTH + WELL-BEING	Possible Points:	30
			HHWB C6.1 Protect and maintain cultural and historic places		2 to 3
2			HHWB C6.2 Provide optimum site accessibility, safety, and wayfinding		2
2			HHWB C6.3 Promote equitable site use		2
2			HHWB C6.4 Support mental restoration		2
2			HHWB C6.5 Support physical activity		2
2			HHWB C6.6 Support social connection		2
		0	HHWB C6.7 Provide on-site food production		3 to 4
4			HHWB C6.8 Reduce light pollution		4
		0	HHWB C6.9 Encourage fuel efficient and multi-modal transportation		4
1			HHWB C6.10 Minimize exposure to environmental tobacco smoke		1 to 2
3			HHWB C6.11 Support local economy		3

0	0	0	7: CONSTRUCTION	Possible Points:	17
Y	?		CONSTRUCTION P7.1 Communicate and verify sustainable construction practices		
Y	?		CONSTRUCTION P7.2 Control and retain construction pollutants		
Y	?		CONSTRUCTION P7.3 Restore soils disturbed during construction		
	?		CONSTRUCTION C7.4 Restore soils disturbed by previous development		3 to 5
	?		CONSTRUCTION C7.5 Divert construction and demolition materials from disposal		3 to 4
	?		CONSTRUCTION C7.6 Divert reusable vegetation, rocks, and soil from disposal		3 to 4
	?		CONSTRUCTION C7.7 Protect air quality during construction		2 to 4

FIGURE 5.62: SITES® v2 Scorecard: Sections 5-7
(Sustainable SITES Initiative, 2014).

P5.1: Met. All decking materials will be TREX substitute.
C5.2: Met. This project maintains existing lift station, Guy Bradley Trail, and redevelops over previous road footprint.
C5.3: Not met. Project does not construction specifications or construction documents.
C5.4: Met. Trees removed for construction to be transplanted.
C5.5: Met. TREX + recycled crushed concrete for foundations.
C5.6: Met. All materials and plants sourced from southern FL.
C5.7: Not met. Raw materials extraction not addressed.
C5.8: Met. Use materials without finishes. Manufacturers with completed chemical hazard assessments to be used.
C5.9: Met. Select materials from sustainable manufactures.
C5.10: Met. Support only sustainable nurseries, and use seed propagation wherever possible in planting design.

C6.1: Met. Existing trail and site's main viewshed preserved.
C6.2: Met. Site includes ADA, path lighting, and signage.
C6.3: Met. Multiple free/public amenities available on site. Project provides educational opportunity for local community.
C6.4: Met. Quiet/shaded/private areas provided with seating.
C6.5: Met. Trails for hiking are on site. Indoor space for fitness/yoga provided. Dock area as kayak/canoe launch point.
C6.6: Met. Gathering for large groups provided: lodge, dock and conference room. Small groups: eco-bungalow clusters.
C6.7: Not met. On-site food production would attract pests.
C6.8: Met. Dim, solar-powered lighting for paths and parking.
C6.9: Not met. Flamingo is only accessible by car. The Everglades Park has a plan to introduce a shuttle in the future.
C6.10: Met. Smoking to be prohibited on site.
C6.11: Met. Local workers to be employed and local materials to used during the project's construction.

P7.1-3: Unable to determine. These decisions would largely be left up to the contractor selected by Flamingo's future business concessioner.
C7.4-7: Unable to determine. These decisions would largely be left up to the contractor selected by Flamingo's future business concessioner.

0	0	0	8. OPERATIONS + MAINTENANCE	Possible Points:	22
Y			O+M P8.1	Plan for sustainable site maintenance	
Y			O+M P8.2	Provide for storage and collection of recyclables	
3			O+M C8.3	Recycle organic matter	3 to 5
4			O+M C8.4	Minimize pesticide and fertilizer use	4 to 5
2			O+M C8.5	Reduce outdoor energy consumption	2 to 4
3			O+M C8.6	Use renewable sources for landscape electricity needs	3 to 4
2			O+M C8.7	Protect air quality during landscape maintenance	2 to 4

0	0	0	9. EDUCATION + PERFORMANCE MONITORING	Possible Points:	11
3			EDUCATION C9.1	Promote sustainability awareness and education	3 to 4
		0	EDUCATION C9.2	Develop and communicate a case study	3
		0	EDUCATION C9.3	Plan to monitor and report site performance	4

0	0	0	10. INNOVATION OR EXEMPLARY PERFORMANCE	Bonus Points:	9
3			INNOVATION C10.1	Innovation or exemplary performance	3 to 9

YES ? NO

0	0	0	TOTAL ESTIMATED POINTS	Total Possible Points:	200
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KEY	SITES Certification levels	Points
YES Project confident points are achievable	CERTIFIED	70
? Project striving to achieve points, not 100% confident	SILVER	85
NO Project is unable to achieve these credit points	GOLD	100
	PLATINUM	135

FIGURE 5.63: SITES v2 Scorecard: Sections 8-10
(Sustainable SITES Initiative, 2014).

P8.1: Met. Sustainable site maintenance to be used

P8.2: Met. Designated area for recycle and compost, as well as recycle bins throughout site.

C8.3: Met. Organic matter from plant maintenance and food waste used as compost and product then used as fertilizer.

C8.4: Met. Compost eliminates need for synthetic fertilizer.

C8.5: Met. Solar site lighting, cross-ventilation in buildings and composting toilets used in eco-bungalows.

C8.6: Met. Solar site lighting used.

C8.7: Met. Vegetation requiring mow maintenance not used.

C9.1: Met. The central concept of an ecolodge is to educate visitors about sustainability. Many exhibits, signage, and spaces for educational talks/events are included on site.

C9.2: Not met. There is not a plan to transition this design/ research project into a case study.

C9.3: Not met. There is no plan in place for continual monitoring or site performance.

C10.1: Met. This project innovates in ways outside of the SITES rating system—namely Mehta's ecolodge criteria.

The total of points estimated in this practice score for

a sustainable ecolodge for Flamingo is **96 points**.

Meaning, this ecolodge project could potentially achieve the

SILVER Level of SITES Certification.

Again, it is important to acknowledge that this score is an *estimate* based on the concepts and responses introduced in this site design. A better informed score could be given if: 1) the site design was developed in a multi-disciplinary team, 2) the design was intended for construction, and 3) more time was allowed for in-depth research and response for each of the 10 SITES sections.



FIGURE 6.0: Flamingo District Entry (Steward, 2017)



06

CONCLUSIONS

CONCLUSIONS

PROJECT SIGNIFICANCE & OUTCOMES

The basic ecotourism model has three parts: to conserve the environment, to provide interpretation for guests, and to improve the lives of local people. The challenge of designing an ecolodge lies in finding ways to equally conserve the environment and engage and benefit local community.

In an assessment of ecolodge development in the 21st century, H. Ceballos-Lascurain states; “the most important thing about an ecolodge is that the lodge is not the most important thing” (Ceballos-Lascurain, 2005, 212). But rather it is the surrounding environment and its quality that matters most. In other countries, like Costa Rica and Kenya, many ecolodges have successfully balanced these three components creating an overall trend towards ecolodges and ecotourism operations and shifting away from traditional accommodation types. However, as the U.S. tourism market continues to grow, there is yet to be a notable ecolodge presence in the U.S.

Some ecotourism experts would argue that true ecotourism—equally finding balance between conservation, guest interpretation, and community support—will never be possible to create in the U.S.

Many believe it is the ‘supporting local communities’ aspect of ecotourism which cannot be met. Developing tourism facilities that preserve, educate, and enhance the lives of Native Americans in the U.S. may be possible, but cannot be thought of or executed in the same way as in a typical ecolodge. But even if an ecolodge in the U.S. cannot cater to “indigenous” people, it certainly can be inclusive and provide opportunities for the surrounding local community and its people. Meaning, a modified ecolodge model could work in the U.S.

The research question of this project aimed to discover what ecotourism can offer the United States:

“How can authentic ecolodge criteria and sustainable site design principles be adapted and applied to inform the design of an ecolodge at the Flamingo District in Everglades National Park?”

Analyzing ecolodge design criteria, specifically Mehta’s 2010, revealed that the U.S. does have programs suitable to guide some aspects of ecolodge design, including LEED, SITES®, and Florida’s Green Lodging Program, which provide guidelines and standards for sustainability. The missions of these programs

coincides with many goals of ecolodge design, and certification from these programs could strengthen an ecolodge project. However, there are three ecolodge criteria that fall outside the scope of LEED, SITES®, and the Green Lodging Program: 1) *“Fit into specific physical and cultural contexts through careful attention to form, landscaping, and color as well as through the use of vernacular architecture; 2) utilize traditional building techniques during construction; and, 3) Endeavor to work with the local community, including community members, wherever possible, in the initial physical planning and design stages of construction* (Mehta, 2010, 11). For this reason, ecolodge design needs its own certification system. If the ecotourism industry can progress from ecolodge guidelines (which are largely unknown and used only by developers, non-governmental organizations, and consultants) to an international ecolodge certification, truly authentic ecolodges will become the standard, and issues with greenwashing will begin to diminish (Mehta, 2007).

Through this project, it became apparent that the Flamingo District has a very strong need for a new lodge facility. During data collection, interviews with two Everglades’ NPS professionals revealed that although Flamingo currently lacks accommodations and has specific development challenges, the park is continuing to see an

increased number, and more diverse group, of visitors every year. It is believed, from this project’s findings that an ecolodge will be a positive benefit to park users.

The proposed ecolodge is successful in terms of sustainable design and ecolodge authenticity. A Silver SITES® rating is estimated to be achieved in this project. Four authentic ecolodge criteria are met:

1. *Meet energy needs through passive design and renewable sources.*
2. *Use environmentally friendly sewage treatment systems.*
3. *Fit into specific physical and cultural contexts through careful attention to form, landscaping, and color as well as through the use of vernacular architecture.*
4. *Have minimal impact on the natural surroundings and utilize traditional building techniques during construction.*

In addition to the ecolodge, the proposed site design includes: a native, salt tolerant, and wind tolerant plant palette; unique architectural style developed through historical research and communicated to visitors through an interpretive exhibit; and, building program and sustainable technologies to be used for

eco-bungalows and the main lodge building. However, the 'benefitting community' aspect of ecolodge design remains the most difficult aspect to address. Flamingo as a district creates many seasonal and some full-time jobs for people living in the surrounding community. The Everglades National Park also economically benefits the communities surrounding it through tourism revenue. The ecolodge design for Flamingo includes spaces and exhibits for interpretation on site. These amenities can provide educational experiences for local people as well as guests. But ultimately, the success of engaging the surrounding communities, organizing enriching events, and putting forth the effort of continual communication and support of local people lies in the management of the Flamingo lodge. The hope is that this proposal can motivate the selected business concessioner to choose to manage Flamingo's lodge as an ecolodge in order to engage the local community.

There is no lack of opportunity for ecolodge-like accommodations in the U.S., but in fact a suitable niche for ecolodges within the National Park system. This research and projective design project argues that ecolodges in the U.S. are indeed possible. The ecolodge design presented in this project can bring cultural, environmental, and interpretive value to the Flamingo district. An ecolodge at Flamingo could create a more memorable and educational experience of the built environment for park visitors, and intervene on the land in a more sustainable manner. This project can be used for idea generation, inspiration, and guidance for the future concessioner of Flamingo as

they will soon begin the planning and construction of a new facility. Hopefully this project can make Flamingo's future concessioner pause to consider sustainable development alternatives in lieu of standard or traditional construction methods and design.

PROJECT LIMITATIONS

Time is the most notable limitation of this project. Each section; background research, methodology design, data collection, and design, could be expanded if more time was given. However, with the time that is allowed, this project is successful in providing relevant answers and design solutions to meet the original research question. In data collection, the number of precedent ecolodges studied could be expanded. The specific precedent selection criteria was narrow and excluded many successful ecolodges from this analysis. Studying an array of ecolodge precedents could have revealed additional design strategies for Flamingo.

Another limitation of this project is site specificity. The design presented is not a catch-all ecolodge model for the NPS and cannot be replicated across the nation. Much of the importance of this work is focused on a unique site response. Climate, topography, wildlife, soil quality, existing vegetation, and the surrounding community greatly influence ecolodge design and sustainable strategies employed. Ecolodges in other U.S. National Parks would need to respond to the sites' environmental and cultural context.

During the design phase, a SITES® score was given, but this estimate hinges on many factors that would be decided during the construction phase of the project. Without direct and regular access to the site and its specific physical details, the SITES® standards are less applicable.

The last limitation of this project is the lack of a multidisciplinary team. It is necessary to work with other professionals; architects, planners, biologists, arborists, soil scientists, etc. when developing a sustainable site (a SITES® prerequisite) and specifically when developing an ecolodge. Collaborating with a team of designers and professionals educated on sustainability and environmental systems would add depth to the project.

FUTURE RESEARCH

The future of Flamingo will undoubtedly include construction of a new lodge facility. If the selected Flamingo business concessioner chooses to implement an ecolodge instead of a traditional lodge, this work could be referenced and expanded by the chosen contractor, architect, or landscape architect.

The background of this project attempts to synthesize ecotourism, ecolodge design, sustainable site design, and national park development. This knowledge could be expanded by future students to study and design a site in a different National Park. This variety of ecolodge exploration would

strengthen the claim that ecolodges are indeed appropriate for National Parks and reinforce the call for more ecolodges in the United States.

PROJECT REFLECTION

The methodology and underlying research employed through this project has informed the creation of an appropriate ecolodge design for the Flamingo District, of the Everglades National Park. This solution was reached through comprehensive research in the forms of: literature review, precedent studies, interviews, on-site observation, site analysis, and design.

In hindsight, the site location of this project had both pros and cons. If the project site, for example, was in Rocky Mountain National Park the project could have included multiple site visits and overall more time spent on-site due to proximity of author. A more accessible site location could have contributed deeper site analysis research and possibly more detailed design focuses. However, the Flamingo District of the Everglades was chosen not for its location or scenery, but rather for its clear *need* of a lodge project. There has been a call for a concessioner to build a new lodge for over 10 years. Perhaps this is a sign that Flamingo's lodging needs to be designed *not* to the standard that is found in every other National Park in the U.S. Flamingo is the perfect testing ground for a new lodging type—the modified U.S. ecolodge model.



FIGURE 70: Sunset over the Everglades (Steward, 2017)



APPENDICES

APPENDIX A | REFERENCES

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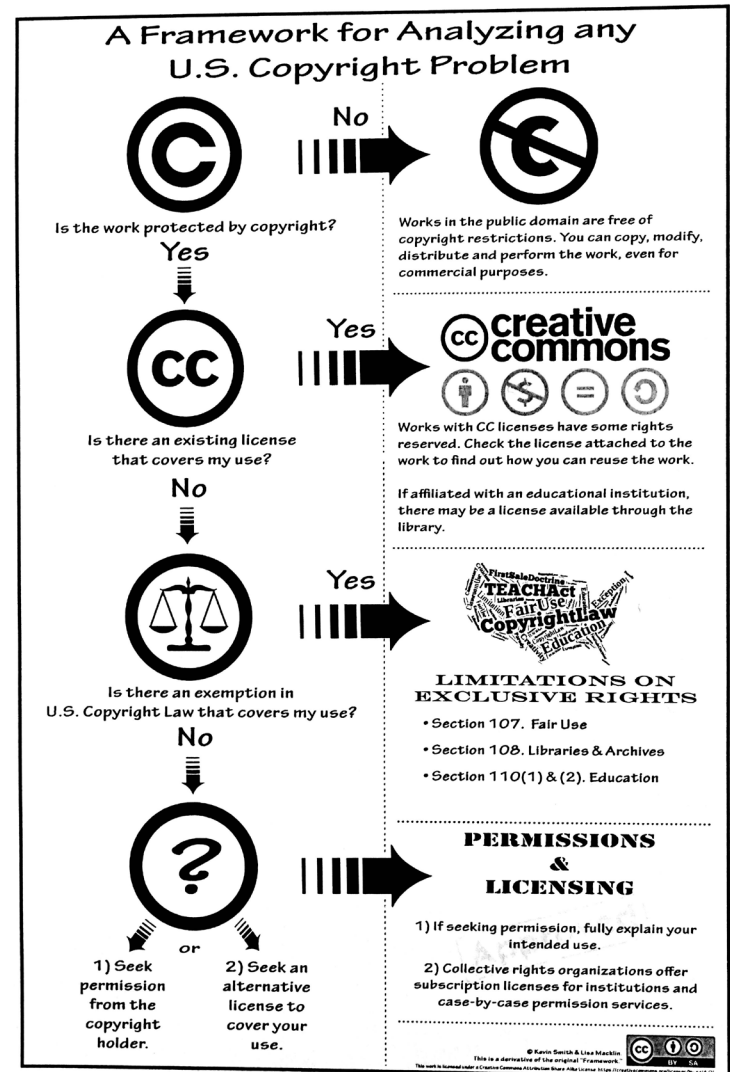
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- FIGURE 5.49: Steward, Kelsey. (2017). *Interpretation Opportunities*. Adobe Photoshop, AutoCAD, and hand sketching.
- FIGURE 5.50: Steward, Kelsey. (2017). *View of Interpretation Dock*. Google Sketch-Up, Adobe Photoshop, and hand sketching.
- FIGURE 5.51: Steward, Kelsey. (2017). *Eco-Bungalow Site Location*. Adobe Photoshop, AutoCAD and hand sketching.
- FIGURE 5.52: Steward, Kelsey. (2017). *2-Bed Eco-Bungalow Floor Plan*. Sketch.
- FIGURE 5.53: Steward, Kelsey. (2017). *Eco-Bungalow Elevation*. Sketch and Adobe Photoshop.
- FIGURE 5.54: Steward, Kelsey. (2017). *View of Manatee Bungalow Cluster*. Google Sketch-Up, Adobe Photoshop, and hand sketching.

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- FIGURE 6.0: Steward, Kelsey. (2017). *Flamingo District Entry*. Photo.
- FIGURE 7.0: Steward, Kelsey. (2017). *Sunset over the Everglades*. Photo.

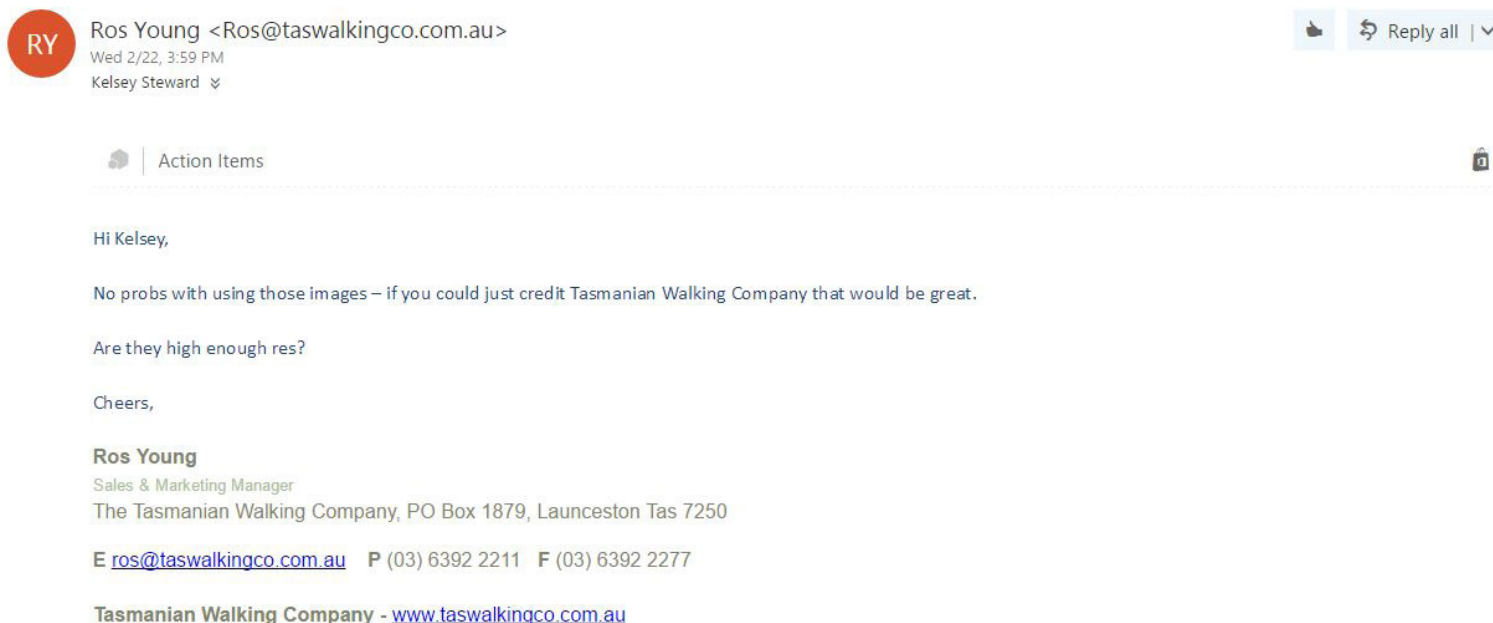
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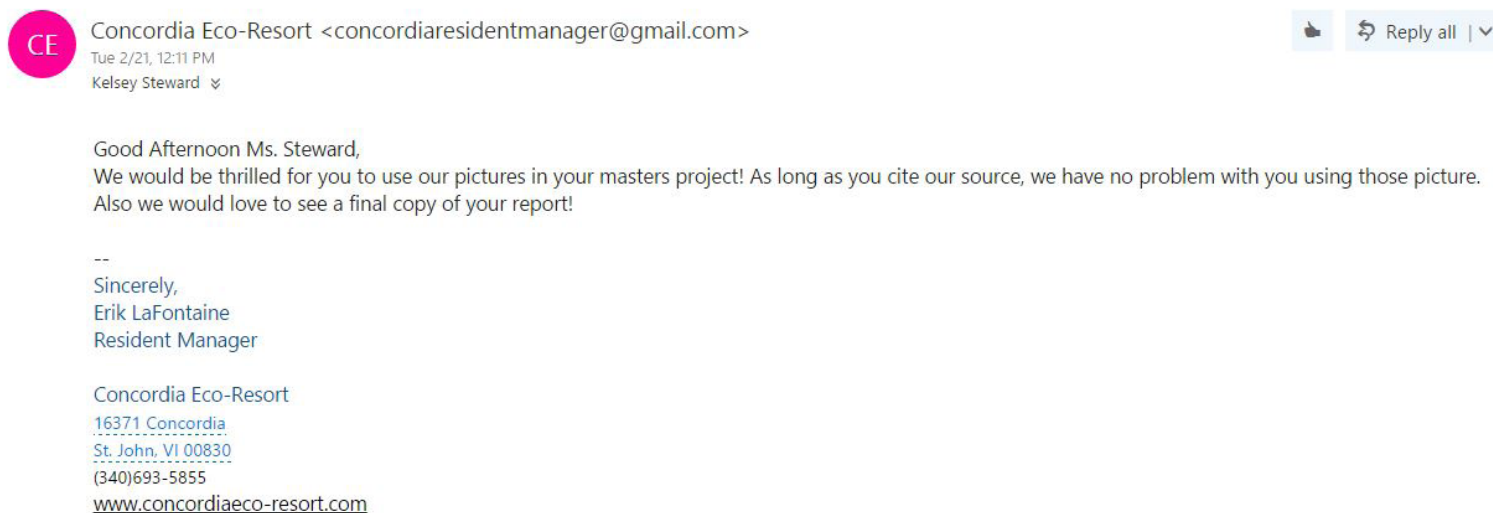
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- Figure 4.1 Tasmania Walking Company. (2017). *Bay of Fires Lodge*. Photo. Accessed on February 2, 2017 from: <https://www.taswalkingco.com.au/bay-of-fires-lodge-walk/accommodation/>
- Figure 4.2 Tasmania Walking Company. (2017). *Lodge Materiality*. Photo. Accessed on February 2, 2017 from: <https://www.taswalkingco.com.au/bay-of-fires-lodge-walk/accommodation/>



- Figure 4.3 Concordia Eco-Resort. (2017). *Concordia Eco-tents*. Photo. Accessed on February 2, 2017 from: <http://www.concordiaeco-resort.com/unit-gallery/premium-eco-tent/>.
- Figure 4.4 Concordia Eco-Resort. (2017). *Eco-tent Detail*. Photo. Accessed on February 2, 2017 from: <http://www.concordiaeco-resort.com/unit-gallery/premium-eco-tent/>.



- Figure 4.7 Amble Resorts. (2017). *Isla Palenque Aerial*. Photo. Accessed on February 2, 2017 from: <http://www.amble.com/IslaPalenque/Galleries/Resort>.
- Figure 4.8 Amble Resorts. (2017). *Jungle Rooms*. Photo. Accessed on February 2, 2017 from: <http://www.amble.com/IslaPalenque/Galleries/Resort>.



Benjamin Loomis <bal@amble.com>

Tue 2/21, 6:00 PM

Kelsey Steward



Reply all | v

Kelsey-

Sure, feel free to use the photo in your work. No need to provide any credits.

Best,

Ben

...

- Figure 5.40: Clark, Merald. (2017). *Calusa People Preparing for Fishing the Estuary*. Artwork. Florida Museum of Natural History. Accessed on February 21st 2017 from: <https://www.flmnh.ufl.edu/sflarch/research/calusa-domain/>.
- Figure 5.38: Clark, Merald. (2017). *Calusa's King's House*. Artwork. Florida Museum of Natural History. Accessed on February 21st 2017 from: <https://www.flmnh.ufl.edu/sflarch/research/calusa-domain/>.



Sarah Fazenbaker <sfaze@flmnh.ufl.edu>

Wed 2/22, 8:40 AM

Kelsey Steward ▾



Reply all ▾

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Thank you for contacting the Florida Museum of Natural History. Best of luck with your project.

Regards,
Sarah

--

Sarah Fazenbaker
Web Services Manager | Web Developer
Florida Museum of Natural History
University of Florida | [Gainesville, FL 32611](https://www.flmnh.ufl.edu)
www.flmnh.ufl.edu

- Figure 5.42: AST Exhibits. (2015). Calusa Village Exhibit. Photo. Accessed on February 21st from: <http://www.astexhibits.com/marco-island-historical-museum/>.
- Figure 5.43: AST Exhibits. (2015). Native Cypress Lumber. Photo. Accessed on February 21st from: <http://www.astexhibits.com/marco-island-historical-museum/>.
- Figure 5.44: AST Exhibits. (2015). Shell Mound Foundation. Photo. Accessed on February 21st from: <http://www.astexhibits.com/marco-island-historical-museum/>.
- Figure 5.45: AST Exhibits. (2015). Calusa Chickee Huts. Photo. Accessed on February 21st from: <http://www.astexhibits.com/marco-island-historical-museum/>.

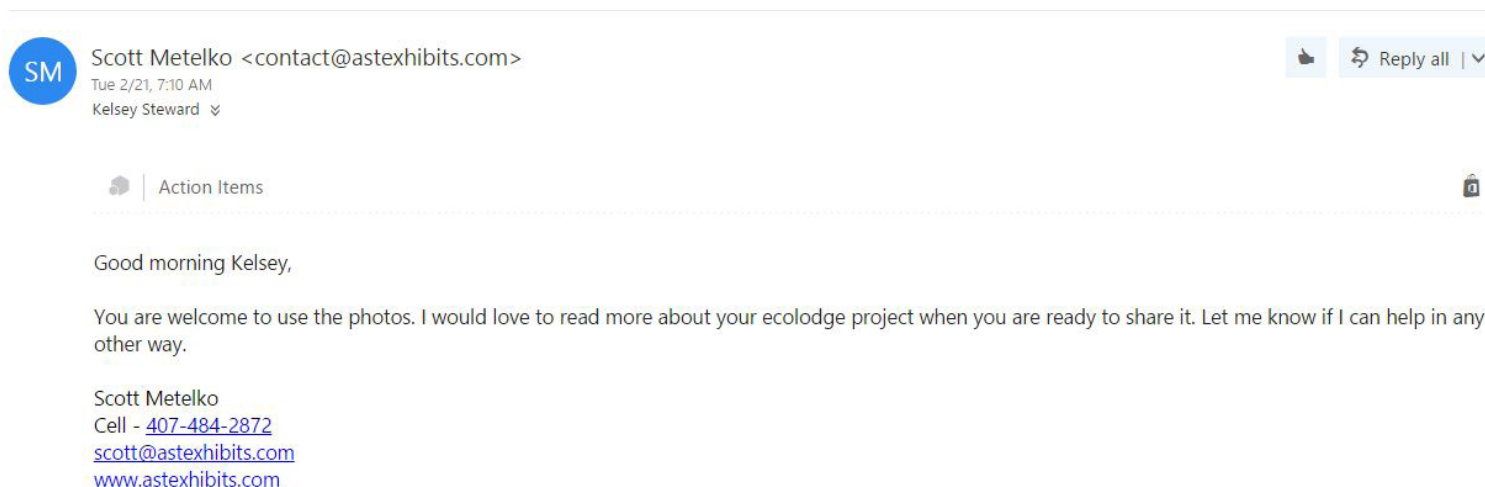
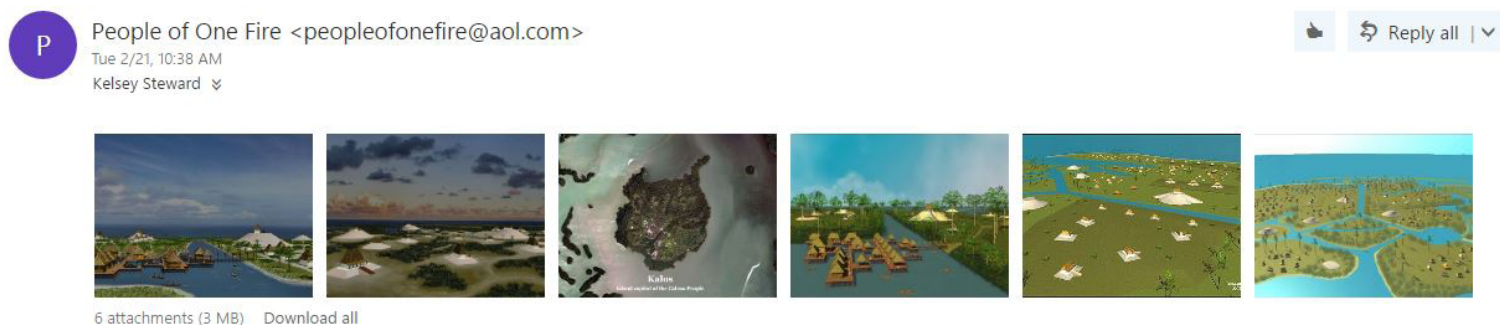


Figure 5.41: Thornton, Richard. (2014). Calos: Island Capital of the Calusa People. Architectural Rendering.



Richard L. Thornton

Registered Architect & City Planner

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Electronically signed this 21st day of February 2017.

Richard L Thornton, Registered Architect
GA License #RA 003459

APPENDIX C

INTERVIEW MATERIALS

Interview Materials Included:

- IRB Approval Letter
- Interviewee Cover Letter and Questions
- Interviewee signed Consent Form
- Interview Transcript

TO: Jessica Canfield
LARC
Seaton Hall

Proposal Number: 8533

FROM: Rick Scheidt, Chair
Committee on Research Involving Human Subjects

DATE: 11/08/2016

RE: Proposal Entitled, "Nature-based tourism site plan and accommodation design proposal and research study for Flamingo in the Everglades National Park"

The Committee on Research Involving Human Subjects / Institutional Review Board (IRB) for Kansas State University has reviewed the proposal identified above and has determined that it is EXEMPT from further IRB review. This exemption applies only to the proposal - as written - and currently on file with the IRB. Any change potentially affecting human subjects must be approved by the IRB prior to implementation and may disqualify the proposal from exemption.

Based upon information provided to the IRB, this activity is exempt under the criteria set forth in the Federal Policy for the Protection of Human Subjects, 45 CFR §46.101, paragraph b, category: #2, subsection: ii.

Certain research is exempt from the requirements of HHS/OHRP regulations. A determination that research is exempt does not imply that investigators have no ethical responsibilities to subjects in such research; it means only that the regulatory requirements related to IRB review, informed consent, and assurance of compliance do not apply to the research.

Any unanticipated problems involving risk to subjects or to others must be reported immediately to the Chair of the Committee on Research Involving Human Subjects, the University Research Compliance Office, and if the subjects are KSU students, to the Director of the Student Health Center.

January, 2016
Everglades National Park Officials
Flamingo District, Everglades National Park, Florida

Hello, I am sending you this request to be interviewed as I am studying the site of the Flamingo District for my master's project in Landscape Architecture.

My name is Kelsey Steward, and I am a fifth year and graduate student in Landscape Architecture at Kansas State University. For my final year in the program I am required to develop a master's report relating to areas of study within Landscape Architecture. I have always been interested in the National Park Service and Tourism, and after last summer spent studying ecotourism and living at ecolodges, I knew I wanted to pursue a master's project focused in a more natural, non-urban environment. This has led me to choose the Flamingo District as the study site for my project focused on nature-based tourism in the American National Park setting. My hopes are to use Flamingo, Florida as a model for how nature-based tourism and ecolodge development can be introduced into the public realm of the National Parks.

The main question of my report is: *"Because ecolodges have found success in developing countries but are less popular in developed countries, what opportunities can low-impact site planning combined with ecolodge development reveal for tourist accommodation sites in or adjacent to American National Parks?"*

My methodology is four part: 1) Site Inventory and Analysis 2) Ecolodge and Nature-Based Tourism Precedent Studies 3) Interviews 4) Site Visit. During my site visit time (between January 5th-6th) I will conduct informal, personal interviews. The expected duration of the interview is approximately 30 minutes and will be arranged at the place and time of your convenience on these days. The interview questions to be asked are attached for your review, but overall the interview will be a conversational meeting to help me learn more about Flamingo including its history, challenges, unique qualities, tourism trends, and future.

Permission has already been granted from the Kansas State Institutional Review Board (IRB) for conducting interviews. I am also asking permission to include your name in my report. Also, I am asking permission to record our discussion to accurately document the interview for

my own reference later in the project. If you would prefer to stay anonymous or not be recorded, I will respect that and keep the conversation confidential. Participation in this interview is voluntary, and you are free to leave or refuse to participate at any time before or during the interview.

I know you are a busy professional, especially now as the holiday season approaches. I greatly appreciate your help, experience, and knowledge so that I can strengthen my master's report. I hope that the report will ultimately influence future development in the National Park System and be helpful in the implementation of Flamingo's master plan.

Thank you in advance for your willingness to help,

Kelsey Steward
Kansas State University
Graduate Student in Landscape Architecture
kelseyjsteward@ksu.edu, 620-805-2444

Interview Questions

1. How long have you been working at Flamingo? Can you tell me about your responsibilities; who/what you work with, what your day-to-day is like, etc.?
2. What makes Flamingo unique from other NPS stations in the Everglades? What is the “feel” or “atmosphere” of Flamingo?
3. Can you describe what Flamingo was like directly after Hurricane Katrina—what services or buildings were immediately affected? How long did it take for the district to become functional again and how did you get relief?
4. Now, eleven years later, what have been the lasting impacts of Katrina? In terms of park visitation numbers, services offered, quality of the built environment, health of the surrounding flora and fauna?
5. What is the busiest time of year for Flamingo? Why is this?
6. Can you describe tourism trends or perhaps most frequent tourist types that visit Flamingo. Meaning: do visitors travel as groups, couples, or families and for how long do they stay? What kind of accommodations do they use/want and what services or activities are they seeking at Flamingo. Do you know of a way I can access information about tourist demographics at the Everglades and Flamingo?
7. As a worker, what is your commute like? How many workers are employed at Flamingo overall? Do workers, or have workers lived on site? What are the obstacles of on-site living?
8. I’m aware of the \$2 million dollar Partners in Preservation grant to improve Flamingo’s visitor center. Is this work complete? How has this helped you in your job? What effects of this grant have you noticed if any?
9. What challenges is Flamingo facing right now?
10. Do you feel that the Flamingo district is threatened environmentally today? If so, in which ways?
11. Are you familiar with the existing master plan for Flamingo developed by Smith Dahlia Architects and Robert Peccia and Associates as part of the IDIQ contract? Have you seen any phases of this plan implemented?
12. What effects from can this master plan (good or bad) do you predict? Are there any areas you are excited for or concerned about?
13. Is there any additional infrastructure that you think Flamingo needs to improve for accommodations, tours, or activities?
14. What is your perception of ecotourism? What role do you think ecotourism serves in the National Park System? What limitations or potential problems?
15. In your opinion, would an ecolodge (a sustainably built tourist accommodation facility that benefits local people, protects the surrounding environment, and provides interpretation to local people and guests) be feasible at Flamingo.
16. What do you enjoy most about working at Flamingo?

INTERVIEWEE CONSENT FORMS

CONSENT TO INTERVIEW

Researcher: Kelsey Steward 6208052444 kelseyjsteward@ksu.edu
Institution: Kansas State University
Project Title: Nature-based Tourism projective design and master plan for the Flamingo District in the Everglades National Park

The purpose of this open-ended interview is to provide background information about, management strategies for, and the history of the Flamingo District. The focus of my Master's Report is ecotourism and nature-based tourism within American National Parks, and my project is using the Flamingo District as a site for a hypothetical, projective nature-based tourism master plan. Interviews will help inform my design work. When using interview responses in my report, your name will be withheld but your professional role will be identified. The interview will be open-ended, conversational in style, and expected to last approximately 30 minutes. The interview will be recorded. This recording will be used for my reference only and portions will be transcribed. Your participation is completely voluntary and you are free at any point to withdraw your consent to be interviewed as part of this study. By signing this form, you are indicating that you have read and understand this form and are willing to participate.

Participant Name: Bob Stower
Participant Signature: [Signature]
Date: 1/5/17

You are free to contact me the researcher, or the Kansas State IRB contact below at any time if you have further questions about this study. A copy of my final report will be sent to you upon completion. Thank you for your participation!

Kansas State IRB Chair: Rick Scheidt 785-532-1483 rscheidt@ksu.edu

CONSENT TO INTERVIEW

Researcher: Kelsey Steward 6208052444 kelseyjsteward@ksu.edu
Institution: Kansas State University
Project Title: Nature-based Tourism projective design and master plan for the Flamingo District in the Everglades National Park

The purpose of this open-ended interview is to provide background information about, management strategies for, and the history of the Flamingo District. The focus of my Master's Report is ecotourism and nature-based tourism within American National Parks, and my project is using the Flamingo District as a site for a hypothetical, projective nature-based tourism master plan. Interviews will help inform my design work. When using interview responses in my report, your name will be withheld but your professional role will be identified. The interview will be open-ended, conversational in style, and expected to last approximately 30 minutes. The interview will be recorded. This recording will be used for my reference only and portions will be transcribed. Your participation is completely voluntary and you are free at any point to withdraw your consent to be interviewed as part of this study. By signing this form, you are indicating that you have read and understand this form and are willing to participate.

Participant Name: Fred Herling
Participant Signature: [Signature]
Date: 1-6-17

You are free to contact me the researcher, or the Kansas State IRB contact below at any time if you have further questions about this study. A copy of my final report will be sent to you upon completion. Thank you for your participation!

Kansas State IRB Chair: Rick Scheidt 785-532-1483 rscheidt@ksu.edu

INTERVIEW DIALOGUE: BOB SHOWLER

In-Person Interview
Bob Showler, District Interpreter
Flamingo Visitor Center
Thursday, January 5th 2017, 10:00am

Bold: Me, the interviewer

Non-bold: Mr. Showler, the interviewee

[Introductory conversation, talk about the Visitor Center, my travels the past week through southern Florida, and his work for the week.]

So how many people are working here right now at Flamingo now?

Well Christi and I are interpretive rangers and so we do the visitor center, ranger guided programs and that kind of stuff. There are two of us that are permanent and then currently we have 4 seasonal rangers. Ideally we have as many as 6 during the busy season, but this year we've had some staffing challenges. We will often have volunteers—right now we have two full time volunteers.

So all the tours and talks on the NPS schedule; who leads those?

We all do it; me and Christi or the seasonal staff.

Tell me a little about what you do here, how long have you been here, what your day to day is like and what your official position is called.

I'm called the district interpreter, so that's just for the Flamingo District. I've been here working on and off since the winter of 1979. But I've come and gone working on and off at other national parks. So just the last 8 years I have been full time in charge of the district as far as the visitor center, the ranger-guided programs, hiring, scheduling, supervision, etc.

So your day-to-day must be very diverse

Pretty diverse, yeah. No two days are the same.

Can you tell me a little about visitors at Flamingo?

Basically what I find is that visitors who come to the national park are either day visitors or longer term visitors. I would say Flamingo is definitely for people who have a little bit more time to spend. We get people who stay two weeks in the campground and come back year after year. Some have been coming for 20 or 30 years. This is partially because of the weather because it's so nice down here in the winter, and partially because there's just so much to do and because it is a different kind of environment; different from anywhere else in the States. So we get a lot of people who like going on the ranger programs so they can learn more about this subtropical environment, the unique vegetation, and the different kinds of animals that you can't see elsewhere.

I was just doing a crocodile talk the other day. On one side of us there's a couple of crocodiles and on the other there are manatees and then a spoonbill (the pink bird)

flying overhead. I said to the people; “Where else are you going to see this? Where else in the world can you go and see this all in one place?”

So Flamingo is the name.....do you still see wild Flamingos here?

On rare occasions, yes we do. Back in the 1800s ornithologists were recording numbers of flocks in excess of a thousand birds. But then they were hunted for their meat. We still get them trickling in from the Bahamas, Yucatan, and other areas. Not in any great numbers however. I think the biggest flock I’ve ever seen down here is probably about 30, 35 birds maybe. This is still the best place in the country to see them.

So the visitors that you said come back year after year, who are they? Are they Floridians? Are they retired?

All over the United States, and all different backgrounds. You can find on the NPS website the University of Idaho visitor survey for the Everglades Park survey. We get a lot of retirees, we get people from all over the United States in their RVs. We get a lot of local people from the Miami community. Nowadays we get a lot of Asian people. Many of them are permanently living in the country and come down and visit.

So are these day visitors or campers?

Mostly day visitors, but still some campers. If you noticed in the visitor center we give out our brochures in 9 different languages. We get a lot of variety of people; Germans, Chinese, and French mainly, but also some from the Caribbean as well.

Do you think the numbers of international visitors at Flamingo have gone down since Hurricane Katrina in 2005? Were those the people utilizing the lodge?

That’s a good question and I don’t have the exact statistics for that. I would say that is a fair assumption, although many of our campers at Flamingo are German travellers. We had a lot of locals too who used that lodge. To this day we still have locals who come back here to Flamingo and tell stories about when they stayed at the lodge. And then we get the questions, “So what’s the deal with that? Are you going to get a new lodge down here?” We get that all the time! We get questions about the restaurant too that has closed down. It used to be on the second floor opposite the visitor center. The plan right now is to expand our visitor center over to that space however.

So you weren’t working directly at the park at the time of Katrina. Do you know how long the park or visitor center was closed down?

Well the road to Flamingo was closed for awhile, and the visitor center was closed for even longer because they were working to get the electric back up and running. I know for awhile the ‘visitor center’ consisted of a table outside with maps and brochures with one or two rangers. This lasted maybe a few weeks.

Obviously the lasting impact of hurricane Katrina was the loss of the lodge and the restaurant. Would you say there were additional lasting impacts on Flamingo from the hurricanes?

Those are the major losses for sure. We also lost Flamingo's cottages. The cottages were like individual motel rooms with kitchens; a front room, a bedroom, electric, water, and fully equipped kitchens. So looking forward, the plan for Flamingo is more centered around cottage type lodging and the addition of ecotents. All raised up of course. The reason the cottages were popular was for fishermen. They would come year round and use the kitchens and such.

What is the busiest time at Flamingo? When are the peaks?

It progressively gets busier from October until the peak time from Christmas to New Years. Then it stays pretty busy on until March when it will taper off into May. Then it gets pretty quiet in the summer. It seems as if Flamingo is getting busier all the time. Yea for example, here at the visitor center last year we had a total of 181,000 visitors. When I came here in 2008 we had a number something like 80,000 visitors.

Do you see all ages of travellers, and a diversity of group sizes?

This being a winter park, we proportionally don't see as many kids as other national parks because they are in school. We get ages all the way from mid teens into retired age people here yes.

Do you have visits of school groups with young kids?

Sometimes. The park has an environmental group that does camps with kids, but neither of these camps take place at Flamingo just because the location is so far removed from most school districts.

So you personally commute everyday to work at Flamingo?

Yeah, Christi and I drive down everyday from Homestead. But a lot of the staff do live here at Flamingo.

Is the staff that lives here seasonal staff or full time staff?

The seasonal staff lives here 24 hours for the winter season, so October to late April.

Do you know how many people work here at Flamingo in total? Including the concessioner employees of the marina and boat tours.

This year Flamingo has 35 NPS workers for the winter, and 25 concession workers for the winter.

What all does the current concessioner's operations include?

So right now they run the marina and the café. The marina includes boat tours, marina store, the gas station, and canoe and kayak rentals. Most of these workers live on site.

That's a lot of people.

Yes it is. But you know, back in the old days when there was a lodge and restaurant, there was well over 100 people living over there [in the staff housing] onsite.

The Partners in Preservation Grant, what do you know about this grant? Has the plans or goals of the grant been met?

Penny Delbene is the one who set that all up, she is the Park's historian. Her number is 305-242-7755. She's at headquarters and could help you out. Last I heard that grant is to improve the railing here at the Visitor Center and landscape improvement right around the building. It was truthfully for some cosmetic improvements not structural improvements—it wasn't a huge sum of money. It was sort of something to draw attention to Flamingo all around.

So the RFP is a little confusing. Is it still open?

The last deadline was December 21st and I haven't heard anything since then. Intentionally a lot of us here are not involved in this because it is best that just the core people at headquarters are involved in this. This is for fairness for the bidders and everything.

Are there any challenges that Flamingo is facing right now? Besides the lack of lodging obviously.

Flamingo has always been challenged. Ever since my first winter here in '79 to the present I would say Flamingo, as National Parks go, has significant challenges.

Because of how remote it is?

Partly because of the remoteness, it's 38 miles down the road from headquarters and 50 miles from the closest town. It's in a subtropical environment; it's wet, it can be infested with misquotes, you get rapid decay of things, and technology failing a lot and being difficult to maintain. Just last week for example, no two days ago, we were without phones for awhile. We have computer failure far more than you would expect. We have electrical outages and water and sewage systems failing. Things just break a lot down here. We have this expression down here; 'Oh, it's Flamingo.' Trees grow on and into buildings here, we have issues with rodents, and all kinds of bothersome insects like no-see-ems, to deer flies, to cockroaches. I mean it's out in the subtropical wilderness; nature is constantly trying to get at us!

But that's the thing! The nature is all right here for people to see. If they want to see it, right?

That's the thing, are people coming down here to look at nature or to look at buildings? Sometimes the staff will say, "Oh this place really needs some work!" And I agree, but you know the crocodiles, the manatees, the spoonbills, the tarpins, the sharks, the dolphins—they don't care. They are doing fine. That's why are visitors are coming.

Much of my project is about ecotourism and designing for the ecotourist. Do you feel the people that are coming here now fit that description?

I think so, it depends on your description. When I think of ecotourism, I think of someone going down to Costa Rica or something or Africa. I see an ecotourist as someone going to a lodge that is specifically set up for people to observe nature. That definitely applies here at Flamingo.

Yes, I actually did what you defined. The stereotypical lodge in Costa Rica. The three assets there were to conserve nature, provide interpretation for guests and workers, and support the local community. So maybe the only asset that wouldn't be as applicable here at Flamingo is addressing local people or local community. Although there are obviously local workers..... What do you think about this part?

So another important factor is the economic value of the park, all of the Everglades National Park, to the community. Don't quote me on a number, but I believe it's well over \$150 million to the local community of southern Florida. The value of the park's associated lodging, restaurants and services on the edges of the park bring money and business to those bordering communities.

Would you say most day visitors at Flamingo stay in Florida City or Homestead?

Yea, most of them do. Occasionally they stay in Miami or the upper keys.

Back on the ecotourism thing, do you think there are any limitations or challenges for an ecolodge within the large National Park System.

One of the issues right now for an ecolodge here would be the issue of Sea Level Rise. The park has done an environmental assessment for Flamingo and the Everglades. From this for example, all new development will need to be elevated 13 feet above sea level to ensure safety in the next 50 years. Flamingo amazingly, would probably become an island when sea levels rise because much of the land to the interior is actually lower in elevation than Flamingo. We've thought about mobile lodging alternatives, and as you know are implementing ecotents for the future. We have done a pilot project for the ecotent already. You can see the platform out in the first campground today on our site visit.

I'm sure you know the master plan by RPA and Smith Dahlia and Associates. Has any of this been implemented? They have many program areas and phases indicated.

That masterplan was pretty ambitious, like a major redo of the marina, moving the visitor center, redoing the visitor center, and additional improvements of the campgrounds. Some of this may happen. But if you look at the General Management Plan from NPS, the two documents do not align; they do not have the same requirements or goals. The whole issue of rebuilding the lodge has been stretched over 10 years. In my mind this issue has faded into the background almost because for me I just have to get on with my work and do my job the best I can. The other thing that has happened was the economic downturn of 2008, which likely slowed the rebuilding.

What is your favorite part of working at flamingo?

For me it's because Flamingo is unique. I've worked at different national parks all over the country. In this little tiny sliver of land at the very southern tip of Florida you have more unique life than you might have in the entire state of Alaska or Montana. You have so much stuff down here that's associated with the Caribbean and the Tropics that you just don't get in other parts of the United States. My background is in biology, so I just think it is a fascinating place and there is so much to share with the public. You have an interesting cultural history too. It's a history of failure. Almost everything that humans have tried down here has ended up in failure for one reason or another. Just because of the dominance of nature at Flamingo. People tried to farm the land, ranch, drain the land and build canals, use the land to build factories, and all has failed.

It is a very unique place. You think Flamingo is the most diverse place in the Everglades?

Yes, I would make that argument. There is a higher percentage of tropical species compared to anywhere else in the park. The crocodile is another great example. Crocodiles are hard to find anywhere else in Florida, and it is probably the only place in the world where you can see both crocodiles and alligators in the same place. Another reason I love working at this park is how much I can teach people. For example, I used to work at Zion National Park. I would go take people out on a hike, and there were 2,000 foot tall sandstone cliffs all over the place....not a lot of description needed for people to appreciate it. This one [Flamingo] on the other-hand really requires explanation. People come down here saying, "This is a National Park?!" Then I take them around to see some stuff that they can't see anywhere else in the country and then they begin to get it. It really requires more of a narrative.

This was extremely helpful for my project. Thank you for your responses and taking the time to talk with me!

INTERVIEW DIALOGUE: FRED HERLING

In-Person Interview
Fred Herling, Everglades Park Planner
Rosita's Restaurant, Florida City
Friday, January 6th 2017, 9:00am

Bold: Me, the interviewer

Non-bold: Mr. Herling, the interviewee

[Introductory conversation, talk about the restaurant we are eating, my travels the past week through southern Florida, and his work for the week.]

So are many of the people staying in Florida City going to the Everglades?

Yes many of them, some to the Keys, but most tourists are going to the park. A lot of people are commuting because there is no longer a lodge down there. Obviously you can stay there [Flaming] if you have an RV or if the conditions are good for tent camping. But many people don't have that.

I was surprised by all the international visitors I saw visiting Flamingo yesterday.

Yes, from all over the world. International visitation is big; Europe, China, Japan, and Germany, France, and England especially. Visitors from Asia are steadily increasing.

[break to order breakfast from waitress]

So what all did you get to see yesterday on your visit?

Yesterday we immediately saw manatees, and crocodiles. I interviewed with Bob, and went on a site visit with him. Then we went on a 2-hr canoe trip.

We saw where the Ecotent platform was, there were a fair amount of campers in that area. I saw plenty of campers also in Loop A and in the RV lot, but no one at all in Loop B or Loop C. Do those areas ever get used?

On occasion, mostly just B Loop for overflow.

Did you get a good feel for the operation during your site visit?

Yes, I saw all the facilities, where the workers lived, and where most of the activities took place.

Now, how did the prospectus turn out?

The deadline closed a week or two ago, so we don't know anything yet. We are hopeful because we think this time the proposal is more favorable for a concessioner. The proposal is to come in and operate what you saw yesterday, plus build lodging, build a new restaurant, and expand services. I mean it's been 11 years now. The public is frustrated. We are frustrated.

Do you get that kind of feedback a lot?

Oh yea, all the time. The masterplan, as you saw, was pretty ambitious. Around the same time the masterplan was introduced, the park services director visited Flamingo and he had to scale the plans back.

Do you think any of that original master plan will be implemented then?

Yea. What went out for bid was what the director said is essential. He was concerned about the level of investment, and the climate change/sea level rise issues of building in a costal area. So he asked us to take a step back and re-analyze what was essential. The compromised goals or bottom line is what went out for bid the first time—after the masterplan. One example of a piece that got cut out from the original masterplan during this time was changes to the marina. It [the masterplan] said to move the building farther back from the water's edge, elevate it, make the building two stories, and put a rooftop restaurant on top. That would be a 4, or 5 million dollar project. It was cut out because we have a functional building, that although may be flooded at some point, is already built and currently operating. Whereas lodging, a restaurant, and other basics that were destroyed by the hurricane should be the project priorities that come first for the public.

Regardless of whoever wins the bid, they will take over those new building projects in addition to taking over the current services of the marina and the boat tours correct?

Yes all that, plus they will take over management of the campgrounds of Flamingo and even the campgrounds of Long Pine Key which are currently overseen by the NPS.

Why is the NPS turning all of those services over the concessioner as additional responsibilities?

The challenges of operating down there pose a lot of risk to a concessioner; flooding, hurricanes, bugs, storms, remoteness. We had to look at how to make a financially viable package that would attract a quality concessioner. Operating a campground is actually a profit setter. There's a demand, a built in market, and not a huge investment. The NPS could certainly do it, but it was done to help get the overall rebuilding process started. We're almost 11 years out—and nothing has been built!

I can see why it is difficult. Yesterday Bob was saying how challenging it is to maintain a facility down there in Flamingo.

Yea, you saw what I'm talking about with Bob. There are so many unknowns that can happen on any given day. Just last week the phones weren't working. So yea, it's all those risk factors and uncertainty that make the challenge. A company can operate at any other National park with a lot less uncertainty than here.

The water and electric all come from local municipalities, even though they are far away?

Yes, it's all connected. You have all the necessary pumps, that if they fail, mess everything up.

So do you think systems that are off the grid could work at Flamingo?

I'm not sure that's possible down there, at least not in the near future. But the good thing about a concessioner is they are going to want more amenities, like WiFi, so they will invest in that. The concessioner, with processing credit cards for a restaurant and lodge, will need a more secure and stable system than what is currently available.

Did the lodging site before have direct access to the water, or bay?

Not completely, but there were many openings or vistas out to the water.

Do you see any trends in the tourist demographics at the Everglades?

The number of international travellers is definitely increasing, and the baby boomer population is pretty big. I'm sure you saw plenty of the more comfortable RV camping for these guys. So I think the ecotents will be pretty popular because they will be a kind of a semi-comfort lodging. The operation of those will be left up to the concessioner. But generally we would want them to come down for hurricanes of course, but you're going to need a lot of man power to put all of those up or take them down. Depending on how the tents are designed and the levels of staff present.

Are the ecotents replacing the cottage style camping from post-Katrina Flamingo?

Yes, in addition the lodge. But the new lodge will be less like a traditional motel as it was in the past. Within the lodge, the buildings will be more of a cabin style. It will be elevated, and the rooms may be organized in four or six-plex style building pods. And one central main building or lodge.

So kind of like the current staff housing? Did those buildings survive Katrina?

Yes, probably a design similar to that. Yes, almost all of the staff housing survived. We lost a couple, but the rest survived because they were mainly all concrete structures.

Bob told me yesterday how many workers once worked and lived over in that area. He even mentioned that workers had there own small bar and sort of gathering space?

Yea there was. In the future, workers will need something like that to improve the social atmosphere. It is already hard to attract and get workers. It is hard to commute-basically an hour. But again, with initiatives to bring youth back to the parks and to natural areas hopefully there will be resurgence in camping and interested young workers.

I was talking with my professor who told me that the use of National Parks by my generation (millennials) is very low. This surprised me, just because as a landscape architecture student I am biased. I didn't realize overall this was the case.

The advent of technology with kids has hindered the National Parks in some ways. More modern activities that attract many young travellers would never get approved in a National Park Setting.

My whole project is ecotourism. What is ecotourism in the U.S.? Do you think ecotourism is applicable to the Everglades and Flamingo? Do you think a true ecolodge could function here? Would people be attracted to that over traditional types of lodging at Flamingo?

Oh yea, I think very much so. That doesn't really exist anywhere else around here. The chance to stay in a park, an hour from any developed area is.....well you can't find that anywhere else. The pace of development is insane all over south Florida. They [developers] are looking at every square inch of space as buildable land.

That's another battle with this project. The whole idea of ecotourism is to respect and not alter nature. But how do you do this and still meet the challenges that Flamingo is facing to provide lodging for the public?

That has been discussed quite a bit. We questioned whether the lodge and restaurants should be rebuilt at all. Should we remove the infrastructure and just let nature take back over? But the consensus was, because this is really the only place in the park where people can stay overnight without camping gear, the lodge option should come back. It appeals to a wide range of visitors, different age groups, varying levels of mobility, and different skill levels. The lodge should however have a smaller footprint and be designed with more awareness with how to reduce the different environmental impacts. If people are staying there overnight in a lodge, there are many other benefits as well. They are investing in the local restaurant, they aren't burning fossil fuels to drive back and forth everyday, and they are receiving a more meaningful experience.

Has Flamingo ever had any kind of bus or shuttle? Or have they ever considered it?

We have talked about it in the planning process. It likely may become reality, at least seasonally. But likely not until after a lodge is built.

Is there a local airport in Florida City?

No, most people fly into Miami or Fort Lauderdale. So yeah, say someone was staying at the park for a week. What if they just hopped on a shuttle at the airport or a metro and then take a bus from the park entry to Flamingo. Then they wouldn't have to rent a car at all.

I would guess that would be attractive for travellers, especially international travellers?

Oh yes. It could work to run a few buses a day, but that will all have to be determined by economics.. It could be a day loop, back to Miami, or back to Fort Lauderdale. It will all be explored I think, in due time though.

That makes sense. How long have you been with the park?

Fifteen years, since 2001.

How long did it take for Flamingo to come back, or be functional again after Hurricane Katrina in 2005?

It took definitely a few years. Not completely closed off, but back to 'normal'. That first whole year was cleanup. Getting all the electric to work again was a struggle. And all of the layers of mud that had washed up onto the parking lot and around the marina was a huge mess.

What did you do with all of the mud or wash up?

They actually piled up all of the mud from that and from the dredging of the Marina over in the area where you saw the ecotent platform. It was later used to re-grade areas around the site. Everything we did carefully considered the original developed footprint, and how we can reduce that. Like eventually C Loop will probably go away, and the cottage area is certainly going back to native. There's kind of two schools of thought: some people think let's get a concessioner and see how much the lodge gets used and keep the space for expansions, while others think we should shrink the footprint as much as possible now.

What do you think the lodging will be like? Very minimal in design style and materiality and extremely affordable? Or do you think the concessioner will charge a little bit more in order to invest more in higher-end materials and adding amenities like a pool, or hot tubs or large common spaces?

I would say more simple. There's not going to be a pool. That's not appropriate exactly, and ecologically not smart. If visitors want a pool, they will stay in Miami or the Keys. The public said to us, "we want clean, comfortable, basic lodging. We don't need a five-star resort." Not that it will be cheap to stay at Flamingo just because what it takes to operate there. The price will depend on a market analysis considering all the different types of lodging in the area; Miami, Florida City, Key Largo, etc. So the idea is to create a variety of options and prices for lodging at Flamingo. The lodge will need to be well-designed, sustainable, hurricane and sea-level rise resilient. There are a lot of factors down there.

Are you glad you picked what you did?

Yes, it is certainly complex. I am not an architect though so it won't be about designing the building. The thing about this project is that you guys [the NPS] already have so many goals or expectations set already. So my work may be more of a spinoff. It might not all be exactly realistic, because I am still coming at it from an ecotourism perspective.

No I think if you come up with some good ideas potentially that would be available to a future concessioner.

That would be great. And my work will likely be less like precise drawings or a realistic masterplan. It could explore a different avenue, like maybe exploring the transportation issue. I'm not entirely sure yet.

Yes, and we've also explored expanding bike trails and linkages through the park and through Flamingo. It is something we are encouraging. If bikes were available it could be simply added into the lodging fee. All of that has been written into the planning long scale master plan that I helped with. More services and chances to expand facilities will be an option for the concessioner if it is something they will be willing to pursue. Transportation options will be something that can enhance the place; once the concessioner knows how heavily the area is being used.

That would certainly make Flamingo more eco-friendly!

[Conversation winds down and I thank Mr. Herling for spending his morning with me.]

