My internship with the Okefenokee National Wildlife Refuge focused on providing assistance to the Public Use department through the creation of and participation in environmental education and interpretive programs, creation of a summer camp for local children, and revision of existing publications. I was also involved in providing assistance to the Biology and Fire departments in selective projects including endangered species management and prescribed burning. My contribution to ONWR will help them further their progress in establishing a formal environmental education program and also support their ongoing management activities.
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CHAPTER I

INTRODUCTION

The Institute of Environmental Sciences (IES) requires the fulfillment of a research requirement as a part of the Master of Environmental Science degree program. The candidate can choose any one of three options that would fulfill the research requirement including an internship, a thesis or a practicum. I chose the internship option as I have always been interested in working in the real world through application of skills I have learned throughout my years of schooling.

My search for an internship led me to apply for a public use internship with the Okefenokee National Wildlife Refuge (ONWR) that falls under the jurisdiction of the United States Fish and Wildlife Service (USFWS). My application was reviewed and I was accepted for a six month internship with the ONWR. My duties as an intern focused around their public use program and also included working with the biology and fire programs on selective projects. This internship was extremely valuable to me as my interests have always revolved around studying and working in an interdisciplinary field. Working with ONWR helped me contribute to projects in education, endangered species management and prescribed burning, among others.
CHAPTER II
THE OKEFENOKEE NATIONAL WILDLIFE REFUGE

Location

Figure 1. Detailed Map of the Okefenokee Swamp
The Okefenokee National Wildlife Refuge (ONWR) is located in the southeastern Georgia counties of Ware, Charlton, and Clinch and northeastern Florida’s Baker County (ONWR 2003b). It was established by Executive Order in 1937 to protect the Okefenokee Swamp that is located on the Georgia-Florida border about 60 miles from the Georgia Coast (Schoettle 2002). The refuge currently encompasses around 396,000 acres of which 353,000 acres are designated as National Wilderness Area (ONWR 2003a).

The Okefenokee Swamp is well networked with the system of swamps and pinelands found in the southeastern coastal plain. It is also the “headwaters of both the Suwannee and St. Mary’s Rivers, which drain the swamp” (Schoettle 2002). There are three main entrances and two secondary entrances to access the Okefenokee Swamp. The main entrances include the North Entrance (Okefenokee Swamp Park), near Waycross, the East Entrance (Suwannee canal Recreation Area and the main entrance to ONWR), near Folkston, and the West Entrance (Stephen C. Foster State Park), near Fargo (figure 1) (Schoettle 2002). The two secondary entrances include the North East Entrance (Kingfisher Landing), just south of the little hamlet of Racepond, and the Suwannee River Sill, which is also found near Fargo (figure 1) (Schoettle 2002).

Physical Environment

“The Okefenokee Swamp is a vast peat bog filling a huge saucer shaped sandy depression that was perhaps once part of the ocean floor” and ranges in elevation from 103-128 feet above sea-level (ONWR 2003b). The name “Okefenokee” is derived from an Indian word meaning “Land of the Trembling Earth” attributed to the deposits of peat that cover the swamp floor causing it to be unstable and tremble (USFWS 2003).

The Okefenokee Swamp is an example of a “Depression Blackwater Swamp” that can be found in the coastal plain rivers in Georgia and is characterized by slow-moving waters that are tea-colored, due to tannic acid from the decaying vegetation, elevated acid levels, lower nutrient levels, and low productivity and species diversity (Schoettle 2002). The principal outlet of the swamp is the Suwannee River that originates in the heart of the Okefenokee and drains southwest into the Gulf of Mexico. The swamp’s southeastern drainage to the Atlantic Ocean is the St. Mary’s River, which forms the boundary between Georgia and Florida.

The swamp encompasses a multitude of habitats and terrains (figure 2, 3). Fifty seven percent of the swamp constitutes swamp forests (western half of the swamp), twenty nine percent is covered by shrub thickets, eight percent constitutes prairies (eastern half of the swamp), six percent of the swamp is occupied by sandy islands (possessing similar pine flatwood ecosystems as found in the uplands surrounding the swamp), and less than one percent of the swamp includes the sixty lakes large enough to be identified by name and other numerous smaller lakes (Schoettle 2002).
Consistent with the climate in similar latitudes including North Africa and the southern Mediterranean Coast, the Okefenokee Swamp has a decided tendency towards
drought (Schoettle 2002). Given the physical environment of the swamp, and the lack of water, strong conditions for fire are created, which essentially oxidizes the organic matter and releases nutrients into the soil (Schoettle 2002). There have been several fires in the swamp caused due to drought in 1927, 1931, and 1932 leading to extensive blackening of the swamp (Schoettle 2002). Despite its negative effects, fire in the Okefenokee Swamp is considered an advantage and in the absence of natural fires, prescribed burns are considered essential to maintain the ecological integrity of the swamp.

Wildlife

The Okefenokee Swamp with its mosaic of habitats is home to diverse wildlife, which includes the American Alligator, Black Bears, Bobcats, a variety of shore and water birds including the endangered Red Cockaded Woodpecker, and an impressive range of frogs and snakes (figure 4,5) (Folkerts 2002). The swamp has been witness to natural and artificial changes over the years that had a tremendous impact on the diversity of its wildlife. The Ivory Billed Woodpecker is now considered to be extinct around the swamp area and the Panther that once roamed freely and widely around the swamp is rarely sighted (Folkerts 2002).

Figure 4. American Alligator (Alligator mississippiensis)
Human History

Human history in the Okefenokee Swamp has been rich and varied in culture and livelihood. The earliest occupation of the swamp dates back to 500-800 AD, by a large Native American population (Schoettle 2002). Evidence of their colonization of the swamp can be observed today through the existing ceremonial burial grounds and findings of pottery shards discovered along the edges of the islands in the swamp.

The danger of Native American raids slowly decreased by the 1800s and led to the full fledged arrival of white settlers within the Okefenokee Swamp (Schoettle 2002). The settlers, or “Swampers” as they were called, made the swamp their home and derived their sustenance through hunting, fishing, trapping, and cultivation in the swamp. Apart from these Swampers, the Okefenokee Swamp was considered to be worthless and was sold to the Suwannee Canal Company in 1891, to be drained and used for logging (Schoettle 2002). This marked the advent of forty years of intense logging of the swamp by the Suwannee Canal Company and the Hebard Cypress Company that purchased the swamp from the Suwannee Canal Company in 1901 (Schoettle 2002). The logging of the swamp had disastrous effects on the ecology of the swamp. Prior to this, the swamp had extensive forests of large cypress, and longleaf pine, which were almost all cleared out by the logging companies (Schoettle 2002). It was not until 1937 the Hebard Cypress Company, perceiving a lack of resources, sold its holdings of the swamp back to the U.S. Government.
Overall Purposes and Objectives of ONWR

Okefenokee National Wildlife Refuge (ONWR) was created to protect the Okefenokee Swamp and acts as a steward to ensure ecological integrity of the swamp through preserving and managing the various cultural and ecological processes within the swamp.

The purpose and significance behind ONWR can be observed from a world-wide perspective to that of the local community. The swamp is one of the largest intact freshwater ecosystems in the world (ONWR 2003a), allowing a multitude of research possibilities. The varying habitats of ONWR are also home to many threatened and endangered species including the Red Cockaded Woodpecker and the Indigo Snake. Besides ecological significance, the refuge has cultural and economic implications as well. The culture of Southeast Georgia has been shaped by the Okefenokee Swamp. The neighboring counties depend on the refuge for the income brought in by tourism (ONWR 2003a).

ONWR preserves the unique qualities of the Okefenokee Swamp for future generations to enjoy (ONWR 2003a). It is essential that areas similar to the Okefenokee Swamp be preserved and managed not only for human benefits, but also for wildlife species protection and survival.

Organizational Structure

ONWR is involved in a wide variety of management issues including public and resource management. There are six main divisions within the ONWR organization. The highest is that of the Management staff, with a Refuge Manager as the head. The other divisions include Administrative Staff, Law Enforcement Staff, Forestry/Fire Staff, Biology Staff, and Visitor Services/Public Use Staff. A copy of the organizational chart for ONWR with the existing employees can be found in appendix A.

My internship is under the Visitor Services/Public Use Division. It is headed by a Supervisory Refuge Ranger and has Refuge Rangers, a Volunteer Coordinator, and Maintenance Workers working within the division. The Visitor Services Staff deal with all aspects of public use and visitation within the refuge, including education, interpretation, and other visitor services.

Purpose and Objective of Visitor Services/Public Use

For purposes of this paper, I will refer to Visitor Services/Public Use Division as Public Use. There has been a growing need within the Refuge System to help educate the public on the importance of setting aside areas for wildlife and habitat preservation. Public Use within a refuge is the division that deals with the visiting public and residents of the surrounding area. They have the role of informing and educating the public on the
needs and problems affecting wildlife and to promote a sense of responsibility for conservation and improvement of wildlife habitat (ONWR 2001).

Other objectives of Public Use include providing the public high quality, safe, interpretive, recreational programs and festivals (ONWR 2001). They also have to ensure the availability of facilities that are compatible with the refuge’s wilderness principles. Public Use deals with all aspects of visitor services within the refuge, including hunting, fishing regulations, dealing with concessions and maintenance. The division is imperative, especially for a refuge like ONWR, which is one of the largest refuges east of the Mississippi and boasts a visitation of over 400,000 people every year (ONWR 2003a).
CHAPTER III

INTERNSHIP DUTIES AND RESPONSIBILITIES

Description of Work

My internship duties focused around ONWR’s Public Use program and my title within the organization was “Public Use Assistant”. I worked closely with the public use staff to carry out a variety of projects that were proposed by my supervisor. I was also allowed to explore opportunities with the biology and forestry/fire departments in the refuge. My duties ranged from teaching environmental education programs to assisting the biologist with Red Cockaded Woodpecker studies.

Public Use

A greater part of my internship duties was within the wide realm of public use. It was an enthralling experience, as it held all the elements that were of great interest to me, including managing resources and working with the public. My duties in this department were not restricted to one area. I was involved in projects that helped me explore the diverse facets of public use. They are as follows:

Creation of Environmental Education Guide for Grades K through 9

The concept of disseminating environmental education is a relatively new concept in the National Wildlife Refuge System. ONWR is in its initial phases of planning and organizing a structured environmental education guide that will help them with visiting school groups. A core part of my duties included assisting a Refuge Ranger in preparing a section of this environmental education guide. My role specifically focused on preparing environmental education programs for grades 4-9, incorporating the local “Quality Core Curriculum” (QCC) Standards, and identifying pre and post activities for each program that will help supplement their educational experience.

The first step in creating these programs was to review existing relevant literature, including education guides from other national refuges and national parks to obtain working concepts to make an outline. Once I formulated an outline, I began to identify programs of interest from available environmental education books and guides that could be incorporated into the guide and modified the programs to suit the refuge needs. A basic outline for every program included in the guide is as follows –

- Title Page
- Objective of educational program.
- Relevancy of program to existing Quality Core Curriculum (QCC) standards.
- Important concepts relevant to the program.
- List of pre-activities suggested to the teacher for his/her class before participating in the on-site activity at the refuge (copies of the activities are included).
- Explanation of the on-site activity (copies of the activities are included).
- List of post-activities suggested to the teacher for his/her class after participating in the on-site activity at the refuge to reiterate concepts learned in the on-site activity (copies of the activities are included).
- Feedback form from teacher.

I created four programs for grades 4-9, using the outline highlighted above. These programs were as follows—

1. *How Many Bears Can Live In The Swamp*: This program was adapted from the education guide “Project Wild K-12 Activity Guide” and modified for grades 4-6 (WREEC and WAFWAb 1996). It will help students define a major component of habitat and understand and identify the concept of limiting factors. A copy of the outline of this program, excluding the actual activities, can be found in appendix B.

2. *Dragonfly Pond*: This program was adapted from the education guide “Project Wild Aquatic Education Activity Guide” and modified for grades 7-9 (WREEC and WAFWAa 1995). It will help students understand the concept of land use and how their lifestyle affects wetlands.

3. *Swamp Succession*: This program was adapted from the “Pond Succession” activity found in the education guide “Project Wild K-12 Activity Guide” and modified for grades 7-9 (WREEC and WAFWAb 1996). It will help students understand the concept of succession and allow them to study changes over time.

4. *Lets Make a Food Web*: This program was adapted from a similar program developed by Donald Kaufman (Miami University), and Cecilia Franz and modified for grades 4-9. It will help students understand and represent the movement of energy across different trophic levels and for the ecosystem as a whole.

A major factor taken into consideration while developing these programs was to ensure their relevancy with any one of six themes identified by the refuge for educational purposes. These included Animal Communities, Wetland Ecology, Habitats, Fire Ecology, Cultural History, and Conservation Principles.

In addition to formulating the environmental education programs the guide required a preliminary packet that was essential to let local schools know the existence and relevance of the programs available in ONWR. Various school groups come to ONWR for field visits, and it was deemed important to provide them with background information before their visit. This resulted in my creation of an introductory packet (based on literature reviews) to send to the school group interested in visiting the refuge. A copy of the introductory packet can be found in appendix C. The introductory packet includes:

- A letter inviting the teacher and providing information on the program
- Field trip logistics
- Background information on ONWR

The environmental education guide that I have helped create is still under revision. ONWR will utilize the format I have created to format similar programs in the future.
Summer Camps

Along with the process of establishing a formal environmental education program, ONWR was also interested in the creation of a summer camp format which could be used in the future. I was assigned the responsibility of creating and conducting a summer camp program for the local children in Folkston, GA. Another similar project I was involved in was organizing a one day specialized summer camp program with programs centered around hands-on ecological training for the Mecklenburg County Parks and Recreation Department which was bringing a group of children between the ages of 10-12 to ONWR as part of a camp they were holding in their County. This process was very constructive for me as it taught me how to organize programs on a large scale basis. Events like a summer camp require detailed planning and organizing and constant networking. These skills were reinforced for me during the course of creating a summer camp for ONWR.

Junior Ranger Summer Camp

After consultation with my supervisor, the camp for ONWR was scheduled as a three day program for children between the ages of 10-12. The next step was to create a framework for the three days centering on themes that would provide the structure for selection of suitable activities. I decided to focus on selecting one theme per day resulting in the selection of three themes for the three days of camp. The themes that were selected were as follows -

- Day One - Wetland Ecology
- Day Two - Cultural History
- Day Three - Refuge Management Issues

Once the themes were finalized, I started working on identifying activities that would relate to the themes. This involved review of existing literature, including summer camps held by the National Park System and various books on activities for children. The activities I selected include a scavenger hunt using a compass, studying water chemistry, learning the art of pottery, and making palmetto fans. Once activities were finalized, I set up a time frame to determine the feasibility of activities and determined other logistics, including materials and staffing for the activities. This was an extensive process and underwent several revisions based on the logistics mentioned above. I was also constantly networking with my supervisor and other rangers to ensure that the camp was fulfilling ONWR standards and requirements. Please refer to appendix D for a detailed schedule of activities and the time frame.

The next phase in planning the camp involved a process of merging the summer camp with the Junior Ranger program that already existed within the National Park Service and the National Wildlife Refuge System. The underlying objectives of the ranger program are to inspire children to learn more about their natural resources and help educate and motivate them to become more active participants in the processes of conservation and management of natural resources. By merging the camp with the Junior Ranger program, we are providing a more comprehensive educational experience for the children. The participants at the end of the three day camp will be rewarded with a Junior Ranger certificate and button in recognition of their involvement and completion of the Junior Ranger Summer Camp.
This phase of preparation for the camp also dealt with advertising in the local elementary school, organizing and assembling materials for the various activities, scheduling staff and volunteers, registration of participants, producing an introductory packet for the parents, finalizing a nature journal for the children, and determining prizes and other gifts. The introductory packet that was created included a three day schedule for the camp, rules and regulations, a map of the area where the camp would be held within the refuge, and a pre-camp activity for the children that would help them get into the mindset of starting camp. This activity was designed by me as well, and was based on navigation and orientation skills (appendix E). I assembled the nature journal for the participants based on existing activity guides including the Junior Ranger Activity Guide. A copy of the journal will be presented at my defense hearing.

The days leading to the camp were spent finalizing schedules, activities, and prizes. As mentioned earlier, a scavenger hunt had been planned as one of the activities for the camp where the children would be taught to use a compass, which will help them find the clues for the Scavenger Hunt. In order to finalize the clues for the hunt, a trial hunt was organized for the instructors to ensure relative accuracy of clues. This was conducted with a high degree of success and was useful for the instructors, as it helped prepare them for the actual event.

The ONWR Junior Ranger Summer Camp was held on June 16-18, 2003. The three days of camp went by without any major difficulties. All activities were conducted well and the evaluations from the participants, parents and instructors were that the camp had been organized efficiently. The camp was followed by a review meeting with the associated instructors and the refuge manager, where it was determined that the camp had been extremely successful and was identified as a program that should be repeated in the following years. A copy of the evaluation forms and the summarized assessment can be found in appendix F. Pictures from the junior ranger summer camp can be found in plates 1 through 8 (pages 20 and 21).

Ecology Summer Camp

The Mecklenburg County Parks and Recreation Department were scheduled to bring in two groups of children on June 24, 2003 and July 15, 2003 respectively. They were conducting a summer camp and had scheduled a trip to the Okefenokee National Wildlife Refuge as part of their camp activities. Their request for the scheduled day trip was for the refuge to set up activities that were ecological and hands on in nature.

After some deliberation, the schedule I set up for Mecklenburg County included a boat ride around the swamp, exploring pond life, and learning about the importance of forestry. The pond life activity was taught by a retired teacher who has always helped with programs in ONWR, and the forestry program was conducted by an educational instructor from the Georgia Forestry Commission. All activities proved to be successful and the group enjoyed their visit to the refuge. As my internship ends on July 6, 2003, and I will not be available to lead the second group from Mecklenburg County, I have arranged for similar activities to be held that day and handed over the responsibility to a Refuge Ranger in ONWR.
Plate 1. Group Picture of Participants and Instructors for Camp.

Plate 2. Participants looking through a “peeper”.

Plate 3. Participants making a Roll Up Travel Journal.

Plate 4. Participants looking at “Pond Life”.

Plate 1. Group Picture of Participants and Instructors for Camp.
Plate 5. Participants holding up their Pottery pieces.

Plate 6. Scavenger Hunt participants.

Plate 7. Creating Animal track moulds.

Plate 8. Participants playing the Endangered Species game.
Revision of Publications

Publications form an integral part of any National Wildlife refuge. It is one of the most successful means of spreading information to the general public. There was a request to revise and update the publications in ONWR, which turned into one of the responsibilities in my internship. The publications I revised include:

- the general refuge brochure
- a brochure on overnight canoe trips in the Okefenokee swamp that is offered by the refuge
- a tear off sheet containing information on the walking trails in the refuge.

Revising these brochures is a tedious process and requires following FWS Standards that exist for creating publications, formulating a cost estimate for proposed changes and a review of existing information and images to update the brochures.

My first step was to identify what changes could be made to the relevant brochures. This required a process of deliberation with the biologist who would be responsible for creating the revised maps for the publications. Once this was finalized, I conferred with the Chief of Publications in the USFWS regional office in Atlanta to get cost estimates on and feasibility of proposed changes based on color, number of pages, etc. Based on the information gathered, I made a presentation to the Public Use Staff for their review. On examining the revisions, they recommended the preparation of a cost estimate for all brochures to see if the refuge would encounter additional expenses or savings. This was formulated based on existing refuge costs for publications obtained from the Administrative officer in ONWR and information on potential costs obtained from the Chief of Publications in Atlanta. A copy of my cost estimate for the refuge can be found in appendix G. This cost estimate will be presented to management in the near future by the public use staff to aid in their consent for the proposed changes.

The next step was to prepare a layout for the revisions in the publications. I was able to design a layout for the general brochure and the tear sheet. This was also reviewed by the public use staff and deemed to be suitable. Due to time constraints, the extent of revisions was limited to the cost estimate, formulation of layouts for the general brochure and time sheet. Tentative maps for the general and canoe brochures have been prepared by the biologist at ONWR. These are still subject to review. To aid the public use staff on my departure, I have prepared a document accentuating and listing the various brochures and their proposed revisions and any instructions necessary to complete the changes. This should provide adequate background for the next person who will continue with this project.

Environmental Education Programs

An appealing part of my internship was conducting environmental education programs for various school groups. This allowed me to examine the extent of my knowledge in the various concepts I was helping impart and helped me participate in the shared responsibility of educating the wider audience outside the refuge.
Program on Bird Food Habits

This program involved educating pre-kindergarten children on the varying food habits of birds and how their beaks evolve depending on the habitat they feed in, the kind of food they eat, etc. The program started by providing the children with a brief introduction on birds and their eating habits. It was followed by the blowing of edible bubbles, which the children had to catch with their mouths (they were not allowed to use hands), illustrating how birds use their beaks to catch things. The next part of the program provided the children with a variety of spoons, tongs, tweezers, drinking straws, and nutcrackers from which they each had to select one and use it to pick food from a bowl of water with raisins, juice from a glass, and "gummy worms" from a bowl of oatmeal. This was to illustrate how different birds use different kinds of beaks depending on their diet. This was an extremely interesting program and the children enjoyed it to the utmost. It also proved to be very educational as it was a hands-on activity that the children could be involved in.

Plant Bingo Hike (Environmental education program involving a hike)

This program was set up for second grade children. It involved providing the children with bingo sheets comprising of pictures of different plants, birds, and insects in the swamp and taking them in groups of twenty through one of the hiking trails within ONWR for periods of 15-25 minutes (figure 6). Through this activity, I helped the children identify the various species indicated on their sheets during the hike. If a child got four in a line, he or she was awarded a small gift. This program was especially useful to me as it aided me in becoming more aware of the different species of plants, birds, and insects within ONWR and improved my identification skills.

“Swamps Alive”

I assisted the Refuge Ranger in conducting an educational program called “Swamps Alive” for elementary school children. The objective of the program is to teach participants to search for signs of wildlife in the area surrounding them and through this
help them understand that even if they do not encounter an animal or bird directly, there is other evidence that indicates the presence of life around them. The program involves placing items including a turtle shell, deer antlers, owl feathers, and a hornet’s nest throughout the boardwalk in the refuge. The children are allowed to walk the trail and are given worksheets to mark all the animals and birds or signs of animals and birds that they are encouraged to observe. They are encouraged to not only directly observe wildlife, but look for signs that might indicate the presence of an animal or bird. For example, the deer antlers are an indication of a deer and so on. Through this they become more aware of their surroundings. This program helped me become more aware of my surroundings and it was extremely interesting to observe the children look for the signs provided.

Interpretation

During my internship at ONWR, I was allowed to participate in both educational and interpretive programs. The difference between the two is that while educational programs have a definite structure and are oriented towards set groups of people based on age group etc., interpretive programs are less structured, with the interpreter bearing the responsibility of modifying the program based on his/her group dynamics. In interpretive programs, the participants could be of varied ages with different intentions. An interpretive program does not have clearly outlined objectives like an educational program has. An important outcome of interpretive programs is evoking emotions in the audience based on the material in your program, to give them a sense of feeling. Participating in and conducting interpretive programs was extremely beneficial to me as it helped me learn and distinguish between educational and interpretive programs.

Chesser Island Homestead

The Okefenokee Swamp has a long history of human settlement. The earliest known settlers are Native American tribes, followed by people from surrounding counties. The pioneers who lived in this region were called “Swampers”. They either worked for the lumber companies that were present at the time or lived a subsistence life, relying on hunting and crop cultivation on their lands. They even made their own syrup and raised livestock. The Chesser family was one among the many pioneer families that settled in the swamp. William T. Chesser settled in the swamp in 1858 and raised four generations henceforth (Schoettle 2002). His grandson, Tom Chesser, built what is now called the Chesser Island Homestead that has been restored by ONWR once they retained rights to his property (figure 7). This homestead is open to the public to make them aware of the lifestyle of the “Swampers”.
One of my duties as an intern was to help with interpretation of the homestead. This consists of helping visitors understand the history of the homestead and details on their lifestyles. It involved a process of taking the public through the homestead and highlighting details about the Chesser lifestyle, while pointing to various objects and structures. This was extremely interesting as it helped me understand the cultural history of the swamp.

**Owl Prowl**

This is an interpretive program that is open to the public through the months January to May. The program starts approximately one half hour before sunset, and involves taking the participants to the boardwalk that is present within ONWR and making a short presentation on the different species of owls present in the swamp. Information is also provided on the basic anatomy of an owl and its nesting and feeding habits (figure 8). After the presentation, they are taken to a 30-35 foot observation tower at the end of the boardwalk to listen and observe for owls. I took two groups out during the course of my internship. This program was one of my favorites, as not only did it provide me with information on the owls within the refuge, but it also allowed for me to go out during sunset and witness the beauty of the swamp as the day draws to an end.
Annual events such as festivals are central to public use in any National Wildlife Refuge. They aid in providing the public with education and enjoyment simultaneously. Another section of my duties at ONWR was to assist in planning and organizing three central festivals, including Wings Over The Swamp, Earth Day and the Annual Fishing Derby. The extent of celebrations varies based on feasibility of staff, time and other resources. It was extremely interesting for me to be a part of this planning process as it helped me become aware of how agencies like ONWR budget their resources for these key events.

**Wings over the Swamp**

February 8, 2003 is the date for the annual festival Wings Over the Swamp (WOTS) that ONWR celebrates to commemorate the birds of the Okefenokee swamp. This festival focuses primarily on the birds of the swamp and helps educate the public on the same through exhibit displays, craft activities and games for children, raptor shows and a local band that plays songs composed around the Okefenokee Swamp.

This year, the celebration was more low-key and the emphasis was on poster board displays providing information on the woodpeckers in Okefenokee and other birds. There was no raptor show, but there were crafts and games for the locals and their kids to participate in. My role in this event revolved around helping put the crafts and games together. I developed a bingo game based on the birds of Okefenokee that the visitors could play (appendix I). This was a “fun” project for me to be involved in. I also helped others put together other activities for kids, including making owls out of pinecones and paper birds. The event was quite a success and helped educate me further on the birds we can find in the Okefenokee Swamp.
Earth Day

An integral part of the National Wildlife Week Celebration is the Earth Day Festival. This year, the festivities were held on April 19, 2003, and were carried out on a larger scale compared to earlier years. The main event was held on the Swamp Island Drive, which is a nine mile paved loop within the refuge.

Figure 9. Don Barryhill at the Cultural History booth during Earth Day
(Source: ONWR Images)

Figure 10. Fire Management booth on Earth Day

There were various booths highlighting significant aspects including booths on cultural history of the Okefenokee Swamp, habitat and animals, fire and endangered
species management (figures 9,10). There were also fun activities for kids including T-Shirt painting and the “Crane Brain” game.

My role in this festivity was to help coordinate and organize the various events and in creating an activity for kids to learn about animals. On the day of the event, I was stationed in the booth giving out information on the various habitats, plants and animals in ONWR.

The game that I created for ONWR for Earth Day Celebrations is called “Wide World of Animals”. The goal of this activity is to educate the public on the “global variation of animal locations”, by highlighting where their homes are in the world. For example, it will help teach them that Pandas are from China, and Kangaroos are from Australia. This activity consisted of a large map of the world that was set up (I had drawn the map earlier), and the children who visited the booth were given black and white pictures of animals that they could color (figure 11). Once they colored the animals, they were asked to guess which part of the world the animal belongs to. The children then stuck their colored sheets on the map (figure 12). If the child made a mistake, the right location of the animal was pointed out. The whole process of creating and implementing this activity helped hone my existing skills of planning activities.

Figure 11. Children coloring endangered animal pictures (Source: ONWR Images)
Annual Fishing Derby

The Second Annual Youth Fishing Derby and Festival was held at Banks Lake National Wildlife Refuge in May (Banks Lake is a satellite refuge of ONWR). Participants for the Derby were within the age group of three through fifteen and prizes were awarded to the winners. Other festivities included a Kids Casting Clinic and a Casting Competition, T-Shirt Art, Knot tying demonstrations, “Worm Grunting”, and a raffle (figure 13).

I assisted the Park Ranger with setting up exhibits, registration, and other duties. I also helped with other duties on site. The festival was to encourage residents near Banks Lake to visit the refuge on a regular basis. Fishing is an important feature of the local communities and this event was an important tool in promoting the refuge as a popular and user-friendly fishing location.

Figure 13. Kids participating in a contest for the Fishing Derby (Source: ONWR Images)
World Wetlands Day Article

2 February, 2003, marked the sixth consecutive year in celebrating World Wetlands Day. This date commemorates the signing of the Convention on Wetlands, in the Iranian city of Ramsar, on 2 February 1971, which is an intergovernmental treaty promoting international cooperation and national action for the conservation and wise use of wetlands. World Wetlands Day is celebrated by governmental agencies, non-governmental agencies, and other groups of concerned citizens to promote the importance and universal benefits of wetlands.

ONWR did not hold any special celebrations commemorating this day. The only undertaking for this event was a news article that was sent to local newspapers highlighting the importance of World Wetlands Day and the significance of the Okefenokee Swamp. I was asked by a Refuge Ranger to write this article. A copy of my article can be found in appendix J.

Visitor Center Operations

Learning to operate the Visitor Center in the refuge was another duty within my internship. It involved a significant number of hours throughout my internship that I spent helping run the center. The visitor center operations range from greeting visitors, ensuring that all exhibits are functioning properly, and closing the center for the day. It implies a thorough understanding of historical and current information on the refuge. Helping run the visitor center also involves a process of interpretation; i.e., providing the visitor with information about the refuge and helping them experience a connection with the refuge and its significance. I had to conduct an extensive literature review to educate myself on the running of the refuge and its background. This part of my internship has taught me to understand the working and management behind similar centers and has also and will continue to be a truly educational experience through meeting different kinds of people and learning something new from their experiences.

Centennial Celebrations

March 14, 2003 marked the 100th year since Teddy Roosevelt opened the first refuge, Pelican Island in Florida. The refuge system commemorated this day with celebrations in all its refuges. ONWR was involved in the celebrations held in three refuges including Pelican Island Refuge in Florida, Piedmont National Wildlife Refuge in Georgia, and itself. Preparing for these celebrations included representing ONWR in the other two refuges. I was chosen to represent ONWR with another Refuge Ranger at the celebrations in Piedmont National Wildlife Refuge. This process also required selecting exhibits to take to the refuges and writing press releases informing the public of celebrations in ONWR. I was involved in both facets. I helped in setting up existing exhibits of the refuge and creating new exhibits for the rangers to select, and I was also involved in writing a press release for ONWR. This focused on providing the audience
with a background about ONWR and the Centennial celebrations. A copy of the press release can be found in appendix K.

**Piedmont National Wildlife Refuge**

I helped represent ONWR along with another Refuge Ranger at Piedmont National Wildlife Refuge near Juliette, GA. We set up a booth containing exhibits and information on ONWR (figure 14). We also set up a game for the visitors to play where they would have to put their hands inside a covered box and guess the name of the object they were holding. Objects that were placed within the box included a pine cone, a cypress knee, and deer antlers. This was an educational experience for me as I witnessed the workings of a similar refuge. I also met with Rangers and Managers from refuges around Georgia, which helped me in understanding the intricacies of the National Wildlife Refuge System.

![Figure 14. The booth at Piedmont National Wildlife Refuge (Source: ONWR Images)](image)

**Regional Office U.S. Fish and Wildlife Service (USFWS), Atlanta**

Besides the celebrations held during March for the Centennial, the Regional Office of the U.S. Fish and Wildlife Service in Atlanta decided to celebrate it as part of their Career Day festivities. I helped represent the refuge on this occasion with two other rangers. We set up a booth containing exhibits and information on ONWR and also set up an activity called “How to Dress an Alligator” for the visitors to play. For this game, we would dress a consenting participant with different objects that represent different parts of an alligator. For example, we would provide the participant with a pair of goggles that represent the nictitating membrane of the alligator (figure 15).

Representing the refuge has always been an educational experience for me, as I meet new people and learn about other places. This time I got to interact with personnel from the USFWS office and gained insight into how the regional office works.
Maintenance

Maintenance of refuge buildings and structures providing visitor services is central to Public Use. An integral part of their duties is to ensure appropriate cleanliness and accessibility of these structures. They are also responsible for maintaining the wide expanse of canoe and boat trails that is present in the swamp. This is an immense project as it requires continuous monitoring. Volunteers, interns and external contractors play a key role in helping the public use staff sustain these services.

Bank’s Lake Clean Up

A part of ONWR’s jurisdiction is Bank’s Lake that lies north of the refuge. The history of the lake includes an attempt to drain part of the lake to eradicate some of the vegetation that had grown around it. During this process, because of accidental incidents, the lake was drained more than required, resulting in the presence of dead fish and other scrap materials that were present in the lake bottom. Due to this, efforts have been made to clean up the Bank’s Lake area and the surrounding park. I was not involved in the actual clean up of the lake, but was involved in helping clean the park around the lake. This involved outdoor work where I aided in removing leaf debris and fallen branches. This was interesting as I got to learn the history of the lake and was introduced to another part of the refuge, which I had not seen earlier.
Gannet Lake Trail Maintenance

Figure 16. Visitors paddling along a Canoe Trail in the Okefenokee Swamp (Source: ONWR Images)

A major attraction at ONWR is the presence of canoe trails and boat trails for visitors and employees to use (figure 16). This trail system has to be managed appropriately at regular intervals to ensure that the undergrowth and overgrowth do not cover the trails. The trails not only provide visitors with the ability to witness the beauty of the swamp, it also provides employees access to study and protect the swamp. Hence it is imperative that the growth around the trails is cleared frequently to ensure accessibility.

I was allowed to assist in one of the expeditions to clear the trails around an area called Gannet Lake. The trail we were working on was a motorboat trail, and had not been worked on for a long period of time. An important concept to understand here is that as the swamp consists of wilderness area, the use of electrical tools is extremely limited. Hence the only tools we are allowed to use are rakes and loppers for a greater part of the clearing. This makes the process long and tedious.

Figure 17. Boat Trail in the Okefenokee Swamp
It usually takes weeks to finish clearing one trail. The day I went to help, we worked on a specific portion of the trail, cutting away plants and vines to open up the clearing. I was unable to get pictures of the specific trail I worked on, but I have included two pictures that illustrate a similar habitat in figures 17, and 18. This project was one of my best experiences in the swamp for not only did I learn a little about how trails similar to these are managed, but I also got to help them in the process.

Read Aloud

A very interesting and entertaining project that I was involved in during my internship at ONWR is participating in a “Read Aloud” program in a local elementary school in Folkston, GA. This involves going to the school every second Friday of the month and reading stories to children from Pre-K to 2nd grade. My involvement with the Read Aloud included reading stories about animals and the environment to the children. An idea that I discussed with my supervisors and was granted permission for, was to incorporate some environmental education with the story I would read to the children. This included helping them identify various animal sounds and stressing on the importance of the environment. I participated several times in the Read Aloud program during the course of my internship. This provided me with an opportunity to go out into the community and work with the general public.

Training

An extremely valuable experience I attained during my internship at ONWR was the diverse training opportunities that I participated in. All ONWR employees and volunteers are constantly undergoing some kind of training. ONWR highly encourages
participation in various guidance opportunities and promotes the importance of being up
to date in an individual’s respective field of expertise.

Visitor Services Training
A very integral part of my first month in the refuge was the official visitor services
training I underwent in the last week of January. This training is conducted by the
National Conservation Training Center (NCTC) to orient members of the U.S Fish and
Wildlife Service (USFWS) on the handling of visitor services. The training lasted for a
week and covered areas including –

- The Fish and Wildlife Service (FWS) Budget process
- Legislation/Policy/Promises and Appropriate Uses of Wilderness areas
- Wildlife Dependent Public Uses
- Interpretive Process Model and Environmental Education in the FWS
- Overview on Comprehensive Conservation Plans (CCP)
- Visitor Services Planning and Evaluation
- Fee Demonstration Program and Concession Management
- Communications – Signs, Publications, Media
- Volunteers and friends Groups/ Accessibility to refuge

The training concluded with the participants engaging in a mock visitor services
review of the Okefenokee refuge. This consists of evaluating different facets including
the areas mentioned above, and making recommendations for the following 15 years on
improvements that could be carried out by the refuge.

This training was extremely beneficial to me. It introduced me to the extremely vast
world of visitor services. It was very interesting for me to comprehend all the areas that
fall under the broad term visitor services and in the future will help me identify and
narrow my interests. The training was also helpful as I met many individuals in the
public use field within the FWS. I learned immensely from their experiences and
backgrounds. Overall this was a complete educational experience for me.

First Aid Training
All employees and volunteers working for ONWR are required to undergo first
aid training on a yearly basis. This was extremely beneficial to me, as I have never
received formal first aid training prior to working here. The training covered the basics
of CPR and what to do in the case of an emergency. Issues of responses to snake bites,
allergic reactions, and broken bones were covered. This training is of tremendous benefit
for me while working in a wildlife refuge and will help me handle emergency situations
with more ease.

Project Learning Tree Training
Project Learning Tree® (PLT) is an award winning, broad-based environmental
education program for educators and students in PreK - grade 12 (AFF 2003). It brings
materials from the environment for programs on topics including forest, wildlife, water,
and waste management. It is an extremely user friendly educational tool for teachers,
which helps them teach students “how” to think rather than “what” to think (AFF 2003).
Its programs are used to help students become more aware of their surrounding environment and its importance.

ONWR held an educator workshop on PLT that trains teachers to incorporate the PLT activities into their current and future lesson plans. Through attending the workshop, the teachers also become part of a national network that can provide them with follow up resources and other opportunities (AFF 2003). I was given the opportunity to be a participant in the workshop and the experience and resources I attained through this workshop are invaluable. The training consisted of spreading the goals and mission of PLT, participating in activities from the PLT guide and also learning to prepare for and conduct activities from the PLT guide. I am certified by the PLT committee to teach the PLT guide.

Public Use Meetings

The Public Use team at ONWR holds regular meetings to review the work of the personnel involved within the team, including the various facets of education, hunting and fishing, sign maintenance for trails and other parts of the refuge, arranging public events and much more. I was asked to sit in on several of these meetings to acquire a better understanding of what public use personnel are involved in and the current projects they were handling. This was extremely informative as I was brought up to date on their assignments and also received more direction for the public use projects I was involved in. This proved to be very constructive as I received comments from all the personnel involved in the public use program.

Biology

ONWR has a very active biology division that manages and monitors its various ecological processes. Both short term and long term studies are used to maintain data sets that help resource management staff in identifying trends. The refuge is actively involved in bird surveys, red cockaded woodpecker management, maintenance and monitoring of weather stations, recording water levels and working with air monitoring equipment, among many. During my internship period, I assisted the biology staff with red cockaded woodpecker management activities.

Red Cockaded Woodpecker Management

The Red Cockaded Woodpecker (RCW) (*Picoides borealis*) is an endangered species that is managed within ONWR. Figure 19 from the Texas Agricultural Extension
Service shows an image of the RCW as it is flying into its cavity. The refuge has approximately 70 RCW clusters, i.e., a group of trees, which is used by a family group of birds; of which 29 are active (ONWR 2003a).

![Red Cockaded Woodpecker](image)

Figure 19. Red Cockaded Woodpecker (Picoides borealis)

RCW clusters are found both in forested upland areas surrounding the swamp and on interior islands found within the swamp. ONWR uses both natural and artificial cavities to support the RCW population within its jurisdiction (ONWR 2003a). Appendix L shows an older map highlighting the distribution of RCW clusters in the year 2001.

It is believed that before the extensive timber logging, the Okefenokee Swamp had a very healthy population of RCWs; but now with loss of trees and further fragmentation, the RCW population is limited in nesting and interaction opportunities due to its preference to roost and nest in old growth pine forests (ONWR 2003a). Sixty one percent of ONWR’s RCW population now lives in upland islands that are found in what has been proclaimed as part of the “National Wilderness Area” that stress keeping the area as “natural” as possible, limiting the management options within that area (ONWR 2003a). On the other hand, the RCW population found on refuge land on the perimeter of the swamp is managed more efficiently due to better accessibility, habitat conditions and the option of using artificial cavities if required (ONWR 2003a). ONWR supports RCW management with other goals that maximize habitat for the RCW while restoring and maintaining the longleaf-wiregrass ecosystem for all wildlife species, which is native to the area (ONWR 2003a).

**Red Cockaded Woodpecker Cavity Survey**  
An imperative constituent of managing a species like the RCW is to identify areas of existing and potential cavities in trees within refuge lands. This is necessary as the number of “active” cavities will determine the nesting capability of the RCW population within ONWR.
This year a survey was held on the various islands that fall within the refuge jurisdiction. I was allowed to help the biologist and her team during one of their expeditions to an island named “Billy’s Island” (figure 20). The survey involved hiking through the island and looking at suitability of existing cavities and also looking for potential new cavities. To survey an existing or potential cavity, a “peeper” was used to
check suitability of the cavity based on factors including length and width of cavity, and presence of another bird or flying squirrels in the cavity (figure 21). The Flying Squirrel is one of the biggest threats to RCW cavities as it has a tendency to take over existing cavities, minimizing nesting opportunities for RCWs.

As shown in figure 22, existing RCW cavity trees were marked with a white band around the tree trunk. These trees were repainted to ensure visibility for the following years and trees that were identified with new cavities were painted as well. Various factors that were taken into consideration during this survey included extent of damage caused by natural fires on trees with cavities and surrounding trees, and also whether existing cavities had been taken over by other birds or small mammals like the Flying Squirrel.

I found the trip to be extremely educational and interesting. It gave me an opportunity to do some field work and also helped me learn about integral species management issues.

**Red Cockaded Woodpecker Banding**

After working with the biologists to identify suitable nesting cavities for the Red Cockaded Woodpeckers (RCW) I was allowed to assist them on one of their trips to band RCW nestlings (figure 23). The process of banding the young RCWs is extremely interesting and necessary to the refuge for RCW management. It is a form of identification used in surveys and other studies that will help distinguish the birds, based on the cluster and family they belong to.
There is a time period within which the nestlings need to be banded. They cannot be banded very early, as their legs would not be big enough to hold the bands, and beyond a certain time period, the process of banding them will become more difficult. To band the birds, the biologist first used a “peeper” to check if the young were at a suitable age to be banded. After identifying the ones to band, the biologist climbed the tree and removed the birds from the cavity. Distinctively colored bands that pertained to their cluster and family were attached to each foot of the bird (figure 24). This data was recorded for later use and the young were returned to their cavity.
Another important detail that was noted while banding was the identification of similar bands on the parent birds that were flying around the cavity tree. This information will assist biologists in identifying which birds had young and may be used for later studies. I was not allowed to do the actual banding as it requires formal training and permitting, but I assisted with trying to identify bands on the parent birds and in recording information (figure 25).

Red Cockaded Woodpecker Sex Identification

Another important component of RCW management within ONWR is to determine the sex of the RCW fledglings. This also has to be done within a specific time frame when the fledglings have developed distinguishing characteristics.

I accompanied the biologist and a volunteer on one of their field visits and learned how to distinguish between the male and female RCW fledglings. The male fledglings have a bright red patch on the top of their heads, which the female fledglings lack. It is this red patch that recedes into the red cockades on the sides of their head as they turn into adult birds. The procedure for identification was extremely educational for me as I could notice the differences between the nestlings and the fledglings and attain some understanding of the development of the RCWs. My experience at ONWR with the RCWs has provided me with a relatively sound basis for understanding the details behind management of an endangered species.

Bird surveys

Conducting bird surveys are another essential part of management within ONWR. I accompanied the biologist on a field trip to conduct a bird survey near a secondary entrance to the refuge.
To conduct the survey, a boat was taken to five different locations within the area to hear and observe for various kinds of birds within a ten minute time frame (figure 26). The time frame was split up into three intervals – one to three minutes, four to five minutes and six to ten minutes. During each interval, the biologist observed and listened for any sights or sounds that would help him identify the different kinds of birds. The survey was completed between 7am and 10am that day to maintain consistency with the earlier records. Ensuring the use of the same locations and time frame, would help minimize the degree of error in the data set. This field trip assisted me in further understanding a significant portion of a specific kind of resource management within ONWR.

Horse Count in Cumberland Island National Seashore

Cumberland Island National Seashore (CINS) is one of the barrier islands located near St. Mary’s, GA. CINS is 17.5 miles long and totals 36,415 acres of which 16,850 are marsh, mud flats, and tidal creeks. It is well known for its sea turtles, abundant shore birds, dune fields, maritime forest, salt marshes, and historic structures.
CINS holds an annual horse count to record the number of horses on the island. They invite staff and volunteers from other parks and refuges to help with this count. I was allowed to participate in this year's event with individuals from ONWR and other National parks. I stayed for two out of the three days required to conduct the census. The first day included travel to Cumberland Island and a training session in the evening to identify horses based on sex, weight, color, etc. The next morning we were split into groups of twos and threes and given specific routes to follow. The route I was given took me through the varying habitats in the island, including maritime forest, marshes, and the sand dunes (figure 27). I was partnered with a lady who works for a National Park in Kentucky.
During our hike, we witnessed an incredibly peculiar phenomenon. We found a donkey with an adult female mare and a juvenile male horse. The donkey turned out to be the dominant male in the group (figure 28). This was extremely interesting, and when we returned to base camp and informed the biologist of this, he said that there was only one donkey left in the island and he has been known to attach himself to a family of horses. My time at CINS qualifies as one of the best projects I have been involved in during my internship at ONWR. It was both educative and entertaining, and it exposed me to working on a program in an area that differed from where I was working.

Forestry/Fire

Figure 29. Fire in the Okefenokee Swamp (Source: ONWR Images)

Fire is an important part of the Okefenokee ecosystem. The frequency and intensity of natural fires in the swamp have been reduced due to fragmentation and development, resulting in major changes in its upland and wetland habitats (ONWR 2003a). Fire management is an integral part of resource management within ONWR as they have to distinguish between natural fires that will prove to be beneficial to the ecological processes in the swamp and those that are harmful (figure 29). The fire crew also conducts and participates in dormant and growing season prescribed burns to reduce hazard level of existing fuels including the brush type that exists now and to restore fire dependent grassy fuel types that will benefit the environment (ONWR 2003a). An important goal of the fire department is to use the natural and prescribed fires to restore longleaf pine community habitats and habitat diversity. As mentioned earlier, this was lost due to the changes that the swamp has been facing over the years.
Prescribed Burning

Figure 30. Prescribed burning using a drip torch (Source: ONWR Images)

Prescribed Burning /Fire Management forms one of the most crucial activities necessary to keep the refuge alive. The Okefenokee refuge is highly active in using prescribed burning to maintain its diverse ecosystem. Fred Wetzel is the Fire Manager and provided me with valuable input into the system used by the refuge in conducting prescribed burns. I was allowed to spend an entire day with the fire crew during their burning of a section of the west side of the refuge (figure 30). The refuge has leased out the west side to a state park, but the prescribed burning is still done by the fire crew in the Okefenokee refuge. This park is known as Stephen C. Foster Park.

As mentioned earlier, I was assigned to be a part of the fire crew on January 7, 2003. I was not allowed to participate in the actual burning, as I do not possess a red card that qualifies me as an official fire officer. My role consisted of playing the part of the personnel relations’ person in the crew. I was asked to take official pictures of the burning process for their records. I also attained first hand information from the fire manager regarding the background, and history behind burning in the Okefenokee region. It shed light on the science behind conducting such a burn. The crew relies on topographic maps and weather details, including precipitation and wind direction for the day they plan on conducting a burn. This information is attained from mini weather stations they have set up in different parts of the refuge. The fire manager was also interested in using up to date GIS maps for conducting burns. He saw this as a potential project for me to work on, i.e., in helping the refuge create GIS maps for the fire crew, but was not pursued due to time and other limitations.

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Hazardous Materials Management

The management of hazardous and toxic materials is an integral part of ONWR’s administration plan. It is necessary to ensure appropriate methods of storage and disposal of these materials due to the sensitivity of the area being protected. I was allowed to spend a day with the hazardous material coordinator within the refuge to understand his duties. Besides ensuring suitable methods of storage and disposal, “Oil Spill Prevention” is also an essential part of the management strategy. A “Spill, Prevention, Control and Countermeasure Plan” is used to define the steps to be taken in the case of any spill emergency (ONWR 2003c).

Routine tasks for the coordinator included ensuring that all departments within the refuge are kept up to date with existing and new hazardous material policies. He also makes an effort to be aware of all hazardous and toxic materials that are being used within the refuge premises (ONWR 2003c). This is a task of sizeable proportions due to the number of people that work with such materials within the refuge. A “Material Safety Data Sheet” (MSDS) folder is maintained to make certain that only chemicals, which are not harmful to the refuge property are being used. All chemicals required, starting from those used for daily maintenance of buildings, are cleared by the refuge biologist. Besides these responsibilities, the hazardous material coordinator also has to conduct routine checks in buildings to ensure that materials such as oil and fuel are disposed in an acceptable manner. I was allowed to accompany the coordinator on one of these checks to the concession that operates within the refuge. It was a very interesting experience for me and I was keen on working on a few small projects with the hazardous material coordinator, as an addition to my duties at ONWR, but was unable to due to time constraints.
CHAPTER IV

IMPLICATIONS OF INTERNSHIP

The projects I was involved in may seem varied in nature, but they tie in the different aspects behind the working of a National Wildlife Refuge. My internship is geared towards attaining a comprehensive outlook on the conservation and management of one of the largest intact freshwater ecosystems in the world (ONWR 2003a). Through my internship, I was able to understand that though the structure of the refuge is split up into several departments, they all work together to ensure success in their respective programs, for example, the fire and biology departments work closely to ensure habitat protection, and the public use and biology departments work together to establish sound educational programs for the public. The implications of my work can be observed on a smaller personal level and a broader public level.

On a personal level, this internship helped me employ skills that I have learned during the two years of coursework at IES and also helped me develop new skills during the course of my six months at ONWR. The internship allowed me to ascertain the extent of my knowledge in the field of resource management and assisted me in identifying what my areas of interest are in this field.

On a broader level, the educational and interpretive programs that I created for ONWR will further their advance into providing better education for visitors. The creation of the summer camp will help increase visitation of the local community. ONWR is one of the largest refuges on the East side of the Mississippi and revisions in their publications will result in better communication with the public. Any assistance I provided to the biology and forestry staff will only add to the enhancement of the results of the projects. My internship with ONWR has reiterated my interest in tying in management of resources and the general public and has also helped me understand the importance of establishing a connection between the two to ensure successful and sound management practices.
CHAPTER V

CONSISTENCY OF INTERNSHIP WITH AREA OF CONCENTRATION

My area of concentration is in Resource Management. Throughout my coursework in IES I have focused on curriculum that brings in the ‘people’ aspect to resource management. As mentioned earlier, I am extremely interested in tying in people and resources and studying the interactions between them. My internship at ONWR was consistent with transferring the skills I have learnt in IES to the real world.

At ONWR, I dealt with environmental education and interpretation. This allowed me to inform people about resources and their importance. My coursework in policy, law, sustainable perspectives of resource and business and applied anthropology, among others, was extremely helpful here. Through this, I helped them understand management of resources even in their day-to-day lives.

In order to help others understand management of their resources, it was important that I studied them. I worked with the Biologist and the Forestry/Fire staff at ONWR to recognize and become aware of the vast resources in the Okefenokee Swamp and how the refuge manages them. My coursework in regional land use, GIS, and conservation of resources was useful here. The skills I have acquired in IES, including grant writing and problem solving were extremely valuable while working with the different departments. Overall, my concentration proved to be consistent with the diverse nature of projects I dealt with during the course of my internship at ONWR.
CHAPTER VI

EVALUATION OF INTERNSHIP EXPERIENCE

My internship at ONWR provided me with expertise in the field of resource management and public use. It helped me work on my existing skills and also acquire new skills. The principal advantage in my internship was the encouragement from ONWR staff to engage myself in projects that were varied in nature and expertise ranging from creating educational programs to assisting the biology staff in field work.

Through the period of my internship, there was no lack of projects to be involved in. This was carried out in addition to my formal duties; including helping represent ONWR in the centennial celebrations, participating in the Read Aloud and assisting with the horse count in CINS. The diverse nature of my duties seemed overwhelming initially, but over time helped me recognize how they are all tied into the big picture of resource management.

Working with the staff at ONWR helped me understand the importance of communication and networking, especially in an organization like ONWR, which has varied departments with numerous staff members. Meetings of the staff were constant and continuous to ensure adequate flow of information among the concerned individuals. I was required to participate in several of these meetings to update my supervisors on the status of my projects and to present any queries I had on my projects. This proved to be very useful, as it streamlined my process and helped clarify any difficulties I had. Networking was also important, especially for projects like the Junior Ranger Summer Camp where rangers from departments including public use, and biology, and other volunteers worked together.

I have mentioned in my “consistency of internship with area of concentration” section how beneficial the skills I learnt in IES were for this internship. In addition, I would also like to highlight the importance of the interdisciplinary character that is stressed in IES for internships similar to mine in ONWR. I found myself extremely comfortable in moving between projects in different departments, and also combining skills from different departments for individual projects that had been proposed. I was able to establish this comfort level, due to the exposure I received in IES to work with projects of an interdisciplinary nature.

Working with ONWR also helped me become more aware of the limitations faced by similar organizations. The reality of funding, staff and time limitations was very much a part of daily operations in ONWR. Projects and other duties were centered on these limitations and this helped me acquire skills to do the same. My internship also helped me realize the difficulties involved in working for a designated “Wilderness” area. There are specific rules and regulations that need to be followed in similar areas, including restrictions on using power tools in the designated areas. I experienced this when I had to help some volunteers clear a boat trail in a wilderness area. We had to use loppers instead of brush cutters or other power tools to clear the overgrown vegetation that included thorn bushes. This was definitely an “eye-opening” experience for me.

Overall, my internship at ONWR has exceeded my expectations of an appealing internship. A primary factor here was the encouragement of the staff members.
throughout my stay. My supervisors’ principles are that an intern should be exposed to all areas of the refuge to help them grow and understand where they are working. This was exactly what I encountered. They encouraged and motivated me to participate in numerous projects and continuously provided me with options to do so. I thoroughly enjoyed my working atmosphere and was nurtured to grow as an intern through the varying degree of responsibilities bestowed on me. The experience I have acquired at ONWR will stay with me throughout the span of my career and help me further my interests in the field of resource management.
My goal during my search for an internship was to find one that helped me work on my existing skills and also helped acquire new skills in the field of resource management. It was also important that I found an internship that promoted ties between the general public and their natural resources. I found both these factors to be an integral part of my internship experience at ONWR. My work proved to be interesting and challenging and I also managed to contribute to their initial phases of planning for a more structured environmental education curriculum, including the summer camp I helped set up for, which will act as a background structure for similar camps in the following years. I found the internship to balance the skills and knowledge I have acquired through my years of schooling in IES and aid me in transferring them to real world situations, and help me progress one step further in the field of resource management.


## APPENDICES

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APPENDIX A. ONWR ORGANIZATIONAL CHART
Appendix B. Guide to "How Many Bears Can Live in the Swamp"

How many bears can live in the swamp?

Source: Adapted from Project Wild K-12 Activity Guide

Grade: 4-6 (Materials present for Grade 6)
Program Objectives

1. Students will define a major component of habitat
2. Students will identify a limiting factor

Program Correlation with Subjects

1. Science
2. Social Studies
3. Mathematics
4. Physical Education

Skills used in the Program

1. Analysis
2. Computation
3. Discussion
4. Evaluation
5. Generalization
6. Kinesthetic Concept Development
7. Listing
8. Observation
9. Psychomotor Development

Important Concepts

1. Habitat: Each species has specific needs for life, such as shelter and food. These needs are met through the surrounding environment, which forms the habitat.

2. Limiting Factors: These are both man made and natural factors that affect the species’ accessibility to their basic needs including food, water, shelter and space. Examples of limiting factors include disease, predation, pollution, climatic conditions and accidents.

3. Carrying Capacity: Carrying capacity is defined broadly as the number of living things - plants as well as animals that any area of land or water can support at any one time. Different life forms will have different carrying capacities, depending on its habitat requirements.

4. Adaptation: Animals and plants living in the swamp have developed in diverse conditions. Living organisms adapt to these various conditions to increase survivability. These adaptations may be seen in the biological shape/form of the plant or animal or in an animal's behavior.
Pre-Visit Activities for the Classroom

Program 1: What Bear Goes Where
- To identify three species of bears and their habitats
- To generalize that animals are adapted in order to live where they do

Program 2: Bearly Born
- To identify survival needs of Black bears and their offspring

Program 3: Classroom carrying Capacity
- To define carrying capacity
- To give examples of factors which can influence the carrying capacity of an area
On-Site Activity

Program: How Many Bears Can Live In The Forest

Group Size: 30-35

Duration: 20-45 minutes (or longer)

Session: Indoor and Outdoor

Materials: Construction Paper cutouts (5 Colors), Envelopes (one per student), Black Felt Pen, Pencils, One Blindfold
Post-Visit Activities for the Classroom

Program 1: Carrying Capacity

- To formulate and test hypotheses related to wildlife populations and carrying capacity
- To describe the significance of carrying capacity
Program Evaluation

We are glad you had the opportunity to participate in the environmental education program at Okefenokee NWR. We would appreciate your feedback on the program and help us maintain and develop improved curriculum-based programs in the future. Thank you for your input!

Please fill the form and return to Sallie Gentry, Refuge Ranger at Okefenokee NWR, Route 2 Box 3330 Folkston, GA 31537.

Name of School:________________________________________
Address:______________________________________________

Teacher(s) Name(s):____________________________________
Grade level:____________________________________________
Date of Visit:__________________________________________
Did you have everything needed to prepare for the trip? _____yes ______no
What pre-site materials did you use? ________________________

What was the best part of the educational experience? ________________

How relevant was the program from a curriculum standpoint? ________________

How relevant was the program for the age-group? ________________

Suggestions____________________________________________

Thank you for your time!!
APPENDIX C. INTRODUCTORY PACKET FOR ENVIRONMENTAL EDUCATION GUIDE

[Requires USFWS Header]

Dear Teacher:

Thank you for participating in the Okefenokee National Wildlife Refuge curriculum based educational program. The program provides an interdisciplinary learning experience for students integrating the natural resources of the Refuge with Georgia Quality Core Curriculum.

QCC's addressed in this program are as follows:

[List the QCC's relevant to the program being sent to the teachers]

Your Refuge visit will allow the students to become active participants in learning about the natural and cultural history of Okefenokee National Wildlife Refuge. The pre-visit lesson plans provided in the manual can be used to challenge your students' curiosity and guide them to a greater understanding of the on-site instruction. The post-visit lesson plans also included in the manual can be used to reinforce and build upon the refuge experience.

On the day of your scheduled field trip, please send your field trip coordinator to the Visitor Center at the Okefenokee refuge. This manual should answer some of your questions, however, if you have any concerns please express them before the field trip. You may contact Sallie Gentry, Refuge Ranger at (912) 496-7836.

Sincerely,

Sallie Gentry
Refuge Ranger
Field Trip Logistics

Timing and Logistics can make or break a field trip. Before coming to the Okefenokee National Wildlife Refuge (refuge), plan your trip carefully from the time you leave school to the time you return. Make realistic estimates of the time needed to travel to your destination, and provide the bus driver with the proper map and directions.

**Discipline:** Adult leaders are responsible for making sure their group arrives and leaves each station on time. They will also be responsible for making sure their group stays together and follow all guidelines.

**Parking:** Bus Parking is available within the refuge.

**Wildlife/Plants:** All animals and plants on the refuge are protected. Please do not pick plants or feed or harass wildlife.

**Visitor Center:** Please no shouting or horsing around in the Visitor Center. No food or drinks are allowed inside the Visitor Center. Students are allowed on the back patio ONLY when an adult is present.

**Boat Dock area:** No running is allowed in or near the boat dock area. It is especially important to keep the group together here. The students may go inside Okefenokee Adventures as long as they are accompanied by adults.

**Trash:** All trash and recyclables should be disposed of in the proper designated bins. Please ensure trash on tables and ground is disposed properly. Inform Visitor Center or Okefenokee Adventures staff if additional trash bags are needed.

**Bathrooms:** Bathrooms are available upon arrival to the refuge.

**Lunch:** Students may bring their own lunch or you can contact Okefenokee Adventures (912) 496-7156 for prices on prepared lunches for the group. Picnic tables are available for students to eat outdoors on a first come first serve basis. It is also advised to carry adequate water supply for the students and the field trip coordinators.

**What to wear:** Please ensure that all students come equipped with seasonally appropriate clothing and rain gear. Students should wear comfortable walking shoes. Hats are also advised for the students.

**Comfort gear:** Biting insects may be present in warmer months. Students may wish to bring bug spray. Sunscreen is also recommended.

**Swimming:** No swimming or wading is allowed on the refuge.

**Respect for Okefenokee National Wildlife Refuge:** All resources in the Okefenokee should be respected. "Take only pictures, leave only footsteps". Please help keep Okefenokee refuge a special place by protecting our natural resources.

**Electronic Devices:** We would discourage the use of any electronic devices including walkmans, game boys, cell phones, pagers etc. by students during their visit to the refuge. This will only help enhance their experience of the sights and sounds of the refuge.

**For special needs:** Okefenokee refuge encourages students with special needs to participate in programs as much as possible. Please call to discuss any special arrangements and/or program adjustments.
Chaperones and Coordinators

Chaperones/Coordinators are an essential component of any field trip. We expect chaperones/coordinators to be responsible for discipline and participation of students. This will help build the student's enthusiasm and initiative to get involved in the program. They should also encourage the students to ask questions.

Chaperones/Coordinators are also required to bring with them a copy of the schedule for their group. This will prevent delays in organizing the students once they reach the refuge, especially if a guided boat tour has been planned. They should also be aware of the field trip logistics that will be provided. This will help make their trip to Okefenokee National Wildlife Refuge safe, fun and educationally rewarding.

Background Information

Okefenokee National Wildlife Refuge
The Okefenokee National Wildlife refuge was established in 1937 to preserve the rare and beautiful Okefenokee Swamp. The refuge includes close to 396,000 acres (650 square miles) almost 90 percent of which have increased protection as a National Wilderness Area. The swamp which extends 38 miles to the north to south and 25 miles east to west, remains one of the most well preserved freshwater areas in America.
Day One: Wetland Ecology

Schedule of Events --

8:00-8:15am -- Arrival at Refuge / Introduction at Visitor Center
8:15-8:30am -- Visitor Center and Video
8:30-8:50am -- Map/Compass Skills
8:50-10:20am -- Scavenger Hunt (and) Roll-Up Travel Journal + Design a Compass
[Split into 2 groups and Group Rotation every 45 minutes]
10:20-10:45am -- Break
10:45-11:30am -- Pond Life: How many different things can you see?
11:30-11:45am -- Nature Journal Entries
11:45am-12:00 noon -- Debriefing
12:00 noon -- Departure from Refuge
Materials for Day One

Total Tables – 2 Long, 4 Short
Chairs -- 10

1. Arrival Materials:
   • Nature Journal
   • Track Cards
   • Pencils
   • Pads for writing

2. Map/Compass Skills/Scavenger Hunt:
   • Compass
   • Map for Hunt
   • Markers
   • Clues per group
   • Final Gifts – Magnifying Lens

3. Roll Up Nature Journal:
   • Corrugated Cardboard paper (for journal cover and roll cover)
   • Decorative Paper or Plain White Paper
   • Yarn
   • TP Rolls
   • Raffia
   • Tables- 2 Short
   • Table Cloth – 2

4. Break:
   • Snacks
   • Large Mixing Bowl for Trail Mix
   • Snack size zip locks
   • Beverages
   • Coolers for Juice/Water
   • Plastic Cups
   • Napkins
   • Tables- 2 Short

5. Pond Life:
   • Don is bringing stuff (ask if he needs anything!!!)
   • Paper
   • Tables – 2 long, 2 short

6. Nature Journal Entries:
   • Journals
   • Pencils

7. Additional Stuff for the Day
   • Crayons for bark/leaf rubbings
Summer Camp

Day Two: Cultural History

Schedule of Events --

8:00-8:15am -- Arrival at Homestead

8:15-8:40am -- Tour of Homestead

8:40-10:20am -- Animal Track/Plant Hike at Deerstand Trail and Homestead Trail (and) Pottery
  [2 groups and Group Rotation every 50 minutes]

10:20-10:40am -- Break

10.40-11:40am -- Craft time (Log Cabins and Palmetto Fans) and Raking
  [3 groups and Group Rotation every 20 minutes]

11:40-11:50am -- Nature Journal Entries

11:50am-12 noon -- Debriefing

12:00 noon -- Departure from refuge
Materials for Day Two

Total Tables -- 4 long, 2 Short
Total Chairs -- 20-25

1. **Introduction to Homestead:**
   - Booklet on Homestead

2. **Animal Track Hike:**
   - Quickstone Plaster
   - Water
   - Big Zip locks
   - Several cardboard strips (1 inch wide and lengths from 15 to 24 inches)
   - Trowel/Knife/Stick
   - Small Zip locks
   - Paper Clips
   - Copies of Track Guide
   - Paint Brushes
   - Plastic Bottles for Water

3. **Pottery:**
   - Merry is bringing Clay
   - Old T-Shirts
   - Container for Water [5 gallon buckets]
   - Water
   - Old Newspapers
   - Tables -- 2 Long

4. **Break:**
   - Snacks
   - Beverages
   - Tables -- 2 Short

5. **Craft Time and Raking:**
   - Six inch twigs [Log Cabins]
   - Paper Plates or pieces of cardboard [Log Cabins]
   - Indented colored paper [Log Cabins]
   - Glue [Log Cabins]
   - Palmetto Fronds [Palmetto Fans]
   - Knife [Palmetto Fans]
   - Cutters [Palmetto Fans]
   - Rakes
   - 4 Long Table

6. **Nature Journal Entries:**
   - Journals
   - Pencils
Summer Camp

Day Three: Refuge Management Issues

Schedule of Events --

8:00-8:15am -- Arrival at Visitor Center
8:15-9:15am -- Boat Ride
9:25-10:10am -- Water & Air testing (and) Wetland Board
   [2 Groups and Group Rotation ~ every 20 minutes]
10:10-10:35am -- Break
10:35-11:30am -- Endangered Species Activity + RCW
11:30-11:45am -- Nature Journal Entries
11:45am-12 noon -- Debriefing
12:00 noon -- Departure from Refuge
Materials for Day Three

Total Tables – 2 Long, 3 Short
Chairs- 20-25

1. Introduction

2. Endangered Species Activity:
   - Large Sheets of colored construction paper
   - Copies of student pages 338 and 339 from PLT
   - Situation sheet

3. Break:
   - Snacks
   - Beverages
   - 2 Short Tables

4. Water testing for pH and Turbidity:
   - Litmus Paper
   - Different Solutions (tap water, lemon juice, vinegar, baking soda, coke, tea)
   - Small Jars or Cups
   - Tables – 1 Long

5. Wetland Board
   - Board
   - Wetland Story
   - Water
   - Bucket
   - Wetland Box stuff
   - Tables – 1 Short

5. Nature Journal Entries:
   - Journals
   - Pencils

6. Concluding Debriefing:
   - Goody Bags
   - Junior Ranger Certificates
   - Buttons
   - Cake
   - Evaluation forms for Parents, Kids, and Instructors
   - T Shirts
   - Table Cloth –2
   - Tables – 1 Long, 1 Short
**JUNIOR RANGER SUMMER CAMP 2003 STAFF SCHEDULE**

**DAY 1 – WETLAND ECOLOGY (JUNE 16, 2003) [8:00am-12 noon at Visitor Center]**

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<tr>
<th>Time</th>
<th>Gracie</th>
<th>Sallie</th>
<th>Russell</th>
<th>Tara</th>
<th>Roopa</th>
<th>Don</th>
<th>Deborah</th>
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★ Person heading the event

**Detailed Schedule for splitting teams**

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<th>Sallie</th>
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<th>Tara</th>
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## DAY 2 – CULTURAL HISTORY (JUNE 17, 2003) [8:00am-12 noon at Chesser Island Homestead]

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<th>Gracie</th>
<th>Sallie</th>
<th>Russell</th>
<th>Tara</th>
<th>Roopa</th>
<th>Ms. Bernice</th>
<th>Merry</th>
<th>YCC</th>
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<tr>
<td><strong>Arrival at Homestead</strong></td>
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<td><strong>Tour of Homestead</strong></td>
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<td><strong>Animal /Plant Hike</strong></td>
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★ Person heading the event

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### Detailed Schedule for splitting teams --

<table>
<thead>
<tr>
<th>Time</th>
<th>Gracie</th>
<th>Sallie</th>
<th>Russell</th>
<th>Tara</th>
<th>Roopa</th>
<th>Ms. Bernice</th>
<th>Merry</th>
<th>YCC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Animal /Plant Hike</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Team A</td>
<td>8:40-9:30am</td>
<td>8:40-9:30am</td>
<td>8:40-9:30am</td>
<td></td>
<td>8:40-9:30am</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Team B</td>
<td>9:30-10:20am</td>
<td>9:30-10:20am</td>
<td>9:30-10:20am</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pottery</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Team A</td>
<td></td>
<td></td>
<td>9:30-10:20am</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Team B</td>
<td></td>
<td></td>
<td>8:40-9:30am</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

★ Log Cabins (Roopa) ★ Palmetto Fans (Sallie) ★ Raking (Gracie)

<table>
<thead>
<tr>
<th>Time</th>
<th>Team A</th>
<th>Team B</th>
<th>Team C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Log Cabins</strong></td>
<td>10:40-11:00am</td>
<td>11:20-11:40am</td>
<td>11:00-11:20am</td>
</tr>
<tr>
<td><strong>Palmetto Fans</strong></td>
<td>11:00-11:20am</td>
<td>10:40-11:00am</td>
<td>11:20-11:40am</td>
</tr>
<tr>
<td><strong>Raking</strong></td>
<td></td>
<td></td>
<td>10:40-11:00am</td>
</tr>
</tbody>
</table>
### DAY 3 – REFUGE MANAGEMENT ISSUES (JUNE 18, 2003) [8:00am-12 noon at Visitor Center]

<table>
<thead>
<tr>
<th></th>
<th>Gracie</th>
<th>Sarah</th>
<th>Roopa</th>
<th>Linda</th>
<th>Tara</th>
<th>Chip</th>
<th>Howard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arrival at VC</td>
<td>8:00-8:15am</td>
<td>8:00-8:15am</td>
<td>8:00-8:15am</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boat Ride</td>
<td></td>
<td></td>
<td>8:15-9:15 am</td>
<td>8:15-9:15 am</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water Testing</td>
<td>9:25-10:10am</td>
<td></td>
<td>9:25-10:10am</td>
<td>9:25-10:10am</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wetland Management</td>
<td>9:25-10:10am</td>
<td></td>
<td></td>
<td>9:25-10:10am</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Break</td>
<td>10:10-10:35am</td>
<td>10:10-10:35am</td>
<td>10:10-10:35am</td>
<td>10:10-10:35am</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Endangered Species</td>
<td>10:35-11:30am</td>
<td>10:35-11:30am</td>
<td>10:35-11:30am</td>
<td>10:35-11:30am</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Journal Entries</td>
<td></td>
<td></td>
<td></td>
<td>11:30-11:45am</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Debriefing</td>
<td>11:45am-12:00 noon</td>
<td>11:45am-12:00 noon</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Celebrations</td>
<td>12 noon onwards...</td>
<td>12 noon onwards...</td>
<td>12 noon onwards...</td>
<td>12 noon onwards...</td>
<td>12 noon onwards...</td>
<td>12 noon onwards...</td>
<td></td>
</tr>
</tbody>
</table>

★ Person heading the event

**Detailed Schedule for splitting teams** –

<table>
<thead>
<tr>
<th></th>
<th>Gracie</th>
<th>Sarah</th>
<th>Roopa</th>
<th>Linda</th>
<th>Tara</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Testing</td>
<td>Team A</td>
<td></td>
<td>9:25-9:50am</td>
<td></td>
<td>9:25-9:50am</td>
</tr>
<tr>
<td></td>
<td>Team B</td>
<td></td>
<td>★ 9:50-10:10am</td>
<td></td>
<td>9:50-10:10am</td>
</tr>
<tr>
<td>Wetland Management</td>
<td>Team A</td>
<td></td>
<td>9:50-10:10am</td>
<td>★ 9:50-10:10am</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Team B</td>
<td></td>
<td>9:25-9:50am</td>
<td></td>
<td>9:25-9:50am</td>
</tr>
</tbody>
</table>
The Piney Woods Path...

Follow the directions provided below to find your way through the magical world of the long leaf pine forest in Okefenokee National Wildlife Refuge. Connect the trees with the directions to find a path to the visitor center. Bring your completed puzzle on the first day of the camp and get an exciting prize. The directions are as follows:

Step 1: Go South from "Start" Tree (this step is completed to give you an example)  
Step 2: Go East  
Step 3: Go South  
Step 4: Go West  
Step 5: Go South  
Step 6: Go East  
Step 7: Go South to finish
We are glad your child had the opportunity to participate in the Junior Refuge Manager Summer Camp program (June 16-18, 2003) at Okefenokee NWR. We would appreciate your feedback on the program and help us maintain and develop improved programs in the future. Thank you for your input!

Please fill the form and return to Roopa Kamesh, Camp Leader at Okefenokee NWR, Route 2 Box 3330 Folkston, GA 31537.

Name of Child: ____________________________
Name of Parent: ___________________________
Grade level of Child: ____________ Child’s School ____________________________________________

Were you provided with adequate directions to prepare for the trip? _______yes _______no

If No, what would you suggest______________________________________________________________

What was the best part of the camp experience for your child? _______________________________

How relevant was the camp for your child’s age-group? ______________________________________

What other activities would you like to see in future camps? _________________________________

Any other suggestions or comments _______________________________________________________

Thank you for your time!!
Summer Camp Evaluation for Participants

We are glad you had the opportunity to participate in the Junior Refuge Manager Summer Camp program (June 16-18, 2003) at Okefenokee NWR. We would appreciate your feedback on the program and help us maintain and develop improved programs in the future. Thank you for your input!

Please fill the form and return to Roopa Kamesh, Camp Leader at Okefenokee NWR, Route 2 Box 3330 Folkston, GA 31537.

Name of Child: ____________________________________________
Grade level: ____________________________ School you attend________________________

Which Day did you enjoy the most? (You can circle more than one day)
(a) Day One – Wetland Ecology ____________________________
(b) Day Two – Cultural History ____________________________
(c) Day Three – Refuge Management issues

Which Activity did you enjoy the most? (You can circle more than one activity)
(a) Compass Skills/Scavenger Hunt ____________________________
(b) Roll Up Journal ____________________________
(c) Pond Life ____________________________
(d) Animal track/Plant Hike ____________________________
(e) Pottery ____________________________
(f) Log Cabins ____________________________
(g) Palmetto Fans ____________________________
(h) Raking at the Homestead ____________________________
(i) Boat Ride ____________________________
(j) Air/Water Testing ____________________________
(k) Wetland Management ____________________________
(l) Endangered Species ____________________________

Which Activity did you find most difficult? (You can circle more than one activity)
(g) Compass Skills/Scavenger Hunt ____________________________
(h) Roll Up Journal ____________________________
(l) Pond Life ____________________________
(j) Animal track/Plant Hike ____________________________
(k) Pottery ____________________________
(l) Log Cabins ____________________________
(g) Palmetto Fans ____________________________
(h) Raking at the Homestead ____________________________
(l) Boat Ride ____________________________
(j) Air/Water Testing ____________________________
(k) Wetland Management ____________________________
(l) Endangered Species ____________________________

What did you like best about the summer camp? ____________________________________________

What other activities would you like to see in next year’s camp? ____________________________________________

Thank you for your time!!
Summer Camp Evaluation for Instructors

Name of Instructor: ________________________________

Were you provided with adequate directions to prepare for the camp? _______ yes _______ no
If No, what would you suggest ________________________________

How relevant was the camp for the child's age-group? ________________________________

Could the camp activities be relevant from a curriculum stand point? ________________________________

Which activities did you think were successful in implementation? ________________________________

Which activities did you think were not very successful? ________________________________

Which activities did you think could be organized better and how? ________________________________

What other activities would you like to see in future camps? ________________________________

Any other suggestions or comments ________________________________

Thank you for your time!!
Summarized Assessment

From Participants:

What they liked best? — The Kids seemed to have enjoyed a majority of the activities. The interesting point here is that they seemed to have really liked participating in some activities they found to be difficult. For example, even if they found the compass skills a bit difficult, they still enjoyed learning it.

Activities requested by kids for next year —
- Pottery
- Boat Ride
- Hiking and Compass Skills
- Exploring Pond Life
- Do you have the golden ring to go to London and back?
- Fishing
- Bird Watching
- Endangered Species activity

From Parents:

We received very positive feedback from the parents of the participants. They were really glad that this summer camp had been offered to the community. They commented on how their kids were able to experience nature. They also commented on the camp activities helping some of their kids complete certain Boy Scout activities for the year.

From Instructors:

Comments for the Camp
- Overall the camp went of well
- Instructors did a wonderful job
- The activities were relevant from a curriculum stand point
- One of the main drawbacks was the lack of time for feedback at the end of each day.
  This could be improved by adding a half hour to the time frame.
- It received good responses from the community
- Age group of participants was good as they knew some of the basics which helped us save time

Comments for Future Camps
- Good probability to continue summer camps
- Look into existing grants to hire interns whose main project would be creation of the summer camp
- Improvements for camp include providing a bag for kids to carry all their stuff

- Other themes that can be addressed in future camps include – Fire/Forestry, Birding, Wildlife Observation, incorporating Recycling. The activities for these themes should focus on bigger picture.
- Purchasing options were discussed for future camps including the purchase of a Water quality instrument from USGS.
- Another idea that was discussed is to promote a Junior Ranger Club where the kids can come back quarterly to ONWR to perform an activity that could relate to the following year’s summer camp. Also possibility as having graduates of one camp as helpers for the next camp.
- Ensure if there are children with special needs and accommodate programs accordingly
- Possibility of partnerships with Boy Scouts was discussed.
- Keep in mind managing logistics for existing employees
- Possibility of planning for more than 1 camp per summer based on age or activities
**APPENDIX G. COST ESTIMATE FOR BROCHURE**

### Cost Estimates for Brochure Revisions

*Does not include savings (for ink and paper) from discontinuing single page hand outs on Walking Trails *

<table>
<thead>
<tr>
<th>Brochure Name</th>
<th>Number of Copies</th>
<th>Current Cost ($)</th>
<th>Estimated Cost ($)</th>
<th>Savings/Expenses ($)</th>
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<tbody>
<tr>
<td>General Brochure (will be revised)</td>
<td>20,000</td>
<td>5,000.00</td>
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<td></td>
<td></td>
<td>[&lt;0.25 per copy]</td>
<td>[no. of pages - 16]</td>
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<tr>
<td>Canoe Brochure (will be revised)</td>
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<td>[no. of pages - 16 + 2 colors]</td>
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<td>[8.5/11 - 2 colors]</td>
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<tr>
<td>Mammal's List (will be combined with bird list)</td>
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<td>2,053.00</td>
<td>~2,500.00</td>
<td>~1,093.00</td>
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<td></td>
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<tr>
<td>Bird List (will be combined with mammal list)</td>
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<td>1,540.00</td>
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<td></td>
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<td>[11/17 - 4 colors]</td>
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<tr>
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<tr>
<td>Swamp Walk Trail Guide (will be discontinued)</td>
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**Total Savings ($) (1093+1028+1028)**

- - - - ~3,149.00

**Total Additional Expenses ($) (2440+59+39)**

- - - - ~2,538.00

**Savings for Refuge ($) (3149-2538)**

- - - - ~611.00

*Does not include savings (for ink and paper) from discontinuing single page hand outs on Walking Trails and Homestead.

** Option of Canoe Brochure being FOLD UP -- Cost will be ~ $900.00 for 5,000 Brochures
APPENDIX H. EXAMPLE OF BIRD BINGO
World Wetlands Day celebrations begin on February 2, 2003, marking the sixth consecutive year of the international awareness campaign. This date commemorates the signing of the 1971 Convention on Wetlands in the Iranian city of Ramsar. The Convention is an intergovernmental treaty promoting international cooperation and national action for the conservation and wise use of wetlands. World Wetlands Day is celebrated by governmental agencies, non-governmental agencies, and other groups of concerned citizens to promote the importance and universal benefits of wetlands. Since 1997, consequent World Wetland Day activities are organized around specific themes, including the importance of water to life, and people and wetlands.

The focus for World Wetlands Day 2003 is "No Wetlands - No Water", stressing the role wetlands play in provision of freshwater. The World Summit on Sustainable Development in Johannesburg last year highlighted distressing statistics on public accessibility to freshwater - 1 billion people living without access to freshwater, 1.7 billion living in water scarce areas, and 1.3 billion living in extreme poverty. The year 2003 has been devoted to examining existing freshwater issues and attempts to find solutions to the universal concerns pertaining to freshwater accessibility and use.

With growing freshwater issues, it is increasingly important to identify the role of wetlands in the context of freshwater availability. The term "wetlands" encompasses a wide variety of aquatic habitats including swamps, marshes, bogs, prairies and flood plains. Natural wetlands are characterized by a natural supply of water, forming an intermediary between land and aquatic ecosystems. Freshwater wetlands perform a dual function of improving the quality and quantity of freshwater by storing the freshwater and working as a filter to enhance water quality. These wetlands also play a crucial role in the freshwater cycle by aiding in the recharging of ground water supplies. It is necessary to maintain healthy wetlands as it could play a vital role in the world's freshwater supply.

The Okefenokee Swamp in Georgia forms one of the world's largest freshwater ecosystems and has been selected as a "Wetland of International Importance" under the Ramsar Convention. It forms the headwaters for both the St. Mary's and the Suwannee River. Swamp habitats in this area include marshes, cypress forests and upland islands. Numerous wildlife species including black bears, alligators, bob-cats and the endangered red cockaded woodpeckers make their homes here. The Okefenokee National Wildlife Refuge was established in 1937 to preserve this ecosystem and currently encompasses around 396,000 acres, of which 353,000 acres are designated as Class I Wilderness Area. The Okefenokee remains one of the most
well preserved freshwater areas in America.

The U.S. Fish and Wildlife Service is the principal federal agency responsible for conserving, protecting and enhancing fish, wildlife and plants and their habitats for the continuing benefit of the American people. The Service manages the 95-million-acre National Wildlife Refuge System that encompasses more than 540 national wildlife refuges, thousands of small wetlands and other special management areas. It also operates 70 national fish hatcheries, 64 fishery resource offices, and 78 ecological services field stations. The agency enforces federal wildlife laws, administers the Endangered Species Act, manages migratory bird populations, restores national significant fisheries, conserves and restores wildlife habitat such as wetlands, and helps foreign governments with their conservation efforts. It also oversees the Federal Aid program that distributes hundreds of millions of dollars in excise taxes on fishing and hunting equipment to state fish and wildlife agencies.
News Release
National Wildlife Refuge System

For Immediate Release
March 3, 2003

Contact: Gisella Burgos at 912-496-7366 x 232 or Roopa Kamesh at 912-496-7836

Okefenokee National Wildlife Refuge Celebrates a Century of Conservation with the National Wildlife Refuge System

"If you stay in touch with national wildlife refuges, you may have a keener sense of values that can really make a positive and lasting impact on your entire life. Together, we can help save critters and habitat by providing wildlife with a place to live so everyone has a chance to experience these stunningly beautiful areas, as well as places to fish and recreate." Sam D. Hamilton, Southeast Regional Director, U.S. Fish and Wildlife Service.

March 14, 2003, marks a special time of celebration this year -- the 100th anniversary of the National Wildlife Refuge System. President Theodore Roosevelt, a world-renowned hunter, on March 14, 1903, took the first monumental step to create the world’s finest system of conservation lands - places where wildlife comes first, by setting aside Pelican Island in Sebastian, Florida as America’s first federal wildlife sanctuary. Thanks to his courageous effort, Americans now have 95 million acres to call their own in 540 very special places around the country. These lands - the National Wildlife Refuge System - remain today as America’s only network of federal lands dedicated to wildlife conservation.

Nearly all of the U.S. Fish and Wildlife Service’s 540 national wildlife refuges are open to the public for wildlife compatible recreation. Environmental education programs are offered on most refuges; fishing is allowed on 260 refuges, and hunting on 300. More than 35 million people visit national wildlife refuges annually.
Okefenokee National Wildlife Refuge is one of the 540 refuges in the country. It is located in Georgia and was established as a refuge in 1937 to preserve the rare and beautiful Okefenokee Swamp. The refuge includes close to 396,000 square acres, extending 38 miles north to south and 25 miles east to west. The Okefenokee is a vast bog inside a huge saucer shaped depression that was once part of the ocean floor. The name "Okefenokee" means land of the trembling earth, referring to the unstable nature of the peat deposits that make up the swamp floor. The habitats in the swamp are varied including islands, lakes, cypress forests and open prairies defined by fire and water.

The Okefenokee is home to numerous plant, bird and animal species including endangered red cockaded woodpeckers, sand hill cranes, indigo snakes, black bears, bobcats among many others. Wildlife management, including fire management and prescribed burns, in the Okefenokee Refuge is imperative for the continuity of the swamp and is carried out by refuge staff and volunteers. Management activities include water surveys, wildlife population studies and habitat studies. Visitor services within the Okefenokee Refuge include, walking trails, boat tours, photography, fishing and hunting. Wilderness canoeing forms one of the chief attractions in the refuge.

To mark the “100th Anniversary of the Centennial Celebrations” for the National Wildlife Refuge System, Okefenokee National Wildlife Refuge will host a booth on March 15, 2003, near the Post Office in Folkston that will provide 2nd day Stamp cancellations. Timings for the booth are 8:00 a.m. - 12:00 noon. This stamp cancellation will commemorate the centennial celebrations. At 1:00 p.m., there will be a birthday cake cutting at Okefenokee NWR east entrance visitor center. For more information on the centennial celebrations, please visit the Okefenokee Refuge or call 912-496-7366.

Celebrate the Centennial by visiting the Okefenokee National Wildlife Refuge or a refuge near you. You can also learn more about this priceless legacy at www.fws.gov.

The U.S. Fish and Wildlife Service is the principal federal agency responsible for conserving, protecting and enhancing fish, wildlife and plants and their habitats for the
continuing benefit of the American people. The Service manages the 95-million-acre National Wildlife Refuge System that encompasses 540 national wildlife refuges, thousands of small wetlands and other special management areas. It also operates 69 national fish hatcheries, 64 fishery resource offices and 78 ecological services field stations.
APPENDIX K. RCW CLUSTER MAP IN 2001