SANDHILL LAKES MITIGATION BANK
(FITZHUGH CARTER TRACT)
OF
ECONFINA CREEK WILDLIFE MANAGEMENT AREA

ANNUAL REPORT 2010-2011

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

INTRODUCTION

The Sand Hill Lakes Mitigation Bank property (referred to hereafter as the Carter Tract) is a 2,155-acre parcel located in south-central Washington County, approximately five miles north of State Road 20 and one mile west of State Road 77. The Carter Tract was purchased by the Northwest Florida Water Management District (NWFWMD) in October 2003, and established by the Florida Fish and Wildlife Conservation Commission (FWC) as a tract of the Econfina Creek Wildlife Management Area (WMA). A mitigation bank permit from the Florida Department of Environmental Protection (DEP) was issued to the NWFWMD in August 2005 to manage the property. Management objectives identified by the NWFWMD include wetlands restoration, preservation, and management, aquatic habitat preservation, erosion control, and uplands restoration and management. In June 2005, FWC entered into a cost-share agreement with the NWFWMD to develop and implement a comprehensive fisheries and wildlife management program for the Carter Tract. Following six years of successful partnership, in April 2011 this agreement was renewed for an additional three years through 2014.

HABITAT

Ecological and Land Cover Classification

The Carter Tract harbors several distinct ecological communities. A significant portion of the property is upland sandhill habitat (approx. 1,150 acres), which was historically logged for longleaf pine (*Pinus palustris*) and re-planted in pine plantation or left to regenerate with pine (*Pinus* spp.), live oak (*Quercus virginiana*), and scrub oaks (*Quercus* spp.). Interspersed within the uplands are approximately 850 acres of mesic and hydric habitats comprised of Swamp Lakes, Basin Swamps and Marshes, Seepage Streams, isolated Depression Marshes, Mesic Flatwoods, Baygalls, Wet Prairie, and Seepage Slopes. The remaining 150-acres are natural Sinkholes and Sinkhole lakes (isolated, steep-sided karst ponds and shallow, gently-sloping lakes).

Historic communities have been degraded by timber operations and suppression of natural fire regimes. Restoration efforts by NWFWMD, including herbicide application,

native groundcover plantings (i.e. wiregrass (*Aristida stricta*), toothache grass (*Ctenium aromaticus*), and prescribed burning; Figure 1) continued at the Carter Tract during 2010-11, transitioning land cover classifications closer to their targeted goals.

Figure 1. Between July 2010 and June 2011, NWFWMD conducted 256 acres of dormant season prescribed burns on the Carter Tract of Econfina Creek WMA, Washington County, Florida.

Water Levels

Water levels on Carter Tract ponds and creeks have historically fluctuated in cycles lasting several years. Water gauges were installed on the Carter Tract by NWFWMD in 2005, and readings were recorded monthly by FWC field staff beginning in January 2006. Following large rain events that filled up once-dry area ponds during spring 2009, water levels on all area ponds remained constant or increased until drought conditions returned in mid-April 2011 (Figure 2). FWC staff were able to conduct electrofishing surveys on Dry, Black, and Green Ponds before water levels dropped substantially.

Extremely low water levels in Green Pond 1 and Powerline Pond forced the closing of these water bodies to fishing in early June.

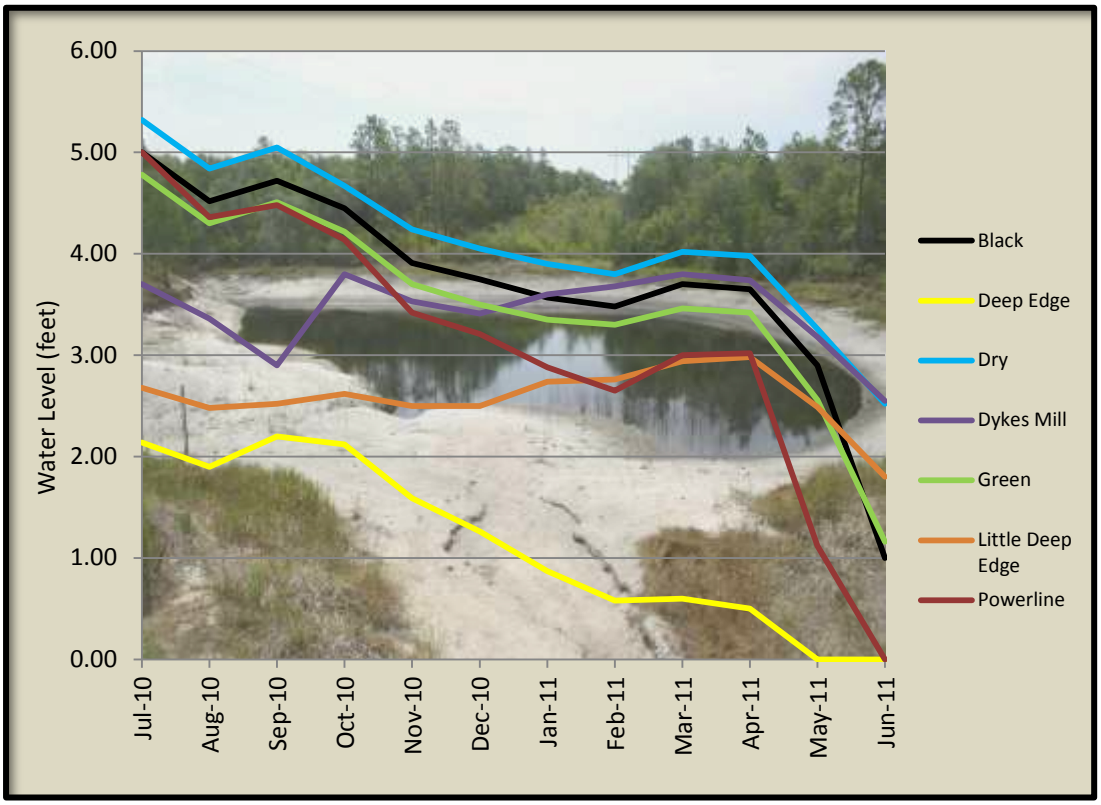

Figure 2. Monthly fluctuations in water levels from July 2010-June 2011 on major waterways located at the Carter Tract of Econfina Creek WMA, Washington County, Florida.

Photo Plots

In an effort to visually document the progression of natural areas over time, annual photographs were taken at established locations (plots), facing predetermined azimuth bearings. Sixty-three photo plots on the Carter Tract document natural community responses to restoration efforts such as prescribed burning and tree removal, as well as natural events (i.e. drought conditions; Figure 3). Infrastructure maintenance and improvements such as road-grading, bridge construction, and facility enhancements are also documented. Photo plot photographs will continue to be taken annually, documenting all habitat types, water bodies, and infrastructure on the area.

Figure 3. Photo plot pictures help to document natural water level fluctuations such as these between May 2010 (left) and May 2011 (right) at Dry Pond boat ramp.

FISH AND WILDLIFE POPULATIONS

Working in cooperation with the NWFWMD, the responsibilities of FWC-Division of Habitat and Species Conservation on the Carter Tract are to conduct fish and wildlife population surveys/assessments, collect/analyze biological data, evaluate results, administer public fishing and hunting programs, provide recommendations for adjustments in harvest designed to optimize fish and wildlife populations, and oversee other fish- and wildlife-based recreational opportunities. The following are monitoring and management programs developed to address targeted species and public opportunities. Appendix I presents the 2010-11 Fitzhugh Carter Tract Hunting and Fishing Regulations Summary and Area Map. Appendix II presents the FWC Annual Work Plan and Accomplishment Report for July 30, 2010 – June 30, 2011.

FRESHWATER FISH

Fish Population Assessment

Given adequate water levels, fish population assessments are conducted twice a year during spring and fall. In the past, Wegener rings were used to conduct baitfish surveys for gauging recruitment and prey base status (Wegener et al., 1974). However, high-water conditions during spring 2010 necessitated the use of fyke nets as an alternative sampling method (Hubert, 1996). Fyke nets proved to be a more efficient and

productive method of capturing target fish species (i.e. baitfish and young-of-year sportfish) compared to Wegener rings. Therefore, fyke nets were used during fall 2010 and spring 2011, and will continue to be used on the Carter Tract as the preferred method for surveying baitfish populations and young-of-year (YOY) sportfish recruitment. Electrofishing continued during fall 2010 and spring 2011 on Black, Dry, and Green Ponds to assess mature sportfish populations, measuring catch-per-unit-effort (CPUE). Baitfish and sportfish surveys will continue to be coducted twice each year given adequate water levels.

Fyke Nets

Fyke nets were used in October 2010 and April 2011 to measure baitfish abundance and YOY sportfish recruitment. When possible, fyke nets are set at the same locations during spring and fall each year. However, low water conditions during spring 2011 required adjustment of two net locations (Figure 4). Fyke nets were 24-inches square, made of 1/8-inch mesh with two-inch wide throat plates and a two-inch diameter funnel ring. The lead line was 15-feet in length, with lead weights and floats spaced every three- and 12-inches on the bottom and top, respectively (Figure 5).

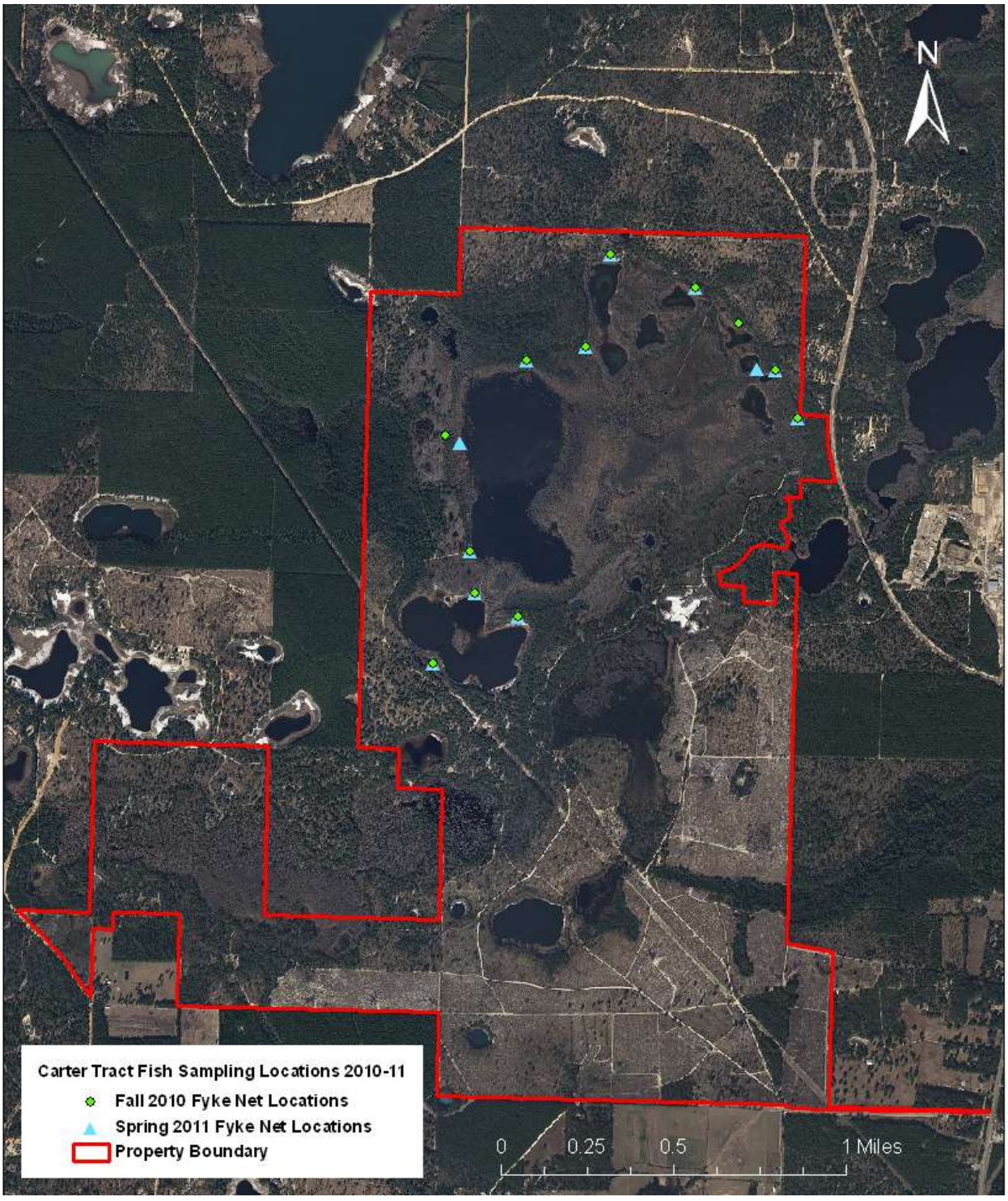

Figure 4. Fyke net locations used during October 2010 and April 2011 on the Carter Tract of Econfina Creek WMA, Washington County, Florida.

Figure 5. Fyke net used to sample percent species occurrence in Black, Dry, and Green Ponds on the Carter Tract of Econfina Creek WMA, Washington County, Florida, May 2010.

Average percent occurrence of each species was calculated for each pond per season; these data are illustrated graphically in Figures 6 and 7 and tables with specific values can be found in Appendix III. Overall during fall 2010 and spring 2011 the eastern starhead topminnow (*Fundulus escambiae*), dollar sunfish (*Lepomis marginatus*), blue-spotted sunfish (*Enneacanthus gloriosus*), and mosquitofish (*Gambusia affinis*) were the most abundant baitfish. For YOY sportfish, warmouth (*Lepomis gulosus*) and bluegill (*Lepomis macrochirus*) were the most abundant species during both fall 2010 and spring 2011 surveys. Baitfish and sportfish capture trends were consistent with previous years' trends. However, one important finding was the capture of YOY largemouth bass (*Micropterus salmoides*) from all ponds during the spring 2011 survey. This is the first time YOY largemouth bass have been captured using either Wegener rings or fyke nets since fall 2005. This is encouraging to see and suggests that size/bag limits at the Carter

Tract may be helping to bolster the largemouth bass population by removing some of the larger (≥8 inches) predatory bluegill and restricting the take of largemouth bass.

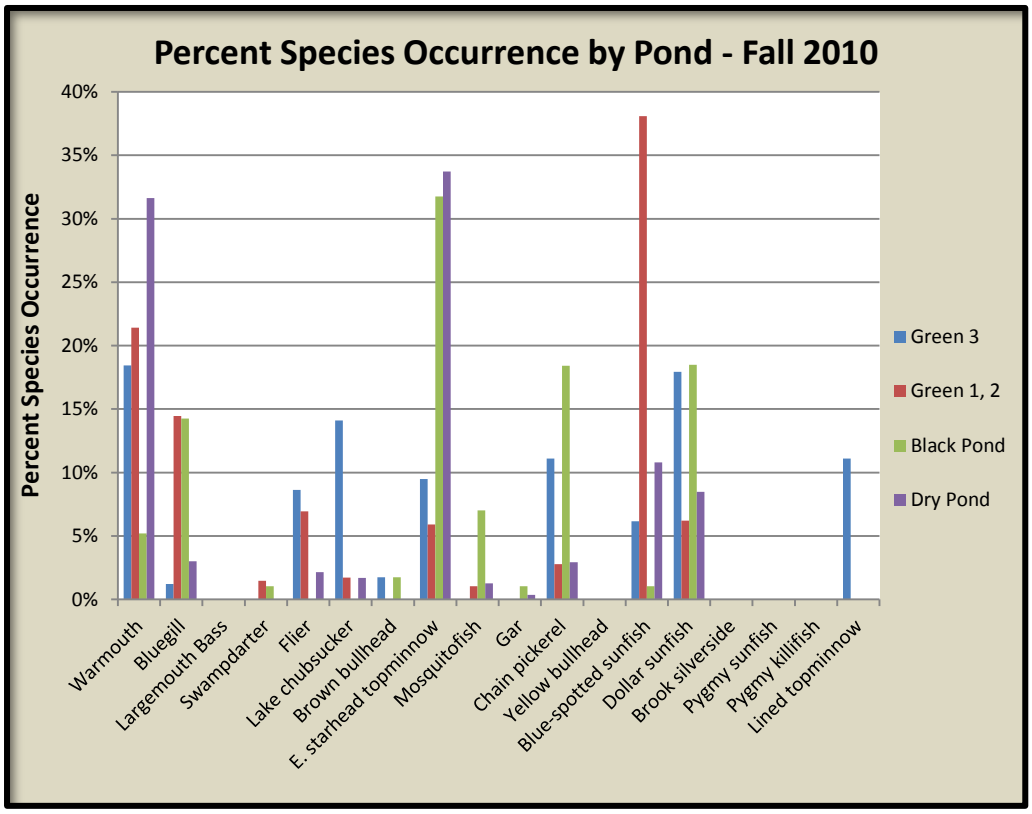

Figure 6. Percent species occurrence measured during October 2010 using fyke nets on Black, Dry, and Green Ponds at the Carter Tract of Econfina Creek WMA, Washington County, Florida.

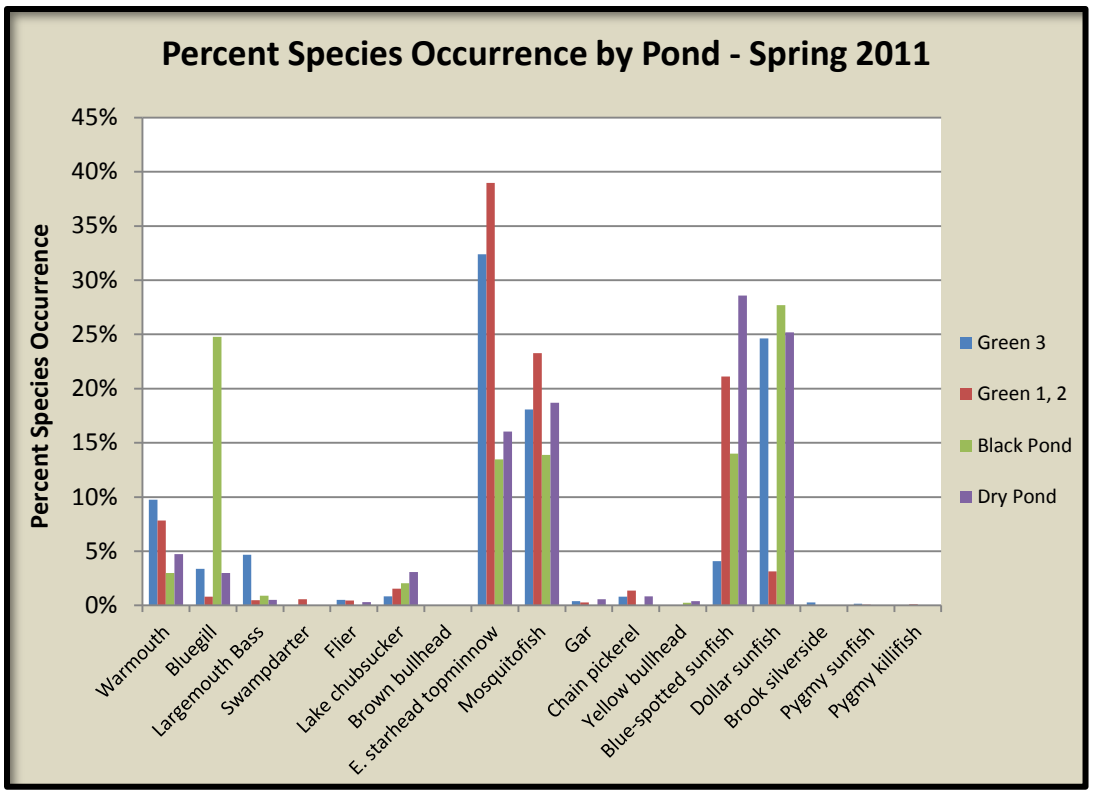

Figure 7. Percent species occurrence measured during April 2011 using fyke nets on Black, Dry, and Green Ponds at the Carter Tract of Econfina Creek WMA, Washington County, Florida.

Electrofishing

Sportfish abundance on Black, Dry, and Green Ponds was measured during October 2010 and April 2011. An 18-foot aluminum vessel with Smith-Root® generator-powered pulsator electrofisher and two six-foot shocking booms was deployed. Direct current power settings were set at 120 pulses per second and 680 volts; average amperage generated was between 1-2 amps. Two dippers using ½-inch mesh dipping nets captured, measured, weighed, and released all affected fish (Figure 8). Sportfish abundance for each pond was calculated as catch-per-unit-effort (CPUE), or the number of fish sampled per minute. A breakdown of the CPUE for each species captured per pond during fall 2010 and spring 2011 is presented in Appendix IV. Graphs illustrating sportfish abundance trends from 2005 – 2011 for each pond sampled are presented in Figures 9, 10, and 11 (note that not all seasons were sampled for each pond each year due to water level restrictions).

Figure 8. Electrofishing was conducted on Dry, Black, and Green Ponds in Octoberber 2010 and April 2011 to sample sportfish populations at the Carter Tract of Econfina Creek WMA, Washington County, Florida.

Bluegill remained the most abundant sportfish in Black and Green Ponds, which is consistent with overall trends from 2005-2011. However, black crappie numbers in these ponds increased compared to previous sampling efforts (Figures 9 and 10). Dry Pond sampling trends were less clear with warmouth and largemouth bass the most common species in fall 2010 and spring 2011, respectively (Figure 11). It was encouraging to see higher largemouth bass abundance in all ponds during spring 2011. More largemouth bass were recorded in Dry and Green Ponds during the spring 2011 sample compared to the fall 2010 sample (Figures 9 and 10). One reasonable explanation for this might be that low water levels during the spring 2011 sample may have forced these fish out of flooded cypress trees, exposing the fish to a greater probability of being shocked to the surface in more open water. These data support the assumption that size/bag limits that encourage the harvest of large (≥8 inches) predatory bluegill and restrict the harvest of any largemouth bass may be helping to bolster largemouth bass recruitment and will ultimately help balance out the bluegill/largemouth bass population. While subsequent years of additional sampling are needed to confirm this assumption, current trends suggest that largemouth bass numbers have increased. Electrofishing on Black, Dry, and

Green Ponds will continue to take place biannually (spring and fall) given adequate water levels.

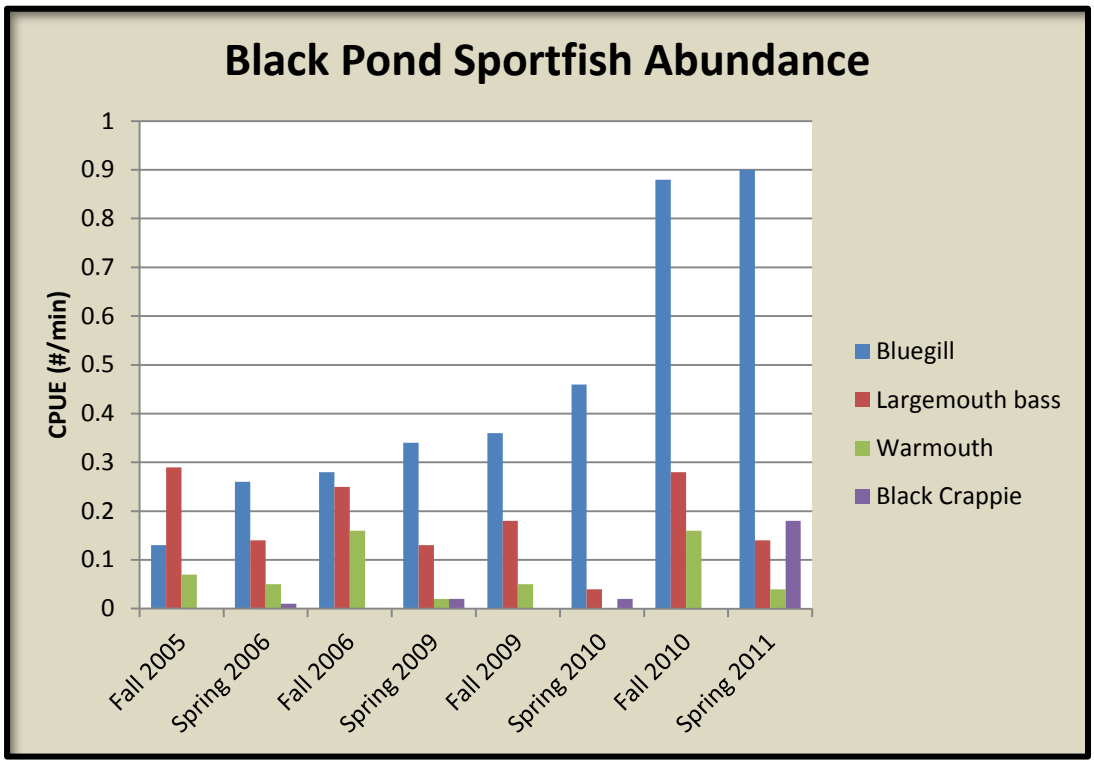

Figure 9. CPUE results from Fall 2005 – Spring 2011 sampling efforts on Black Pond, Carter Tract of Econfina Creek WMA, Washington County, Florida.

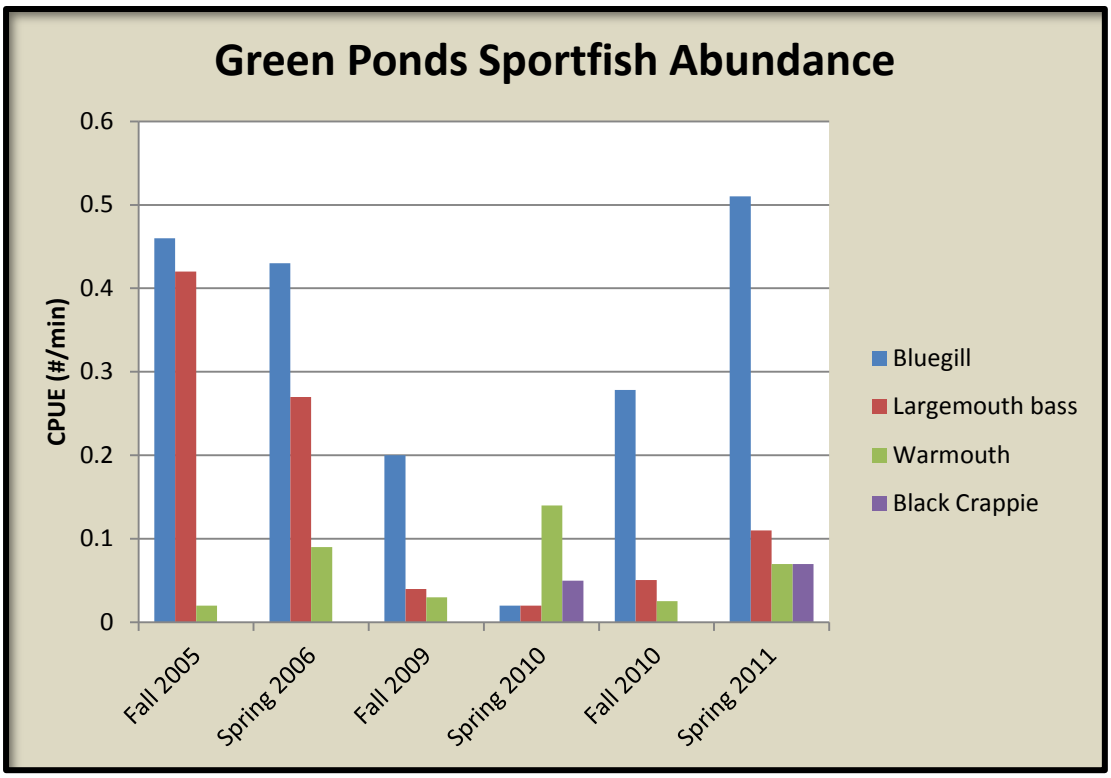

Figure 10. CPUE results from Fall 2005 – Spring 2011 sampling efforts on Green Ponds, Carter Tract of Econfina Creek WMA, Washington County, Florida.

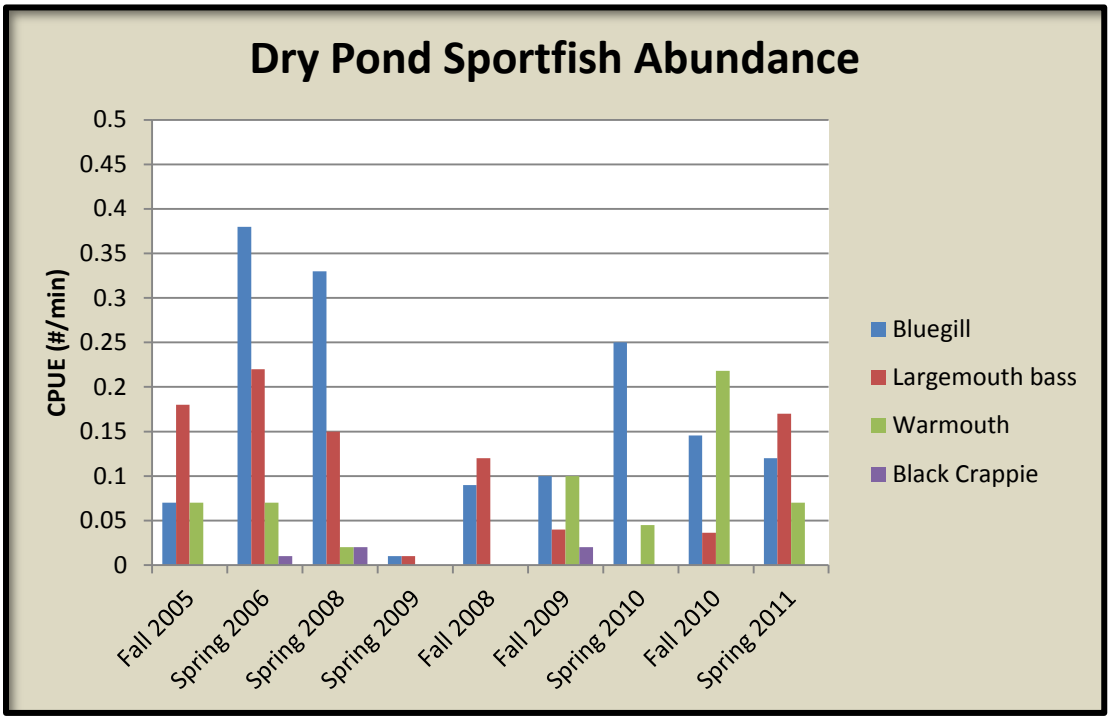

Figure 11. CPUE results from Fall 2005 – Spring 2011 sampling efforts on Dry Pond, Carter Tract of Econfina Creek WMA, Washington County, Florida.

Age - Length Analysis

To provide the most accurate and comprehensive assessment of fish populations on Carter Tract water bodies, it is necessary to determine the age of fish sampled through various survey techniques. Age determination is important for capturing age structure of fish populations and measuring sportfish recruitment levels (Devries and Frie, 1996). These data are imperative for making adjustments in size and bag limits as populations change over time as a result of the natural progression of aquatic ecosystems and angler harvests. Because fish exhibit indeterminate growth, total length does not provide a suitable basis of comparison for age. For example, fish that have access to more nutrient-rich food and less turbid water will grow faster than fish that do not. Therefore, a dependable method of aging is needed to compare total length measurements with age to develop a baseline of growth over time. One such method involves extraction and examination of one pair of otoliths. Otoliths are hard, calcium carbonate structures located behind the brain of bony fish and are used for balance and sound detection. When fish grow slowly in the winter, an opaque ring forms on the otolith, and when fish grow faster in the summer, a more transparent ring is formed on the otolith. By counting the annuli on the otolith, the age of the fish in years can be determined. Fish have three sets of otoliths: the sagitta, asteriscus, and lapillus. The largest set of otoliths, the sagittae, is most commonly used to age fish (Devries and Frie, 1996). .

Samples were collected from fish captured during our surveys on the Carter Tract (i.e.electrofishing, fyke nets, and minnow traps). Non-target fish captured in hoop traps during spring turtle trapping were also utilized, and otoliths were opportunisitically collected from angler creels. Only a small sample of fish captured during the above surveys were kept and sacrificed for otolith extraction, and FWC staff focused on obtaining samples representing multiple size classes from the four most common sportfish species (bluegill, warmouth, black crappie, and largemouth bass). Otoliths were extracted using standard laboratory techniques and annuli were counted using an AO Scientific Instruments Model 40 microscope with 30-watt light (Figure 12).

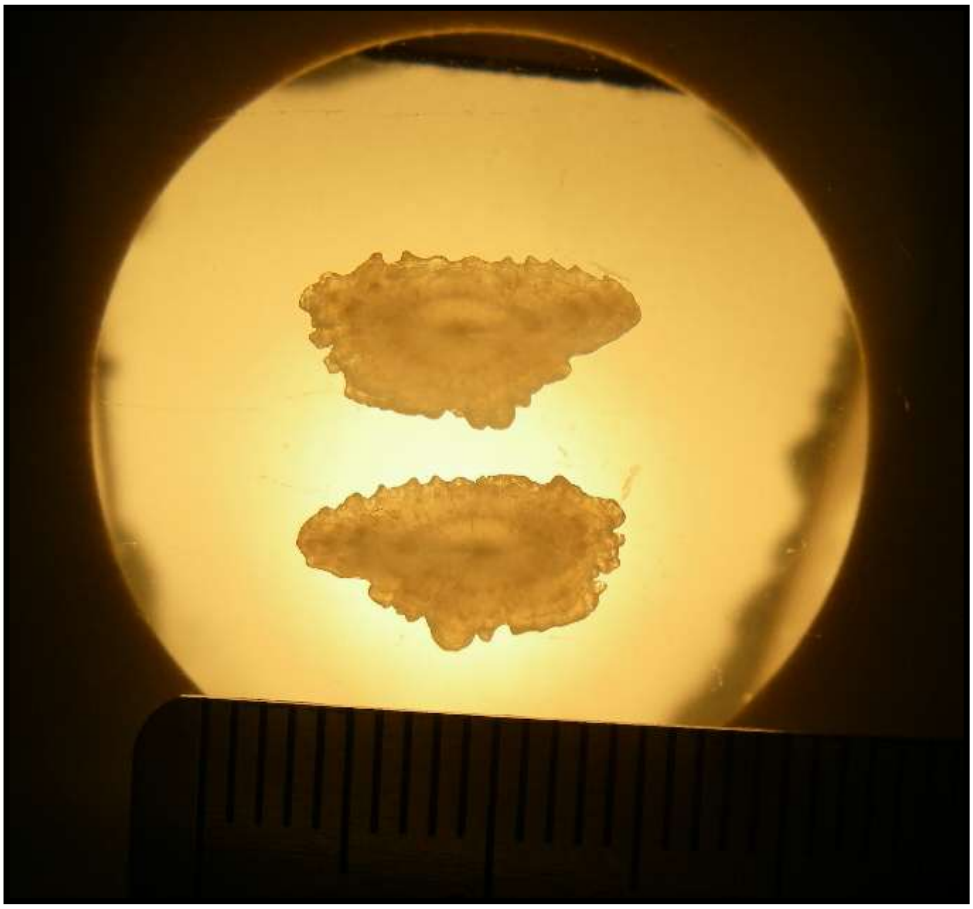

Figure 12. Extracted otoliths from a 410-millimeter largemouth bass; this individual was determined to be four years of age.

Between October 2010 and May 2011, otoliths were collected from warmouth (n=55), bluegill (n=42), largemouth bass (n=20), and black crappie (n=6) captured from Dry, Black, and Green Ponds (Figure 13). It should be noted that these are preliminary data, and additional samples will be taken in the future to increase the robustness of the length/age frequency dataset for Carter Tract water bodies . These data will ultimately be used in concert with YOY recruitment data from fyke net captures, mature sportfish measurements from electrofishing, and public fishing creel data to ensure that size and bag limits for sportfish are appropriate for current populations and adjusted when necessary as sportfish populations within fishable Carter Tract water bodies evolve over time.

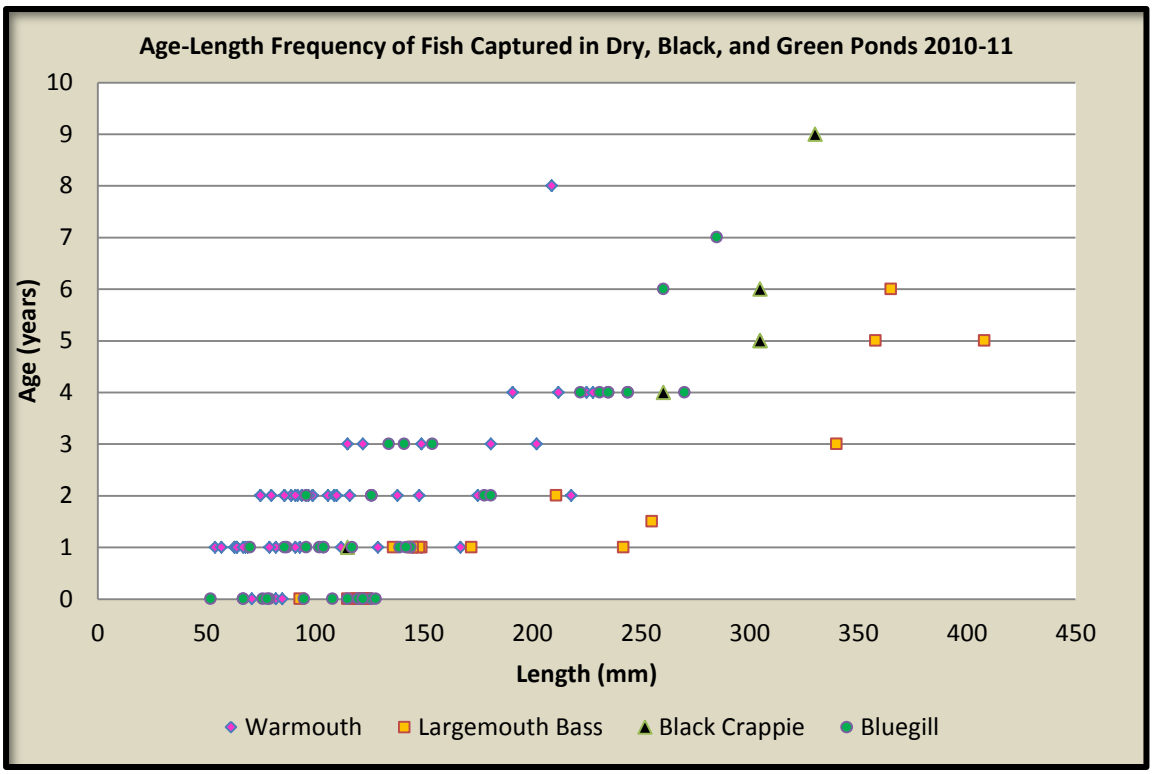

Figure 13. Age-Length frequency of Warmouth, Largemouth Bass, Black Crappie, and Bluegill from Dry, Black, and Green Ponds of the Fitzhugh Carter Tract of Econfina Creek WMA, Washington County, Florida, 2010-2011.

Public Fishing

The Public Fishing Program on the Carter Tract continues to provide anglers with the unique opportunity to fish smaller (farm pond style) bodies of water with comparatively low fishing pressure. Angler participation reached its highest level to date during 2010-11, with 1,629 anglers logging 6,637 fishing hours (Figure 14). This represents a 211% and 244% increase in number of anglers and hours fished during the previous year, respectively. The filling of Green Ponds during May 2009 marked the end of the temporary reduction in the daily angler quota, raising the daily quota of anglers from 16 back up to 20/day. Fishable water levels were maintained on all available fishing ponds until June 2011 when low water levels on Powerline Pond and Green Pond 1 forced closure of these two ponds. However, these ponds receive comparatively low fishing pressure (Figure 15). Such closings likely had little impact on overall fisherman participation, as evidenced by the drastic increase in number of hours fished during 2010-11 compared to previous years. Word-of-mouth advertisement and exposure in a local

newspaper (Appendix V) continue to draw new anglers to the Carter Tract Fishing Program, bolstering annual participation.

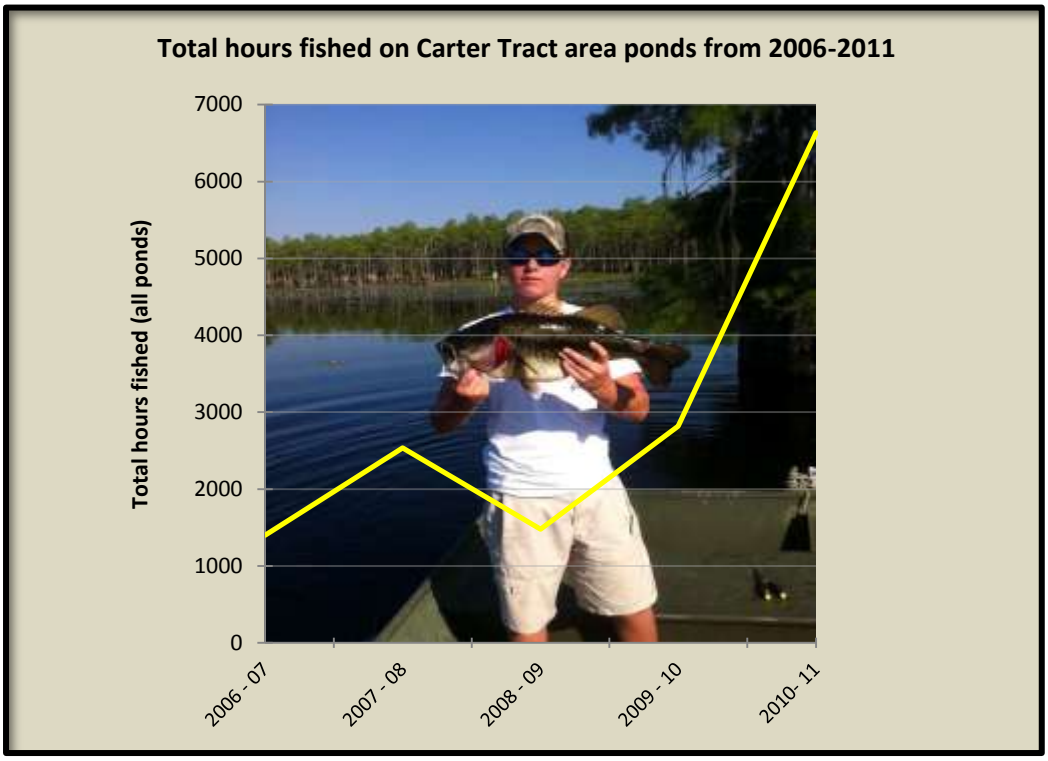

Figure 14. Total number of hours fished from 2006-11 on all area ponds combined at the Carter Tract of Econfina Creek WMA, Washington County, Florida.

Fishing pressure on the Carter Tract was calculated based on the total number of possible fishing hours from July 1, 2010 through June 30, 2011. Out of a possible 41,180 fishing hours anglers fished 6,637 hours yielding just over 16% usage, an 11% increase from the previous fishing season. Dry pond was the most fished pond during 2010-2011 (Figure 15), which is a shift from the previous season when Black Pond received more angler activity. Angler participation per month was relatively consistent with past trends, with a lull in activity during the winter months due to cold weather and temporary closures for hunting seasons. December remained the least fished month; however, January and February participation increased dramatically from zero hours fished during January/February 2010 to 790 hours fished during January/February 2011 (Figure 16).

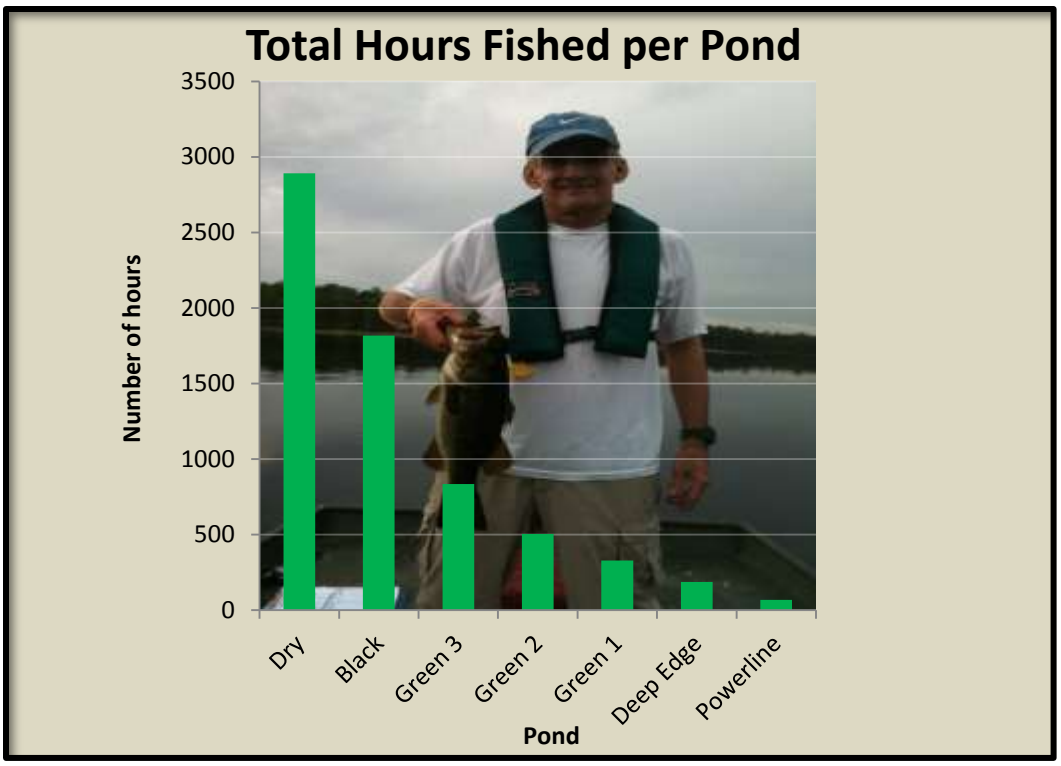

Figure 15. Hours fished per pond from July 2010 – June 2011 at the Carter Tract of Econfina Creek WMA, Washington County, Florida.

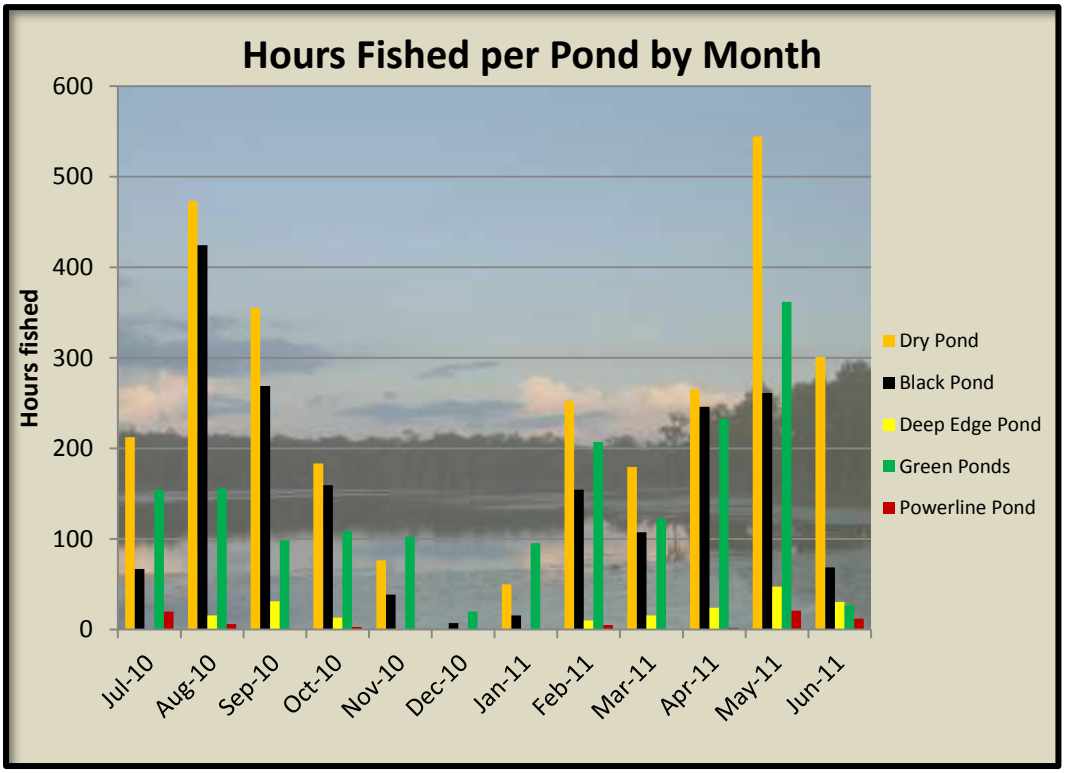

Figure 16. Number of anglers per month utilizing the Fishing Program on the Carter Tract of Econfina Creek WMA, Washington County, Florida, July 2010 – June 2011.

A total of 4,452 sportfish representing five species were caught on Carter Tract ponds during 2010-11. This is a 123% increase compared to 3,606 fish caught during 2009-10. Figure 17 illustrates the number of fish caught per species for each pond. Bluegill comprised 63% of fish caught, followed by black crappie (*Pomoxis nigromaculatus*), largemouth bass, warmouth, and catfish (*Ameirus nebulosus* and *Ameirus natalis*) with 18%, 15%, 3%, and 1% respectively. Figure 18 illustrates capture trends from 2007-11 for the three most caught sportfish species. The dramatic dip in bluegill catch during 2008-09 may have been contributed to the drought that closed all Green Ponds to fishing and reduced Dry and Black Ponds to a fraction of their normal volume until heavy rains in May 2009 returned ponds to fishable water levels. The increasing trend in number of black crappie and largemouth bass caught over the years is probably due to a combination of increased fishing pressure and recruitment due to appropriate size and bag limits. Total number of fish caught and released per pond was calculated based on angler-reported creel data (Appendix VI). Fishing success rate, defined as the number of fish caught per hour of fishing effort, was calculated for each pond and all water bodies combined (Table 1).

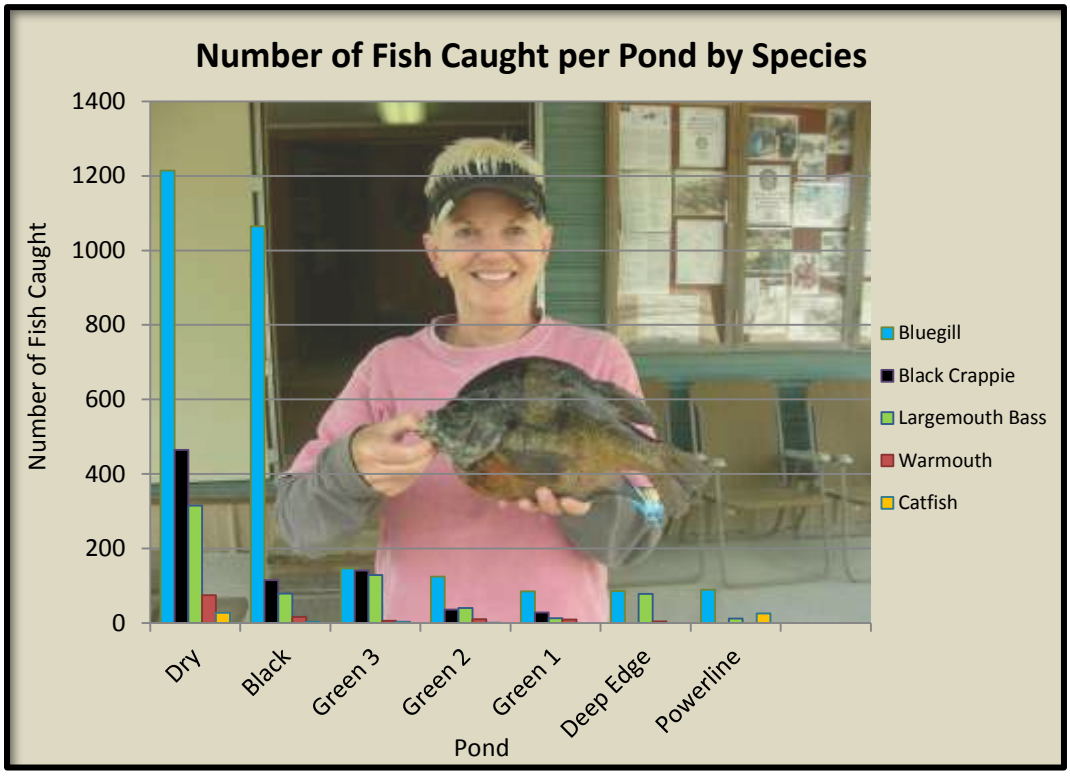

Figure 17. Number of sportfish caught by species per pond at the Carter Tract of Econfina Creek WMA, Washington County, Florida, July 2010-June 2011.

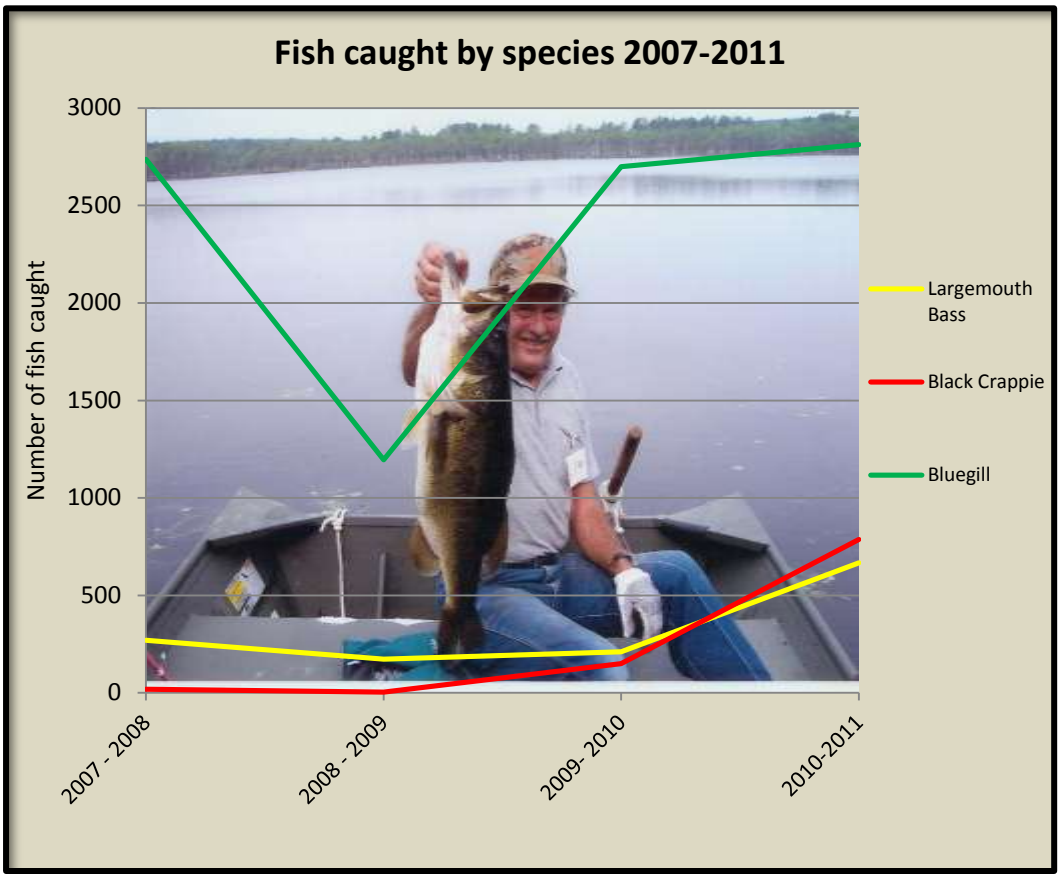

Figure 18. Sportfish capture trends from 2007-11 on all area ponds of the Carter Tract of Econfina Creek WMA, Washington County, Florida.

Table 1. Fishing success rate (fish caught/hours of fishing effort) on area ponds at the Carter Tract of Econfina Creek WMA, Washington County, Florida, July 2010 - June 2011.

Pond	Angler success rate (fish/hour)
Dry	0.7
Black	0.7
Green 3	0.5
Green 2	0.4
Green 1	0.4
Deep Edge	0.9
Powerline	1.9
All Ponds	0.7

WILDLIFE POPULATIONS

White-tailed Deer

Management Objectives

The primary white-tailed deer (*Odocoileus virginianus*) management objective for the Carter Tract is to provide quality hunting opportunities while managing optimal herd health. Specific objectives are to attain a herd density of 16-26 deer/mi^2 (25-40 acres/deer). With limited hunting dates and a conservative hunt format, our goal is to attain a harvest consisting of antlered deer predominantly in the 3.5+ age classes. In addition to offering a quality buck harvest, we plan to bolster and maintain a high degree of hunter participation with the implementation of limited antlerless deer harvest, dependent upon herd expansion. Achieving these objectives requires active monitoring and management of the population, as well as habitat.

Population Trends

Reliable annual indices of population size are fundamental to successful deer herd management. Indices provide an estimate of relative abundance, rather than true population size. However, because the specific relationship between the index and population density is not known, the real value of population surveys is to evaluate trends over time. Deer density on the Carter Tract is estimated using data collected from line-transect distance sampling (LTDS) surveys, which utilizes modeling to account for deer detectability. Precision seems to be higher when compared to standard spotlight surveys.

LTDS on the Carter Tract was conducted along two routes, one 2.5-miles long and the other 3-miles long, and were replicated six times in September 2010. Surveys began approximately one hour following official sunset, and were driven along the pre-selected routes via pickup truck with two observers in the back, each equipped with a one-million candlepower Q-beam® spotlight. Deer were detected by eye shine and the following data were recorded: number of deer, distance to deer, direction/bearing from vehicle, age (adult versus fawn), and gender (if determinable). Distance and bearing data were calculated using a Leupold® RXB-IV digital rangefinder/binocular. Figure 19 depicts

the line transect routes used on the Carter Tract, along with locations of deer observed during 2010 surveys.

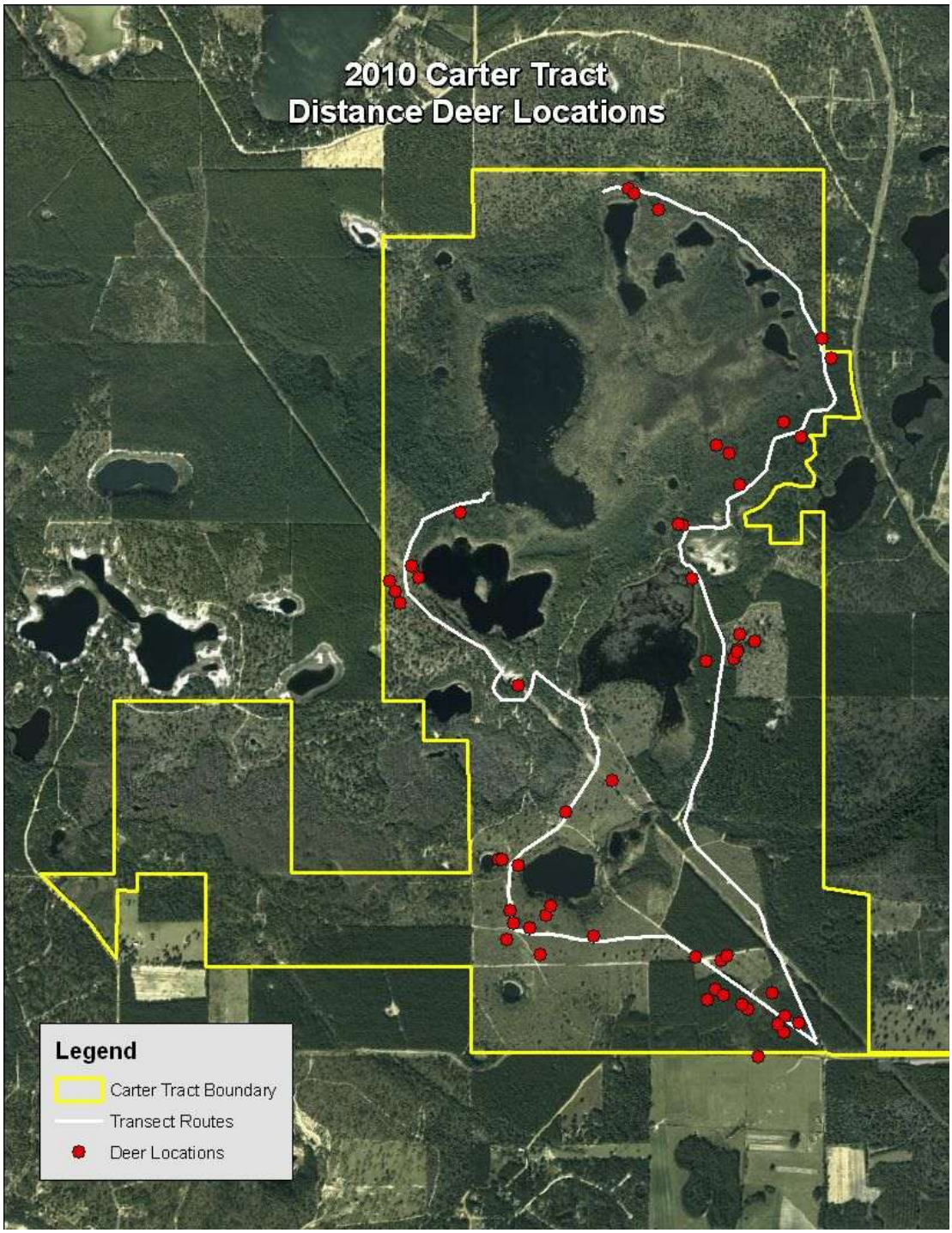

Figure 19. Survey routes and location of deer observations during the September 2010 line-transect distance sampling conducted on the Carter Tract of Econfina Creek WMA, Washington County, Florida.

Preseason deer density for 2010 was estimated at 10.8 deer/mi^2(95% CI: 6.6, 16.1), using the software DISTANCE 5.0. Release 2 (Thomas et al,. 2006). This index was a decrease from the 19 deer/mi^2 estimated during 2009, and dips back below our population goal for the first time since 2008 (Figure 20). However, the calculated mean of 19 deer/mi^2 estimated during 2009 carried with it very wide confidence intervals (2.5 – 37.5) due to marked differences in deer observations between the two routes. Often, a wide confidence interval (CI) can suggest density estimates could be on the high end (i.e. 2009 density index). Conversely, while the 2010 estimate was lower than it had been in two years, the CI was much narrower. It is likely that our 2010 estimate of 10.8 deer/mi^2 may more closely approach the actual deer density on the property. A number of factors can influence deer detectability during spotlight transect surveys, and thus create what appear to be contradictory or confusing population trends. Typically, variance estimate in DISTANCE has three components: variance due to observers' ability to detect animals along the transect (detection probability); variability between transect lines (encounter rate); and variance due to group size (cluster size). Further, vegetation composition and height, weather variables, recent burning activity, etc. can all influence deer activity. Therefore, several subsequent years of surveys will be required to produce a clearer relative abundance, from which stronger inferences of trends in population size can be drawn.

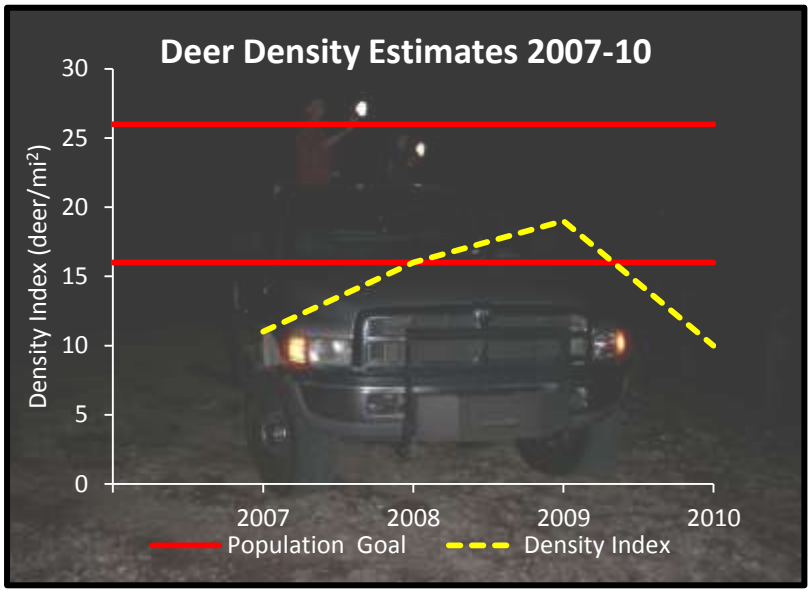

Figure 20. Trend in White-tailed deer density as estimated using line-transect distance sampling at the Carter Tract of Econfina Creek WMA, Washinton County, Florida, 2007-10.

Harvest and Hunting Pressure

Deer hunters and their guests logged a total of 159 man-days of hunting during the 2010-11 season. This a slight decrease from the 174 man-days reported during the 2009-10 season. Figure 21 illustrates the distribution of hunter use per the six quota hunts offered on the Carter Tract from 2007-11. In 2010-11, the second phase archery and third phase general gun hunts yielded the highest participation with 37 and 33 hunters, respectively. Muzzleloading gun hunter participation was consistent with the 2009-10 season, deomonstrating an increase in muzzleloader hunting interest for the second year in a row. Participation in all other hunt types remained fairly consistent, save for a slight decrease in man days utilized during the General Gun II quota hunt.

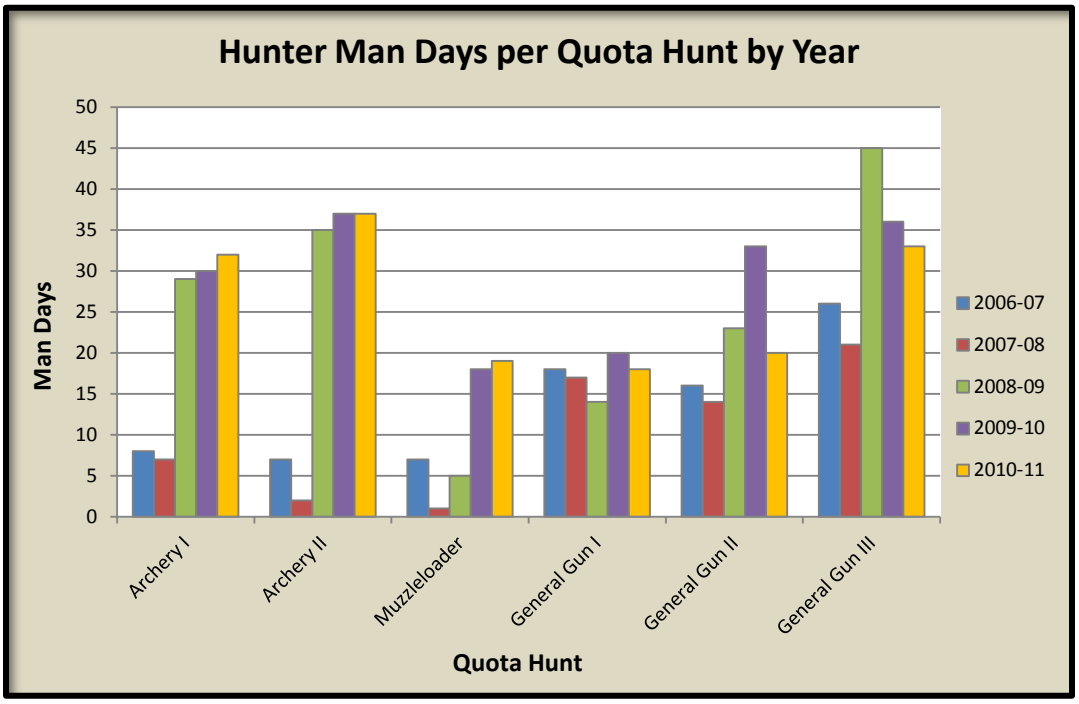

Figure 21. Comparison of hunter participation by quota hunt from 2006-11 on the Carter Tract of Econfina Creek WMA, Washington County, Florida.

Overall hunter success rate (calculated as the number of deer harvested per man-days hunted) is depicted in Figure 22, and is compared over the last five deer seasons. Overall hunt success (compiling all quota hunts) for the 2010-11 season was estimated at approximately one deer/25 man-days (4.4%), compared to one deer/29 man-days (3.5%) realized in 2009-10.

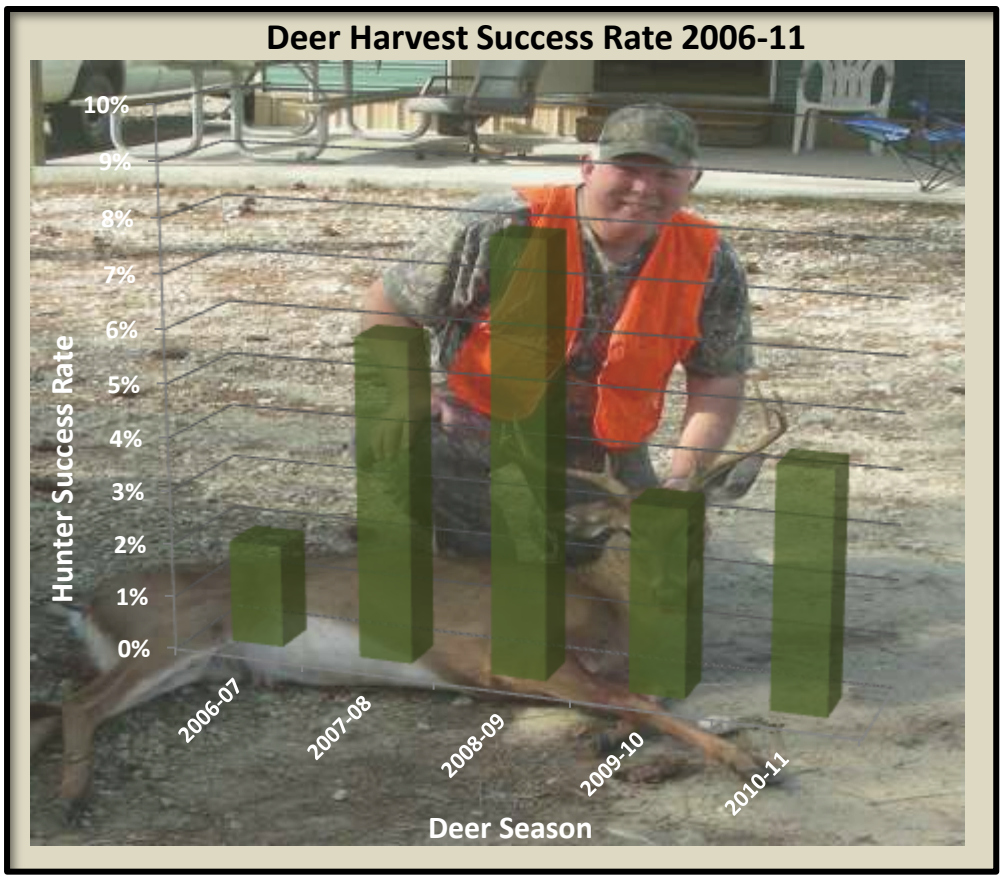

Figure 22. Comparison of overall hunter success rate from 2006-11 at the Carter Tract of Econfina Creek WMA, Washington County, Florida.

All quota permit hunters were required to check-in/out at the Carter Tract check station in order to monitor hunter pressure and collect biological data from harvested deer. Seven deer (all bucks) were harvested on the Carter Tract during 2010-11 compared to six deer harvested the previous season. Mean physical parameters of all deer harvested per quota hunt season are presented in Table 2. The three smallest/youngest deer were taken during the Archery II quota, while the remaining four deer were harvested during the General Gun quota phases I and II and were more mature. A deer breeding chronology study was initiated in 2009 by FWC with preliminary results calculating mean conception dates for the southern Washington County area to be approximately January 26th (Garrison et al., 2009). It is therefore not surprising that the more mature deer were harvested during quota hunts which took place later in the winter during primary rutting activity. The largest deer harvested was an 8-point, 2.5-year-old buck weighing 130 pounds (Figure 23).

Table 2. Morphometric parameters of deer harvested during 2010-11 quota hunts on the Carter Tract of Econfina Creek WMA, Washington County, Florida.

Quota Hunt	Mean Physical Parameters 2010-11						
	Gender	Age (yrs)	Weight (lbs)	Antler points	Avg beam length (cm)	Avg beam circum. (cm)	Inside spread (cm)
Archery II	Buck	1.5	95	2	22	-	-
Archery II	Buck	1.5	70	5	21.5	2.95	15
Archery II	Buck	1.5	98	4	16	6	-
General Gun I	Buck	3.5	118	8	30.5	5.15	31
General Gun II	Buck	2.5	130	8	26	7	25
General Gun II	Buck	1.5	98	5	26	7	16
General Gun II	Buck	2.5	122	5	28	7	19

Figure 23. This 8-point, 130-pound buck was the largest deer harvested during the 2010-11 hunting season on the Carter Tract of Econfina Creek WMA, Washington County, Florida.

We believe the full potential for deer hunting opportunities on the Carter Tract has not been realized, but is expected to continue to improve in conjunction with habitat quality. Considering herd management objectives, additional antlerless harvests are not needed presently to control population levels. A higher density is desirable to meet our population objectives and improve hunter success rates. The continued protection of does (outside archery season) is necessary to further bolster recruitment and expedite achievement of herd objectives. Limiting the harvest of does will facilitate increases in herd size and improvements in overall age structure, which will in turn affect improvements in hunter success. Further, physiologic and morphometric indices suggest the population can be maintained at still higher densities before eroding herd health.

Disease and Monitoring

Recently there has been a substantial increase in the attention being paid to Chronic Wasting Disease (CWD) by the media, state and federal natural resource agencies, and hunters and outdoor enthusiasts. CWD is a contagious neurological disease that has been found in captive and wild mule deer (*Odocoileus hemionus*), white-tailed deer, moose (*Alces alces*), and Rocky Mountain elk (*Cervus elaphus*) within several midwestern and western states. The disease causes degeneration of the brains of infected animals, resulting in emaciation, abnormal behavior, loss of bodily functions and death. Thus far, no southeastern state, including Florida, has been hit by this disease.

Currently the only practical method for diagnosing CWD is through analysis of brain stem tissue or lymph nodes from dead animals. There is no practical live-animal test. The FWC has initiated a comprehensive active surveillance and monitoring program for CWD. In recent years, we have collected and tested tissue samples from hunter killed deer from the Carter Tract and surrounding counties. Even low numbers of CWD-positive deer would be cause for concern, so we plan to continue this disease surveillance for the foreseeable future.

Wild Turkey

Management Objectives

1. Encourage and maintain a population of wild turkey (*Meleagris gallopavo*), providing a high quality hunting experience to the public.
2. Continue to provide and enhance high quality habitat for wild turkeys by maintaining an open understory and encouraging herbaceous groundcover via habitat improvement activities such as prescribed burning.

Harvest

Spring turkey season on the Carter Tract consists of three quota hunts, each three days in length. Permit holders are afforded one day prior to each hunt for scouting. Thirty-six hunters participated in the 2011 spring turkey hunts. One gobbler (estimated to be three years old) weighing 18½-pounds with a $9^{5}/_{6}$-inch beard and 1-inch spurs was harvested during the Phase II Turkey Quota Hunt (Figure 24). Turkey hunting success (defined as the number of gobblers harvested/man-days of effort) decreased from 7% in 2010 to 3% in 2011 (Figure 25). This equates to approximately one gobbler/36 man-days of hunting. Turkey harvesting opportunities on the Carter Tract should continue to improve as a more frequent burn regime is maintained for controlling scrub oaks and producing open grassy/herbaceous areas for nesting. Further, more frequent mowing of powerline right-of-ways at strategic times of the year (just post nest-hatching) can provide better bugging conditions for poults. Turkey poults have a high protein demand during the first four weeks of life (Hurst, 1992), and are incapable of flight until approximately ten days old (Williams, Jr. and Austin, 1988). During this flightless period poults are extremely vulnerable to predation. Therefore, increasing the amount of protein available (in the form of insect abundance) should help achieve maximum poult growth and improve survival.

Figure 24. This 18 ½--lb gobbler was harvested during Phase II of the 2011 Spring Turkey Hunt on the Carter Tract of Econfina Creek WMA, Washington County, Florida.

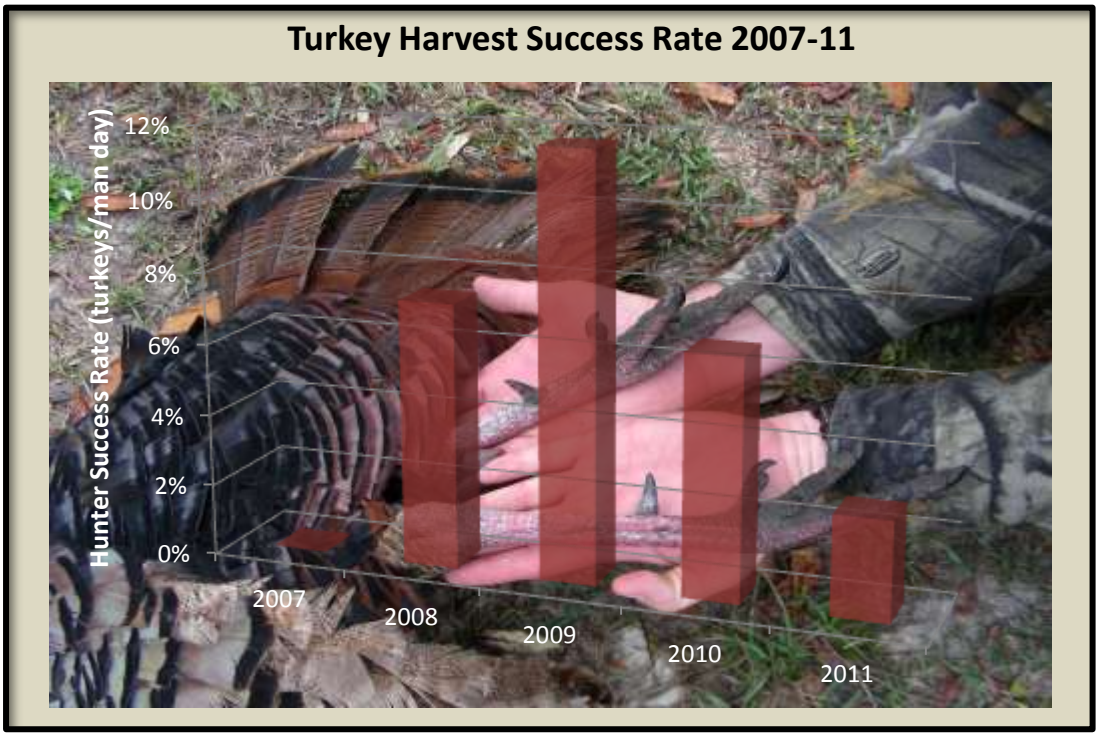

Figure 25. Turkey harvest success rate from 2007-11 on the Carter Tract of Econfina Creek WMA in Washington County, Florida.

Small Game

The Carter Tract is open annually to small game hunting during a 16-day non-quota season each December. Small game can also be hunted by permit holders during deer quota hunts, provided there is season overlap between the game being hunted and deer quota hunt dates. Hunters are encouraged not only to hunt popular small game such as gray squirrel (*Sciurus carolinensis*), rabbit (*Sylvilagus* spp.), and northern bobwhite (*Colinus virginiana*), but also for taking wild hogs (*Sus scrofa*), which are occasionally encountered on the property. While the number of small game hunters dropped slightly during the 2010-11 season compared to previous years, participation has remained relatively constant over the years (Figure 26). During 2010-11, nineteen hunters harvested a total of five gray squirrels and nine northern bobwhite. Figure 27 depicts small game harvest success at the Carter Tract from 2005-11. Squirrel harvest success has been relatively sporadic over the years; however, bobwhite harvests reached an all-time high during winter 2010. It is encouraging to see bobwhite harvest numbers increase, perhapsin response to habitat restoration efforts.

Figure 26. Small game hunter participation on the Carter Tract of Econfina Creek WMA, Washington County, Florida, 2005-11.

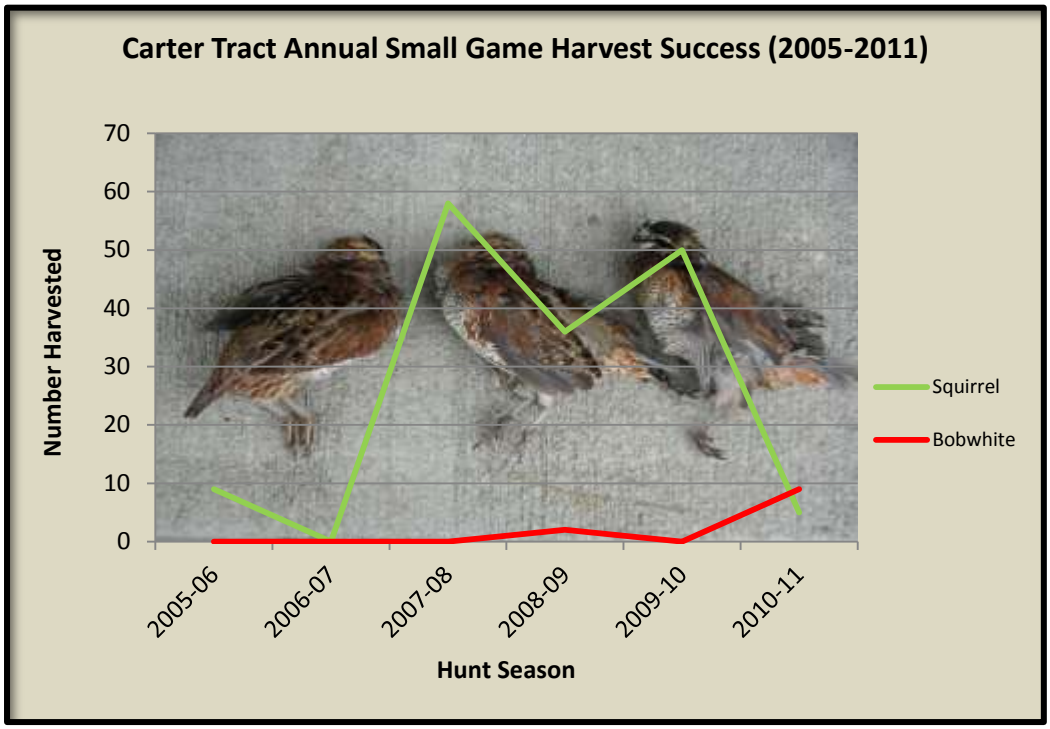

Figure 27. Small game harvest success from 2005-11 on the Carter Tract of Econfina Creek WMA, Washington County, Florida.

Waterfowl

Harvest

The Carter Tract provides a special five-day early duck season each September. Seventeen hunters took advantage of this hunt during 2010, harvesting 11 wood ducks (*Aix sponsa*). Additionally, the 2010-11 regular waterfowl season coincided with portions of the muzzleloading, general gun, and small game seasons on the Carter Tract. Waterfowl hunting during this time yielded a total of nine man-days and a harvest of five wood ducks and seven ring-necked ducks (*Aythya collaris*). Duck harvests during 2010-11 yielded a hunting index of 0.9 ducks/man-day. Duck hunter participation and harvest success rates from 2006-11 on the Carter Tract are represented in Figures 28 and 29, respectively. Duck hunter participation has increased annually since 2008 while harvest success rate has declined slightly each year.

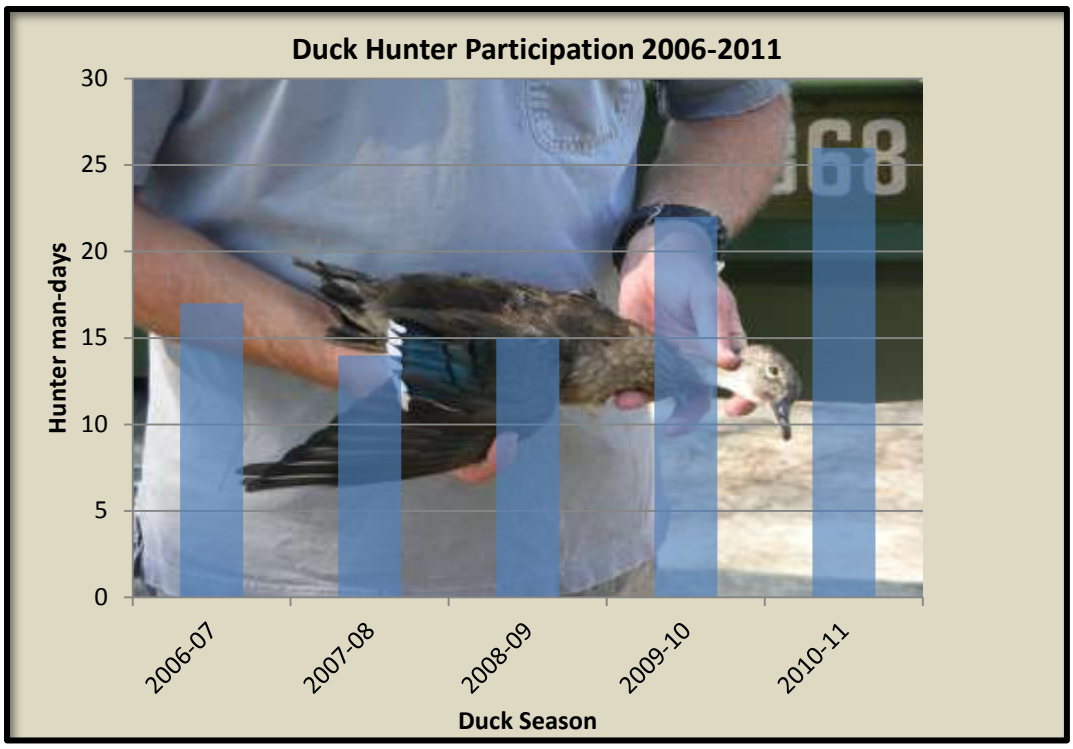

Figure 28. Duck hunter participation from 2006-11 at the Carter Tract of Econfina Creek WMA, Washington County, Florida.

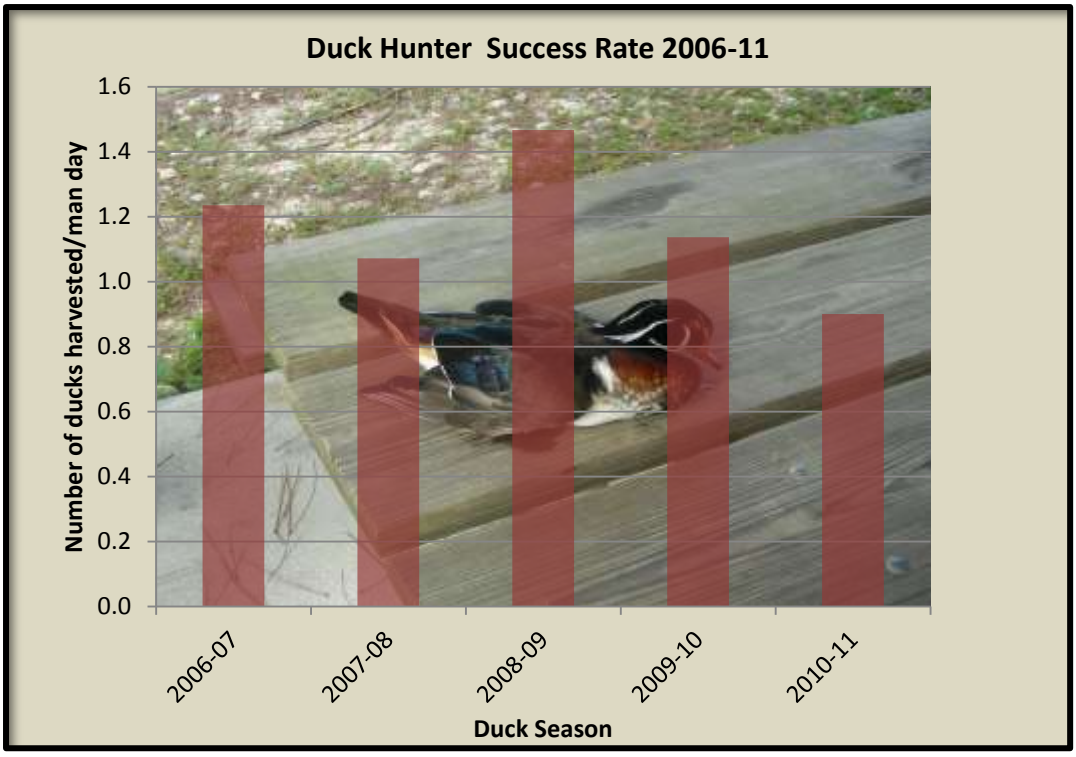

Figure 29. Duck hunter success rate (ducks harvested/man-day) on the Carter Tract of Econfina Creek WMA, Washinton County, Florida, 2006-11.

Wood Duck Nest Boxes

Efforts to monitor and facilitate local breeding populations of wood ducks continued on the Carter Tract, with quarterly monitoring efforts on 50 nest boxes that were erected in winter 2005. Boxes are checked three times throughout the breeding season (March – September) to determine occupancy and nest fate, and yearly winter checks allow boxes to be cleaned and repaired as needed. Following initial implementation, it takes several years for a wood duck nest project to develop. Female wood ducks are philopatric, meaning that they typically return to the same areas from which they were hatched, and once they breed, often return to the same nesting site year after year (Hepp et al., 1987). Table 3 presents data that support this fact, showing that percent of Carter Tract wood duck boxes reused each year continues to increase. With drought conditions persisting throughout the majority of 2007 and part of 2008, occupancy dropped slightly during 2008. Water levels rebounded in spring 2009, facilitating increased use during 2009 and 2010. However, drought conditions recurred in May 2011 (Figure 30), which may help explain the slight drop in wood duck box use from 2010 (n=29) to 2011 (n=25). While overall use decreased slightly, 68% of wood duck boxes used during 2010 were used again in 2011. Figure 31 depicts the location of nest boxes used by wood ducks on the Carter Tract between 2006 and 2011.

Table 3. Wood duck box occupancy and percentage of boxes reused per year (2006-2011) on the Carter Tract of Econfina Creek WMA, Washington County, Florida.

Year	Total boxes used	New boxes used	Previously used boxes	% boxes reused
2006	6	6	-	-
2007	11	8	3	27%
2008	5	4	1	20%
2009	21	13	8	38%
2010	29	7	22	76%
2011	25	3	22	88%

Figure 30. Extreme drought conditions during summer 2011 left many wood duck boxes completely exposed on dry land during the nesting season (Note average water level inferred by water marks on surrounding trees).

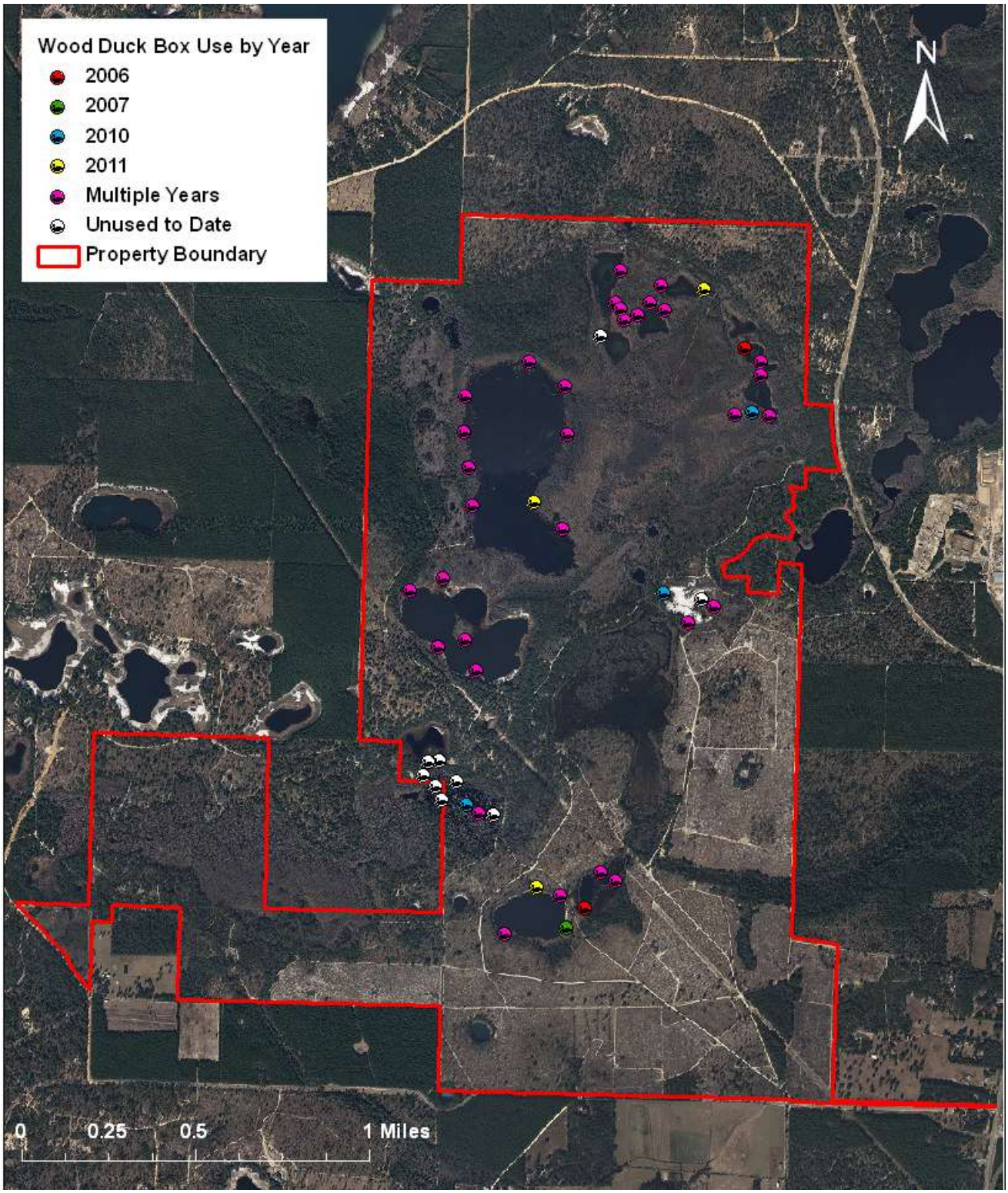

Figure 31. Use of wood duck nest boxes across the Carter Tract of Econfina Creek WMA, Washington County, Florida, 2006-11.

Percent nest success (number of clutches that produced ducklings/total number of clutches) was caculated per year (Figure 32). Nest success increased in 2011 compared to 2010 and reached its highest percentage (62%) since the inception of the nest box program. This was encouraging to see, given the drought conditions that persisted throughout most of the nesting season. Appendix VII presents more detailed data on percent nest success, average clutch size, and estimated ducklings produced/clutch for each water body by year. During annual nest box maintenance conducted in winter 2011, conical predator guards were raised to their highest possible level. This was done to prevent predations during high water years (as was suspected during spring 2010 when high water inudated 74% of nest box predator guards, leaving boxes vulterable to predators).

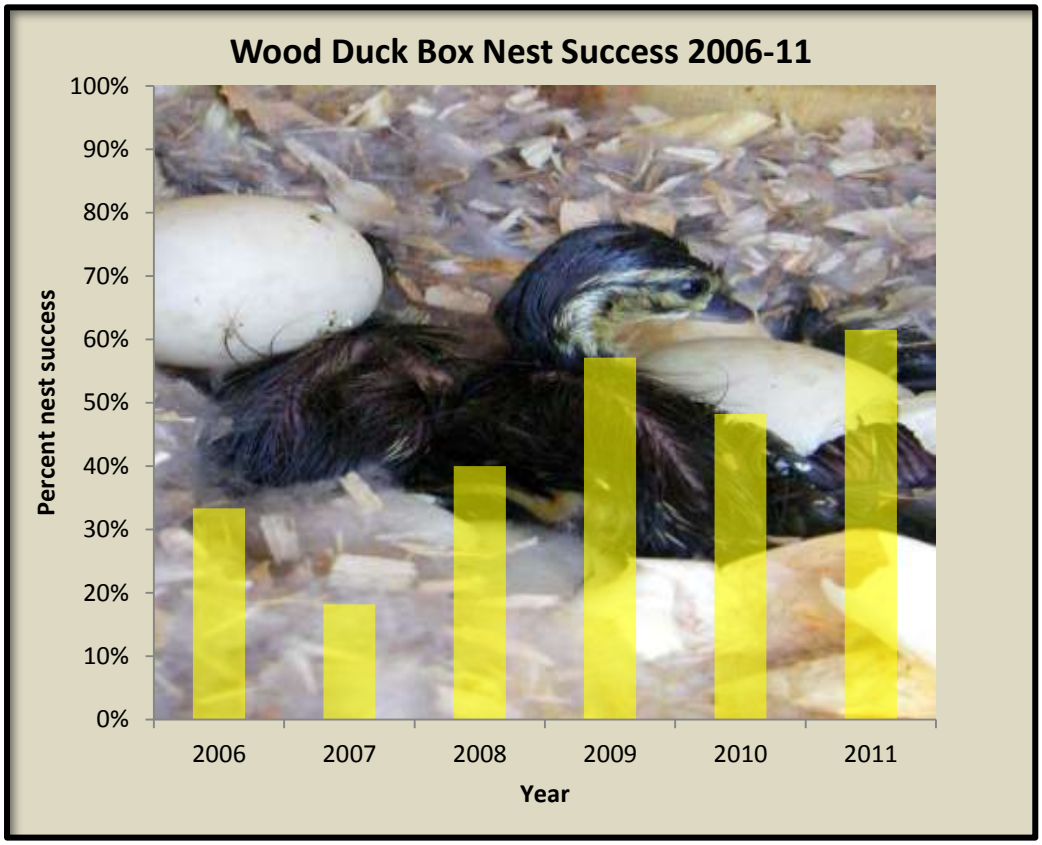

Figure 32. Percent nest success (number of clutches producing ducklings/number of clutches) by year for wood duck *(Aix sponsa*) boxes on the Carter Tract of Econfina Creek WMA, Washington County, Florida, 2006-11.

Evidence of nest box use by a variety of non-target wildlife species has also been documented. Great-crested flycatchers (*Myiarchus crinitus*) are a cavity-dwelling species known for incorporating shed snake skins into nest construction (Harrison, 1975). The presence of this type of nest in several wood duck boxes on the Carter Tract suggests this species takes advantage of vacant boxes annually. Other avian species that have been documented in next boxes on the Carter Tract include chimney swifts (*Chaetura pelagic*), eastern bluebirds (*Sialia sialis*), and eastern screech owls (*Megascops asio*). Two species of mammal have also been documented inside wood duck boxes on the Carter Tract: the southern flying squirrel (*Glaucomys volans*) and southeastern myotis (*Myotis austroriparius*). From fall 2010 to summer 2011, we again documented use of wood duck nest boxes by southeastern myotis, eastern bluebirds, great-crested flycatchers, chimney swifts, and an eastern screech owl (Figure 33). A Carolina wren (*Thryothorus ludovicianus*) was also found in a nest box for the first time during 2011.

Figure 33. An eastern screech owl broods owlets in a duck box on Deep Edge Pond, Carter Tract of Econfina Creek WMA, Washington County, Florida, June 2011.

Avifauna

Parcels, like the Carter Tract, that support a mosaic of unique habitat types often harbor large numbers of bird species. To date, 120 species of bird have been documented as occurring on the Carter Tract (Appendix VIII). New species that were documented during 2010-11 include the swallow-tailed kite (*Elanoides forficatus*), wood thrush (*Hylocichla mustelina*), prairie warbler (*Dendroica discolor*), and ruddy duck (*Oxyra jamaiciensis*). Bird species count should further increase as the various habitat types on the area continue to be enhanced by restoration efforts and subsequent prescriptions. We would expect through continued habitat enhancement and active management, that recruitment of those bird species that rely on specific habitat characteristics should increase, while still providing for the more common generalist species.

Wading Birds

Most wading birds nest semi-colonially in rookeries, often found along the edges of lakes or creeks, or in trees and shrubs growing out of water bodies. Little Deep Edge Pond on the Carter Tract is one such rookery that has been documented as supporting up to 117 individuals representing six species. Rookery surveys are done annually from April – July on the Carter Tract. Adult birds are observed first at a distance using binoculars and a spotting scope to get an accurate count of adult birds. A 10-foot jonboat is then used to approach nesting areas in order to count nests, number of eggs, and number of chicks. Nesting areas are disturbed as little as possible while performing nest, egg, and chick counts. Some nests are often situated in locations that are too difficult to get accurate egg counts. In these instances, average number of eggs/clutch for the species observed is used to calculate estimated fledgling success rates.

Historically, the great egret (*Ardea alba*) has been the most common species observed, as well as the most reproductively successful on the Little Deep Edge rookery. This trend shifted in 2011 when both little blue herons (*Egretta caerulea*) and cattle egrets (*Bubulcus ibis)* incubated more nests than great egrets, producing 14, 12, and 11 nests respectively (Figure 34). Fledgling success rate (number of fledged chicks/eggs laid) of great egrets was calculated at 61%, which is lower than the 75% success realized the previous year (Table 4).

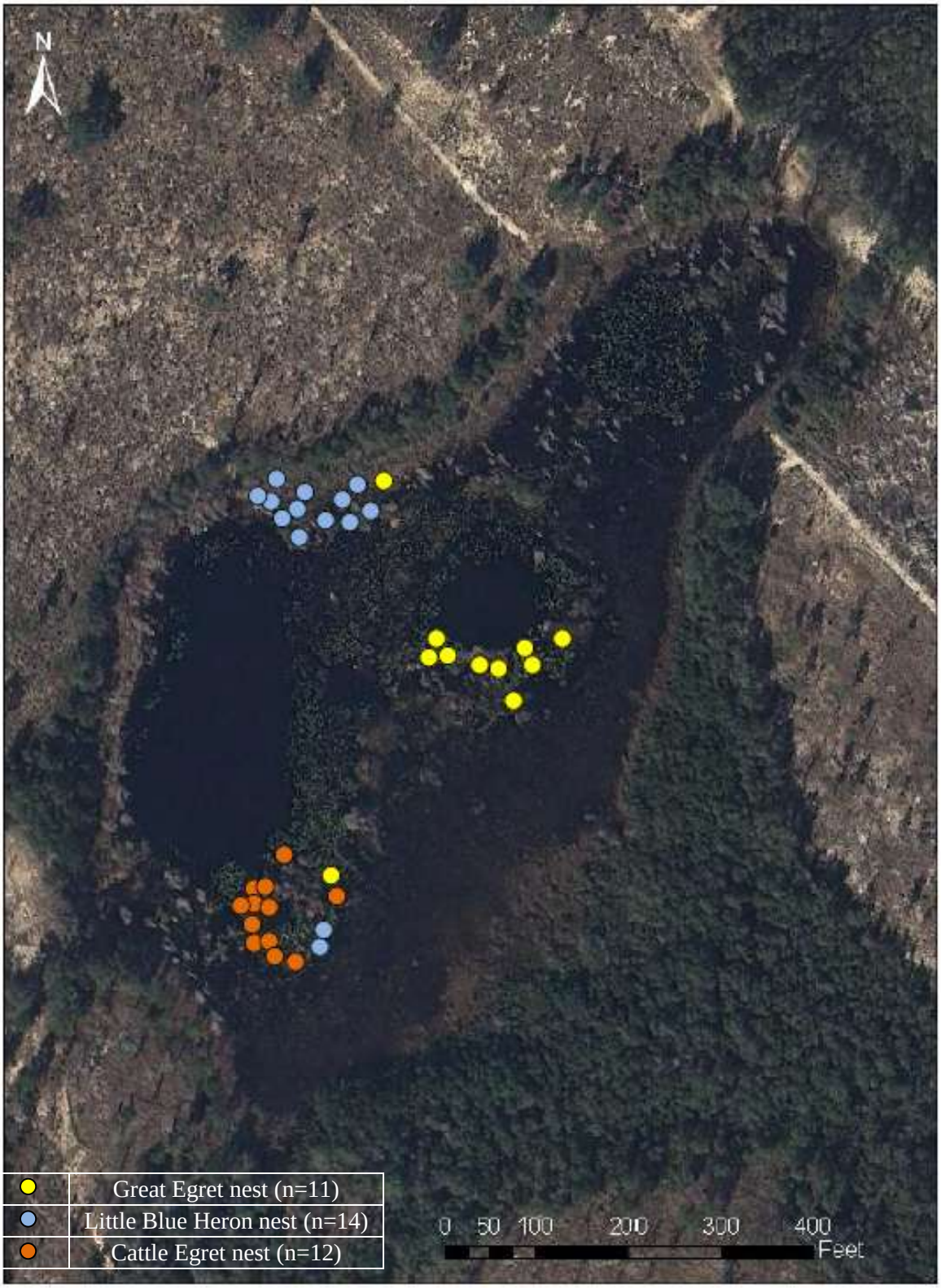

Figure 34. Great egret (*Ardea alba*), little blue heron (*Egretta caerulea*), and cattle egret (*Bubulcus ibis*) nest locations at Little Deep Edge Pond rookery, Carter Tract of Econfina Creek WMA, Washington County, Florida, April-July 2011.

Table 4. Success of little blue heron (*Egretta caerulea*), cattle egret (*Bubulcus ibis*), and great egret (*Ardea alba*) nests at Little Deep Edge Pond rookery, Carter Tract of Econfina Creek WMA, Washington County, Florida, April-July 2011.

Species	Nests	Chicks	Average successful fledging rate
Little Blue Heron	14	34	81%
Cattle Egret	12	24	67%
Great Egret	11	17	61%
Total (all species)	37	75	70%

Two species of special concern (SSC) that were documented on the rookery in 2011 were the tricolored heron (*Egretta tricolor*) and little blue heron. Both species had most recently been observed on the rookery back in 2008 (Figure 35). In 2011, twenty adult little blue herons were observed using the rookery at one time and one adult tricolored heron produced one chick. Fourteen little blue heron nests were counted that produced at least 34 chicks. Some clutch sizes were unknown, but presuming all nests contained three eggs (average clutch size; Rodgers, Jr., 1987) an 81% successful fledging rate was calculated for little blue herons.

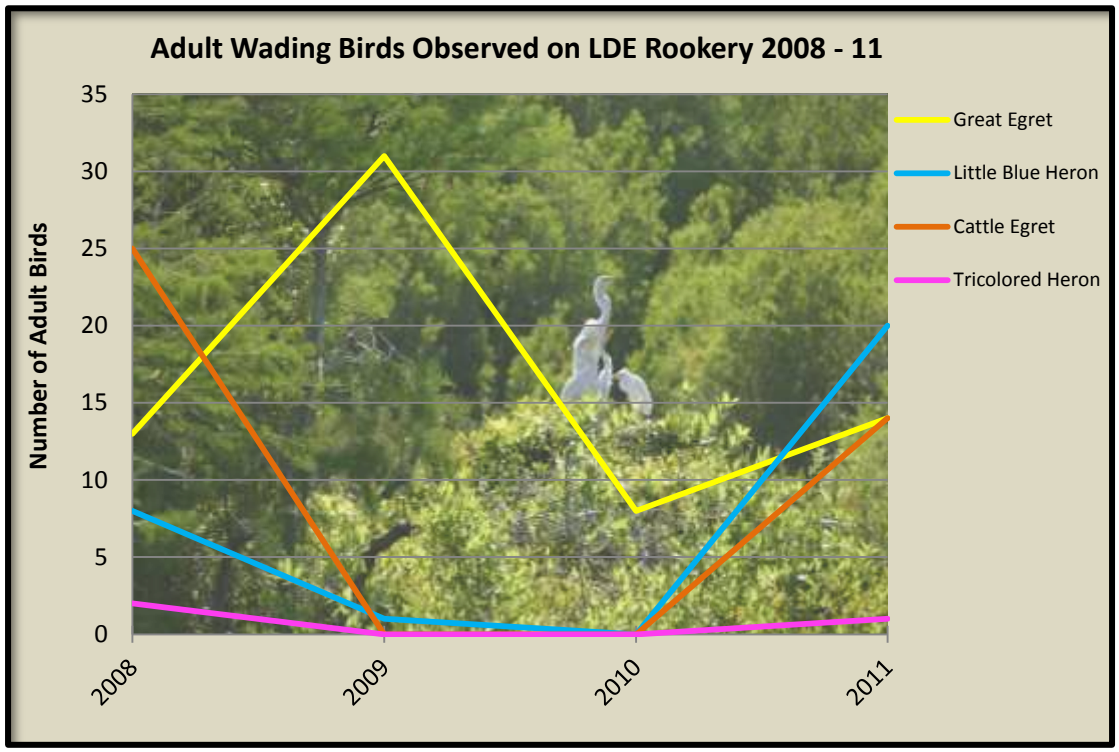

Figure 35. Adult wading birds observed on Little Deep Edge rookery from 2008-11, Carter Tract of Econfina Creek WMA, Washington County, Florida.

Eighteen cattle egret nests were recorded in 2008. With no sightings in the previous two years, 12 cattle egret nests produced ≥ 24 chicks in spring 2011. Most cattle egret nests were difficult to observe because of their location within rookery shrubs and height above the water level. Therefore, most clutch sizes were undetermined, but presuming all nests contained three eggs (average clutch size; Rodgers, Jr., 1987), successful fledging rate for cattle egrets was 67%. Siblicide is common among egret nestlings as a result of asynchronous egg-laying/incubation and subsequent hatching (Mock, 1987). Larger, older chicks will eliminate the smallest, youngest chick to decrease competition for food provided byadults. Therefore, a fledging rate of 67% or less is not uncommon in egret broods.

Additional species observed in/around Little Deep Edge Pond during 2011 rookery surveys included anhinga (*Anhinga anhinga)*, osprey (*Pandion haliaetus)*, white ibis (*Eudocimus albus)*, wood duck (*Aix sponsa)*, wood stork (*Mycteria americana*), and snowy egret (*Egretta thula*). A tabular summary of wading birds observed by year at the Little Deep Edge Pond rookery can be found in Appendix IX.

Passerines

Annual point count breeding bird surveys are conducted on the Carter Tract. Point count surveys document bird species presence, and can be used to calculate relative abundance among habitat types (Bibby et al., 1992). Point count surveys are most effective during the breeding season, when calling activity is at its peak (Hamel et al., 1996). Survey locations are distributed among the different habitat types as follows: sandhill habitat (Points 2, 6 and 7), wetland/wading bird rookery (Point 1), lake edge (Point 8), wet prairie (Point 4), mixed-hardwood forest (Point 3), and early successional grassland habitat (Point 5) that was clearcut in 2007 (Figure 36). Except for Point 3, all locations have undergone significant habitat enhancement and restoration efforts. Point count surveys will continue annually to identify changes in species composition as a result of these habitat improvements. Point counts were conducted from May 3-6, 2011. Protocol followed was consistent with those used in previous years, and closely follow procedures outlined in Hamel et al. (1996). Surveys were conducted in the early

morning, when bird activity is typically highest (Hostetler and Martin, 2001), with counts beginning at dawn and ending by 0830. The order in which each count location was visited was alternated among the four survey days. This was done to ensure that counts were conducted in early-, mid-, and late-morning periods for each location, thus accounting for any bias from birds potentially calling more frequently at certain hours during the count period (Hostetler and Martin, 2001). Following arrival at each count location, observers refrained from movement or sound for two minutes prior to the start of the count. Count duration was ten minutes, during which time all birds seen and/or heard within a 75-meter radius were recorded. Birds observed/heard outside of the 75-meter plot were also noted. Only birds positively identified were listed by species; other birds seen and/or heard were marked as "unknown", with distinct plumage characteristics or call patterns noted for later identification.

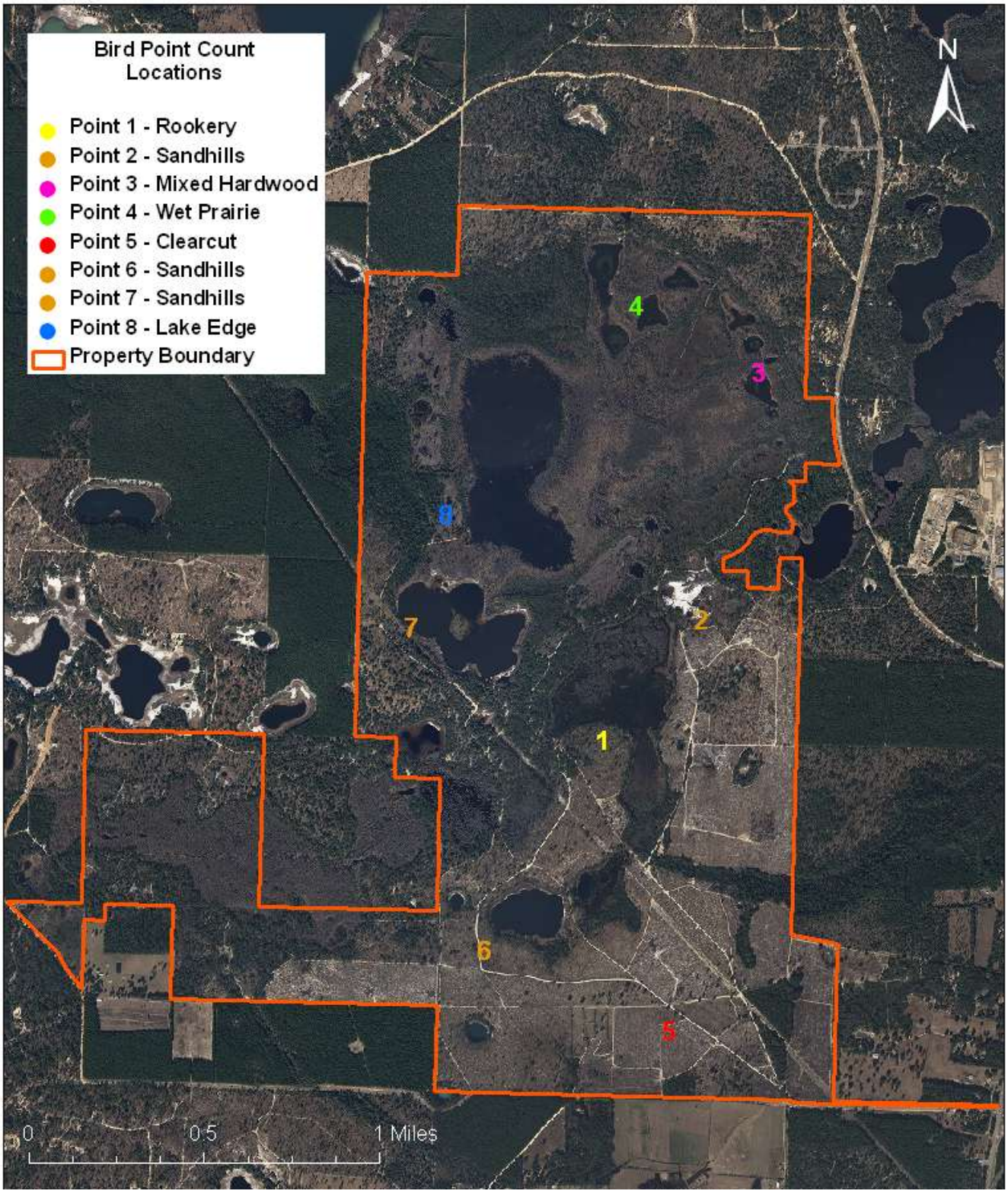

Figure 36. Location of point count surveys conducted during May 2011 on the Carter Tract of Econfina Creek WMA, Washington County, Florida.

The three sandhill point count locations chosen were spatially distinct to represent the entire area of the Carter Tract and were similar in vegetative composition (tree stem density and plant species). The most common avian species identified were the cedar waxwing (*Bombycilla cedrorum*), tufted titmouse (*Baeolophus bicolor*), red-bellied woodpecker (*Melanerpes carolinus*), and eastern towhee (*Pipilo erythrophthalmus*) (Figure 37). This is a shift from ubiquitous species that have been more common in previous years, such as the eastern kingbird (*Tyrannus tyrannus*), mourning dove (*Zenaida macroura*), and great-crested flycatcher. Less common species of note that were observed foraging in the relatively sparse mature live oaks included the red-eyed vireo (*Vireo olivaceus*) and yellow-billed cuckoo (*Coccyzus americanus*). Brown-headed nuthatches (*Sitta pusilla*) were also documented in mature pines. Because of its restricted range, dependence on mature pine-savannah habitats, and declining population trend in Florida since 1966 (Sauer et. al., 2008), the brown-headed nuthatch is a species of high conservation importance (U.S. Fish and Wildlife Service, 2008). Finally, two grassland species that were documented were the Northern bobwhite and prairie warbler (*Dendroica discolor*). The praire warbler was documented just outside of a survey plot, but is a new species for the area and its presence suggests that management acitivies designed to control hardwoods and promote herbaceous groundcover (i.e. herbicide and prescribed burning) are beginning to attract habitat specialists to the property.

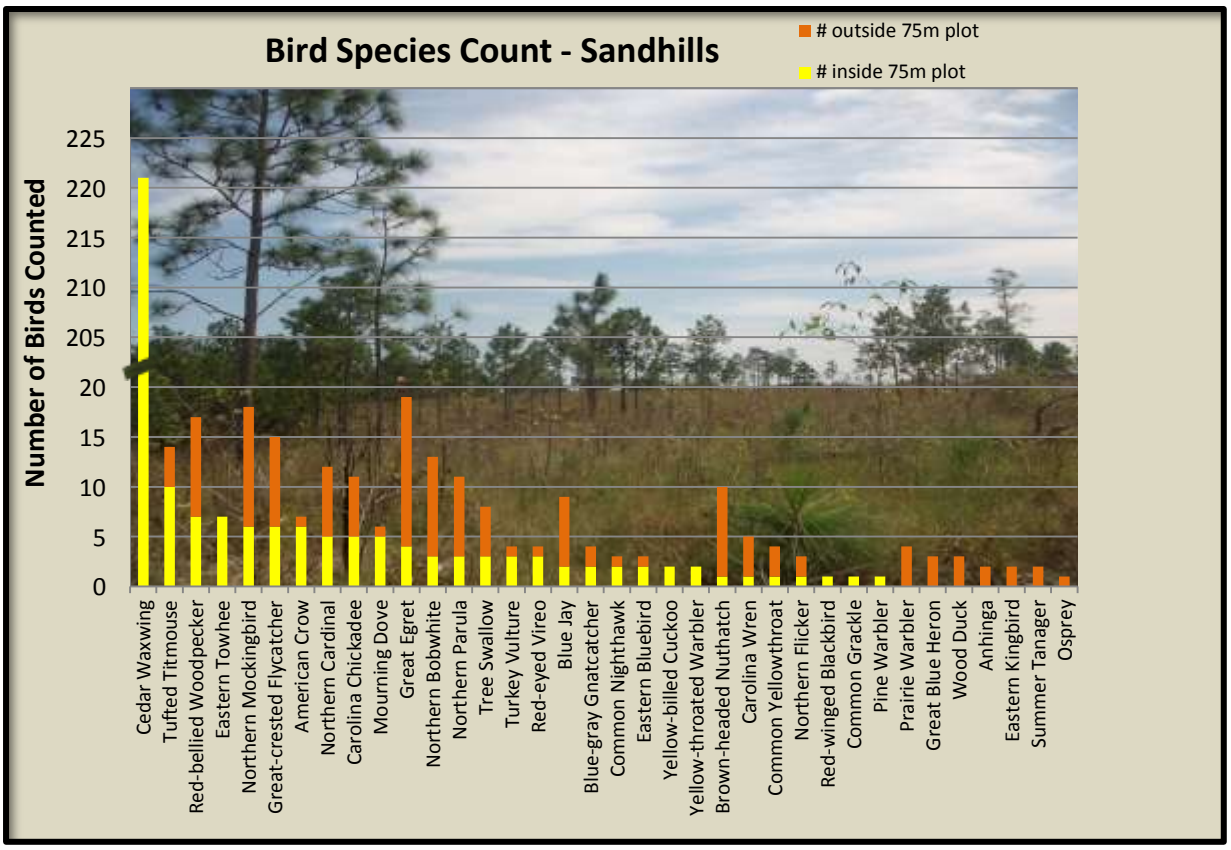

Figure 37. Bird species abundance in sandhill habitats during May 2011 point counts on the Carter Tract of Econfina Creek WMA, Washington County, Florida.

The wetland point count location contains a mixture of open water and freshwater marsh, with a transition zone of emergent aquatic vegetation and shrubs merging with a steep-sloped hardwood hammock adjacent to sandhill uplands. The wading bird rookery on Little Deep Edge Pond is just outside this point count. Red-winged blackbirds (*Agelaius phoeniceus*) and common grackles (*Quiscalus quiscula*) were the most common species observed (Figure 38). Northern parulas (*Parula americana*), blue-gray gnatcatchers (*Polioptila caerulea*), white-eyed vireos (*Vireo griseus*) and eastern bluebirds (*Sialia sialis*) were identified utilizing the hardwood hammock transition zone.

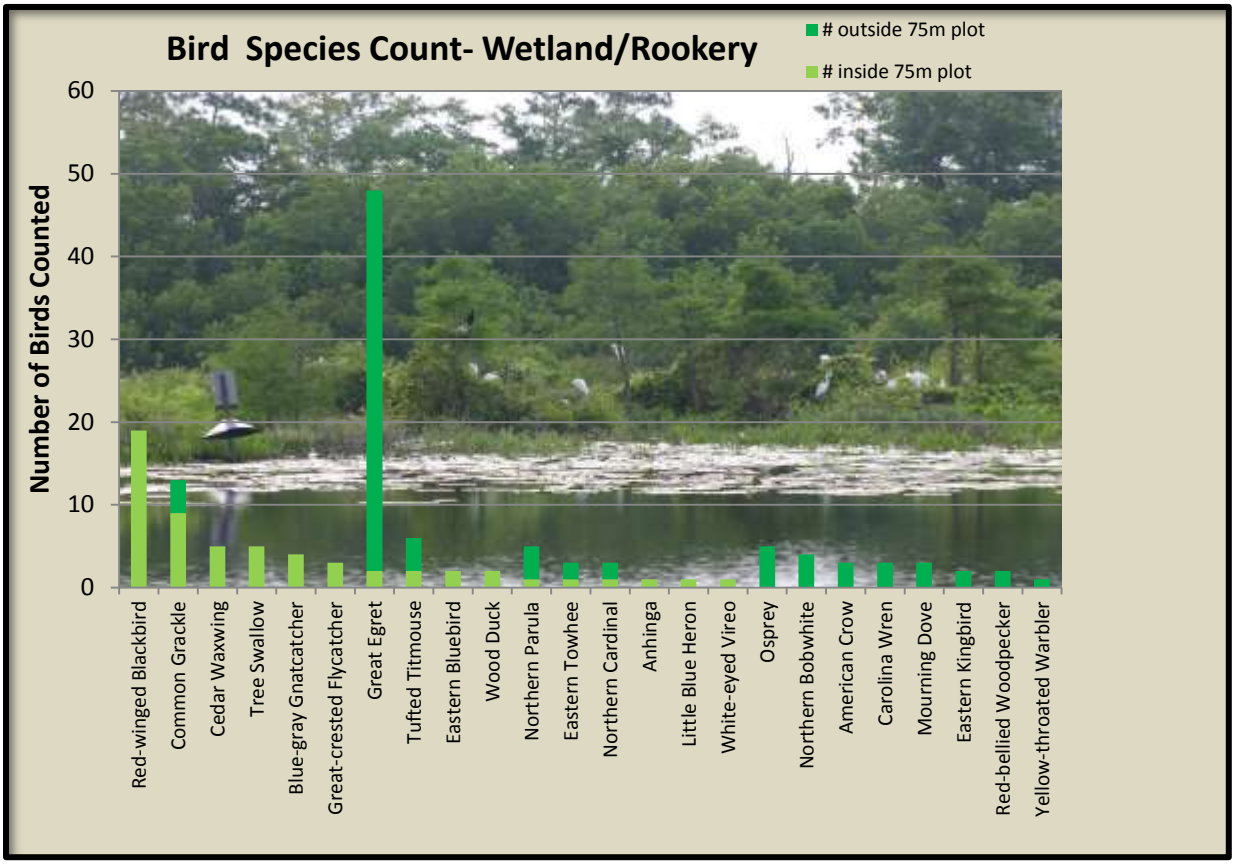

Figure 38. Bird species abundance in wetland/rookery habitat during May 2011 point counts on the Carter Tract of Econfina Creek WMA, Washington County, Florida.

The lake edge point count location is made up of a large body of open water (Dry Pond), and shrubby transition zone leading to hydric pine on one side and mixed wetland hardwoods on the other. This count therefore yields species found in both aquatic and upland habitat types. The most common species identified were the great-crested flycatcher and wood duck, followed by red-winged blackbird, eastern towhee, and common grackle (Figure 39). Common warbler species observed at this location inlcuded northern parula, yellow-throated warbler (*Dendroica dominica*), and pine warbler (*Dendroica pinus*). Primary cavity nesters (i.e. woodpeckers) utilizing standing dead pine trees within this point count included the red-bellied woodpecker, northern flicker (*Colaptes auratus*), and red-headed woodpecker (*Melanerpes erythrocephalus*). Secondary cavity nesters observed utilizing woodpecker-created cavitites included brown-headed nuthatches, eastern bluebirds, and Carolina chickadees (*Poecile carolinensis*).

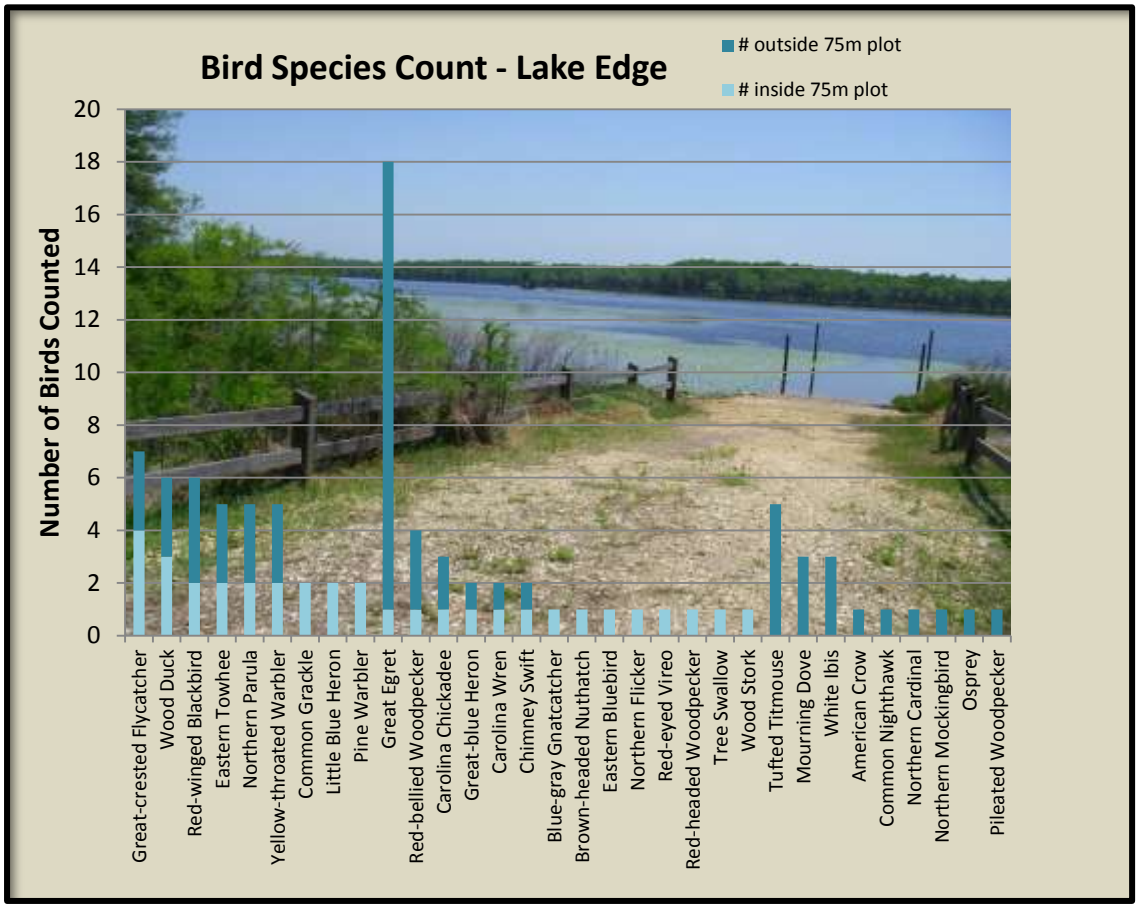

Figure 39. Bird species abundance in lake edge habitat during May 2011 point counts on the Carter Tract of Econfina Creek WMA, Washington County, Florida.

The wet prairie point count location is positioned adjacent to the cypress swamp connecting Dry and Green Ponds. The most common species identified were the wood duck and wood stork, followed by great-crested flycatcher and white ibis (Figure 40). Yellow-throated warblers, blue-gray gnatcatchers, and common grackles were fairly common. The documentation of wood storks and white ibis on the property is signficant because they are a federally endangered species and SSC, respectively (Figure 41). Wood storks are known to forage (almost exclusively on small fish) in shallow wetland depressions where fish tend to become concentrated (Rodgers, Jr. et. al., 1996). Drought conditions that began in May 2011may have concentrated prey for foraging wood storks. Wood storks require sites with sufficiently long annual hydroperiods or strong hydrological connections to permanent water bodies to maintain fish densities (Rodgers, Jr. et. al., 1996). Smaller wetlands, or those with insufficient hydrological connectivity, are often susceptible to landuse conversion. Similarly, drainage, degradation, and manipulation of wetlands over the last 25 years have resulted in significant declines in foraging and breeding habitat of the white ibis (Rodgers, Jr. et al., 1996). As a conservation property, the Carter Tract may therefore provide important foraging grounds for wood storks and white ibis.

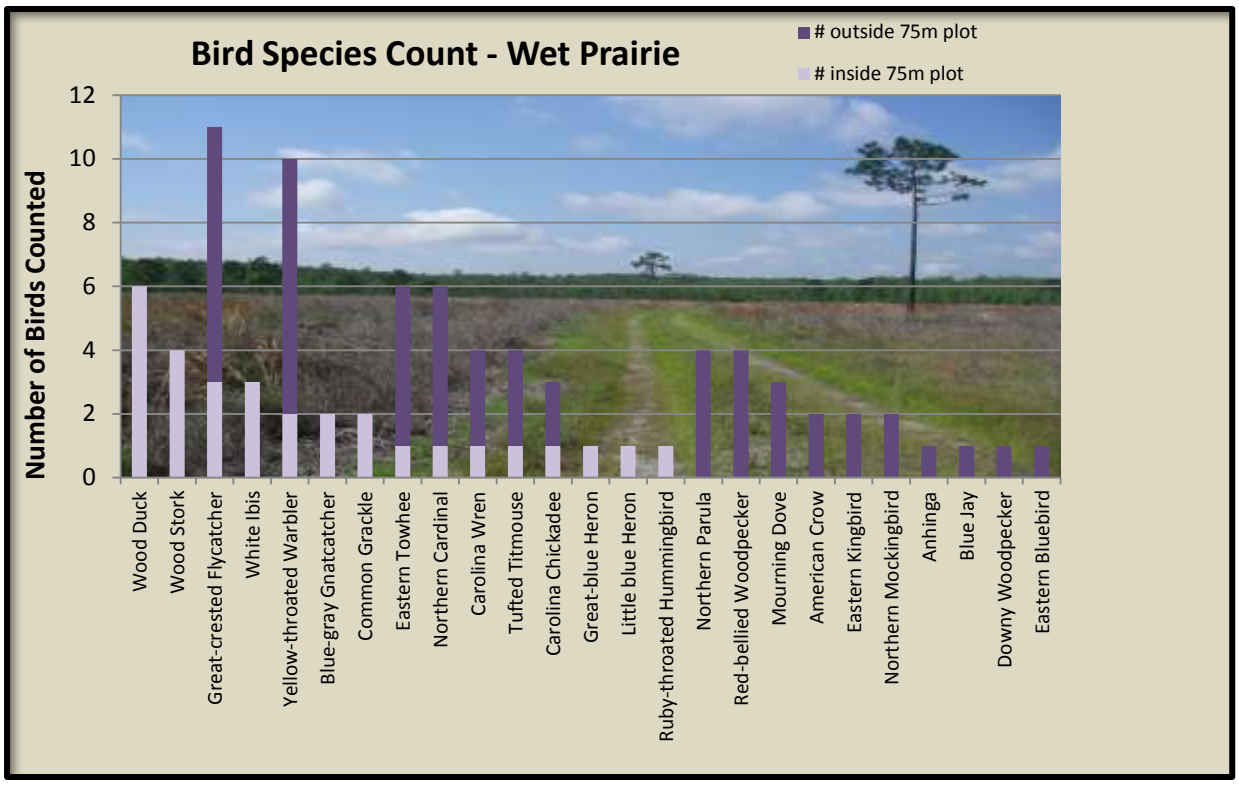

Figure 40. Bird species abundance in wet prairie habitat during May 2011 point counts on the Carter Tract of Econfina Creek WMA, Washington County, Florida.

Figure 41. Wood stork (*Mycteria americana*; left) and white ibis (*Eudocimus albus*; right) observed on Carter Tract water bodies during spring/summer 2011.

The mixed hardwood point count location is dominated by live oaks, bays, and holly trees that provide a mostly closed canopy. The Northern parula, cedar waxwing, Carolina wren, and blue-gray gnatcatcher were the most common species documented at this location (Figure 42). Three of the four most common species documented at this point did not change between 2010 and 2011 surveys. This is likely because the habitat has not been altered in the way that the other point count locations thoughout the property have.

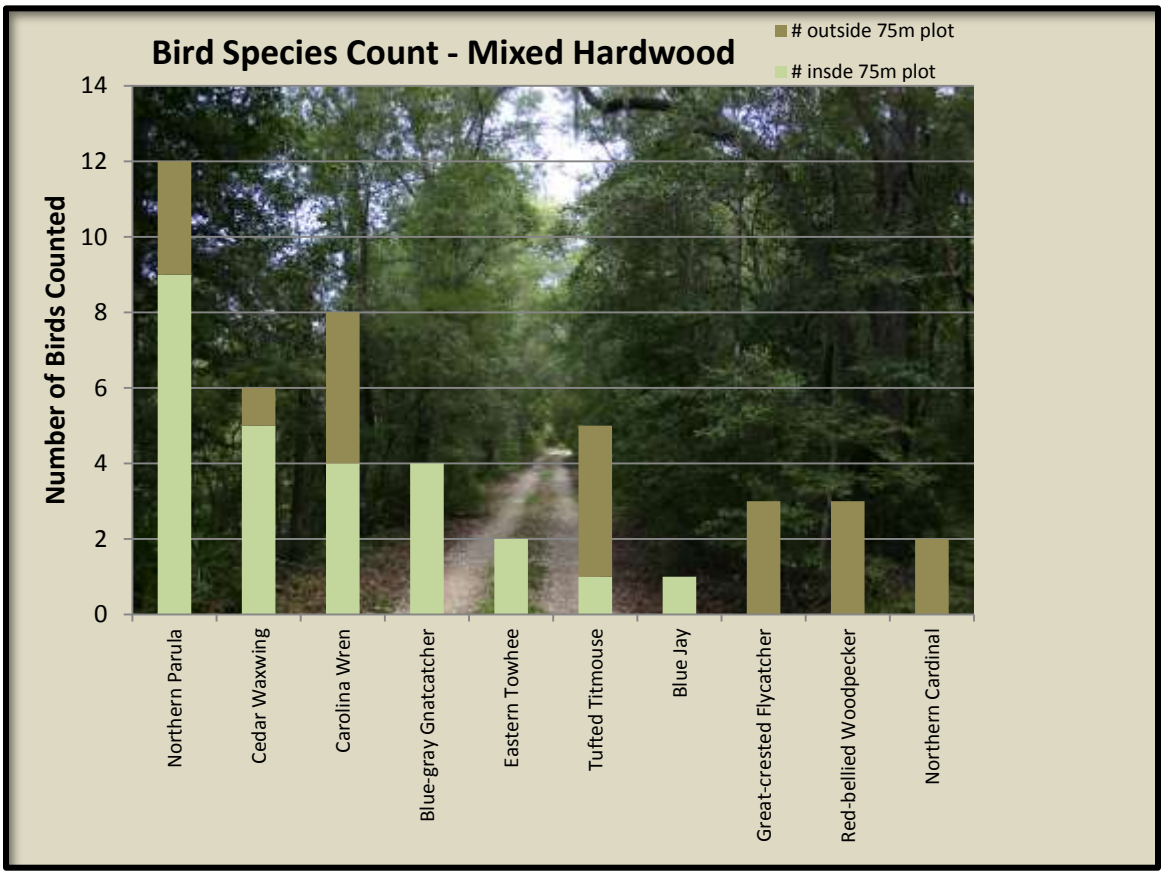

Figure 42. Bird species abundance in mixed hardwood forest habitat during May 2011 point counts on the Carter Tract of Econfina Creek WMA, Washington County, Florida.

The grassland point count location is a former pine plantation that was clearcut in 2007. Current vegetative composition in this area is typical of early successional habitat types, consisting primarily of *Hypericum* sp., foxglove beardtongue (*Penstemon digitalis*), *Lespedeza* sp., wiregrass, broomsedge (*Andropogon virginicus*), and persimmon (*Diospyros virginiana*). The northern mockingbird (*Mimus polyglottos*) and mourning dove were the most common species counted at this location (Figure 43). Tufted titmouse, Northern bobwhite, Eastern kingbird, Northern Flicker, and loggerhead shrike (*Lanius ludovicianus*) were also documented but less abundant. It is likely that the bird community at this grassland site will continue to evolve in subsequent years as native groundcover becomes established with frequent prescribed fireand longleaf pine seedlings mature.

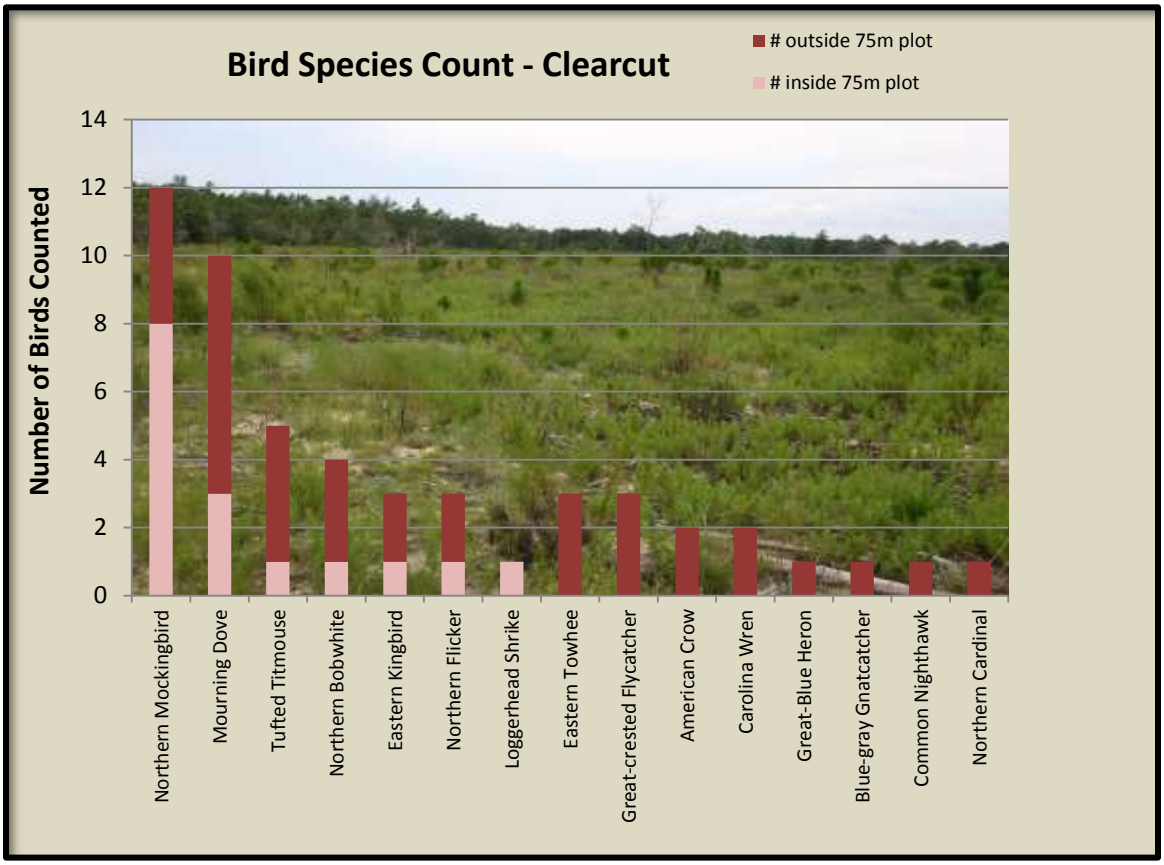

Figure 43. Bird species abundance in clearcut/grassland habitat during May 2011 point counts on the Carter Tract of Econfina Creek WMA, Washington County, Florida.

Spring 2011 point counts documented several species not previously observed during our formalized surveys. In sandhill habitats, prairie warblers were recorded. In wetland and wet prairie point counts, wood storks and white ibis were observed. Tree swallows and cedar waxwings were identified in three of the six habitat types surveyed. It is encouraging to see the presence of new species utilizing different habitat types on the Carter Tract and is a testament to the success of habitat restoration efforts on the property to date. As restoration and scheduled management activities continue, further species diversification is expected as additional habitat specialists utilize preferred habitat types.

Bluebird Boxes

Worldwide bird species diversity continues to decline each year due to habitat fragmentation, development, and degradation. For secondary cavity nesters like the eastern bluebird, this regression has typically been attributed to a decline in available nesting cavities. Further, changing agricultural and silvicultural practices have led to snag removal and replacement of wood fence posts by treated wood or steel posts (Conner, 1974). Since bluebirds are secondary cavity nesters, they rely on primary excavators (i.e. woodpeckers) and natural forces to create suitable cavities for nesting. Competition for cavities has also increased due to growing populations of introduced species such as the European starling (*Sturnus vulgaris*) and house sparrow (*Passer domesticus*). When natural cavities become scarce, nest boxes become important supplementary nesting sites.

During January 2011, efforts were launched to monitor local breeding populations of eastern bluebirds on the Carter Tract. Eighteen nest boxes werefastened to existing fence or sign posts roughly 3.5 – 5 feet off the ground and were oriented on a south/southeast bearing (Figure 44). Boxes were installed throughout the property in locations with open grassy habitat and were located a minimum of 100 yards from the next closest box (Figure 45). Bluebird nest boxes were checked every ten days throughout the breeding season (April – July) to determine occupancy and nest fate. Box construction, installation, and monitoring followed protocol outlined by the U.S. Geologic Survey (USGS) online resources (2006).

Figure 44. Bluebird box erected to monitor local populations of eastern bluebirds on the Carter Tract of Econfina Creek WMA, Washington County, Florida.

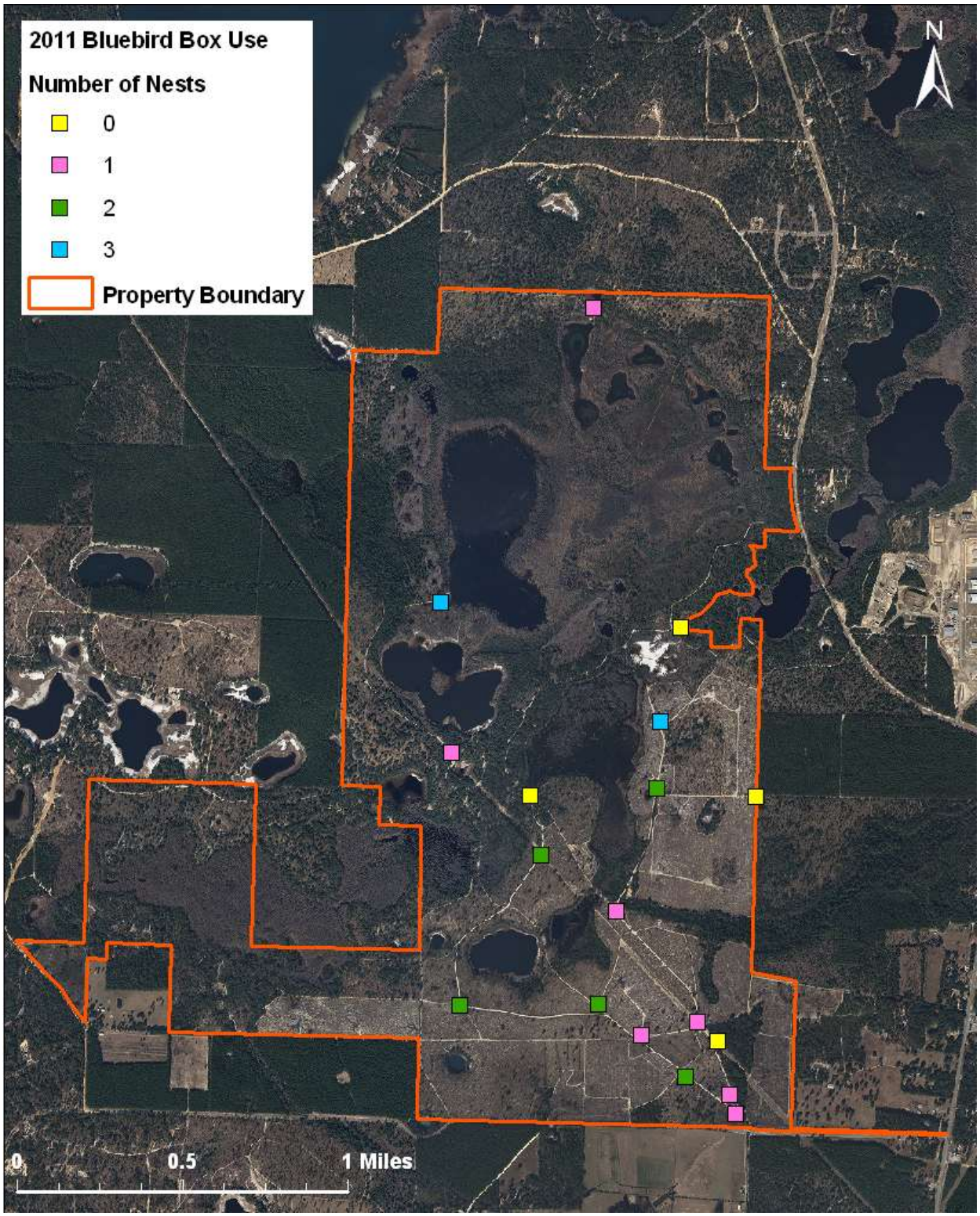

Figure 45. Location and use of bluebird nest boxes from April – July 2011 on the Carter Tract of Econfina Creek WMA, Washington County, Florida.

Eastern bluebirds and Carolina chickadees utilized 14 of 18 newly-installed nest boxes (Figure 46). Bluebirds constructed 18 nests, layed an average of 4.3 eggs/clutch, and fledged 15 total chicks (Table 5). Chickadees built five nests, layed an average of 4.2 eggs/clutch, and fledged six chicks. Fledging success rate (number of fledged chicks/total number of eggs produced) was 19.2% and 28.6% for bluebirds and chickadees, respectively. Ten nests appeared to have been predated. Predator guards were not used so boxes could be installed directly on existing fence/sign posts, which is a common method of mounting/installation. Brawn (1985, 1987) found similar predation rates between unprotected western bluebird (*Sialia mexicana*) boxes and natural cavities. Our survey and monitoring of these nest boxes in subsequent years will determine whether predator guards should be installed.

Figure 46. Eastern bluebird nest (left) and carolina chickadee nest (right) found inside bluebird nest boxes on the Carter Tract of Econfina Creek WMA, Washington County, Florida.

Table 5. Bluebird box occupancy, egg success, and nest success on the Carter Tract of Econfina Creek WMA, Washington County, Florida, April – August 2011.

Species	Total nests	Nests with young	Total eggs	Avg. clutch size	Total chicks	Fledged chicks	Fledging success
Carolina chickadee	5	3	21	4.2	12	6	28.6%
Eastern Bluebird	18	8	78	4.3	22	15	19.2%

Kestrel Boxes

The southeastern American kestrel (*Falco sparverius paulus*) is a subspecies of the American kestrel (*Falco sparverius sparverius*) found in open pine habitats, woodland edges, prairies, and pastures, with a preference for sandhill habitats. The smallest falcon in the U.S., and a threatened species in the state of Florida, the southeastern American kestrel relies on suitable cavity trees as a key habitat feature necessary for breeding (Rodgers, Jr. et al., 1996). However, because kestrels are secondary cavity nesters, suitable nest sites is thought to be the most limiting factor and a major contributor to declining populations in Florida (Hoffman and Collopy, 1988). The decline of natural nesting and foraging habitats in recent years has prompted the use of nest-box programs to help augment populations. Kestrel boxes can also provide important winter cover for other avian species, such as the eastern screech owl (Hipes et al., 2001; U.S. Department of Agriculture, 1999).

FWC staff have observed kestrels at the Carter Tract during previous winters. However, it is unknown whether the birds are migratory/wintering American kestrels or resident southeastern American kestrels. Although southeastern American kestrels are slightly smaller than American kestrels, the two species cannot be reliably distinguished in the field. Because the southeastern American kestrel is the only subspecies of kestrel that breeds in Florida, erecting nest boxes is one method of determining which species is present on the Carter Tract. Therefore, in February 2011 eight nest boxes were installed throughout the Carter Tract following protocol outlined by the U.S. Department of Agriculture (USDA) (1999; Figure 47).

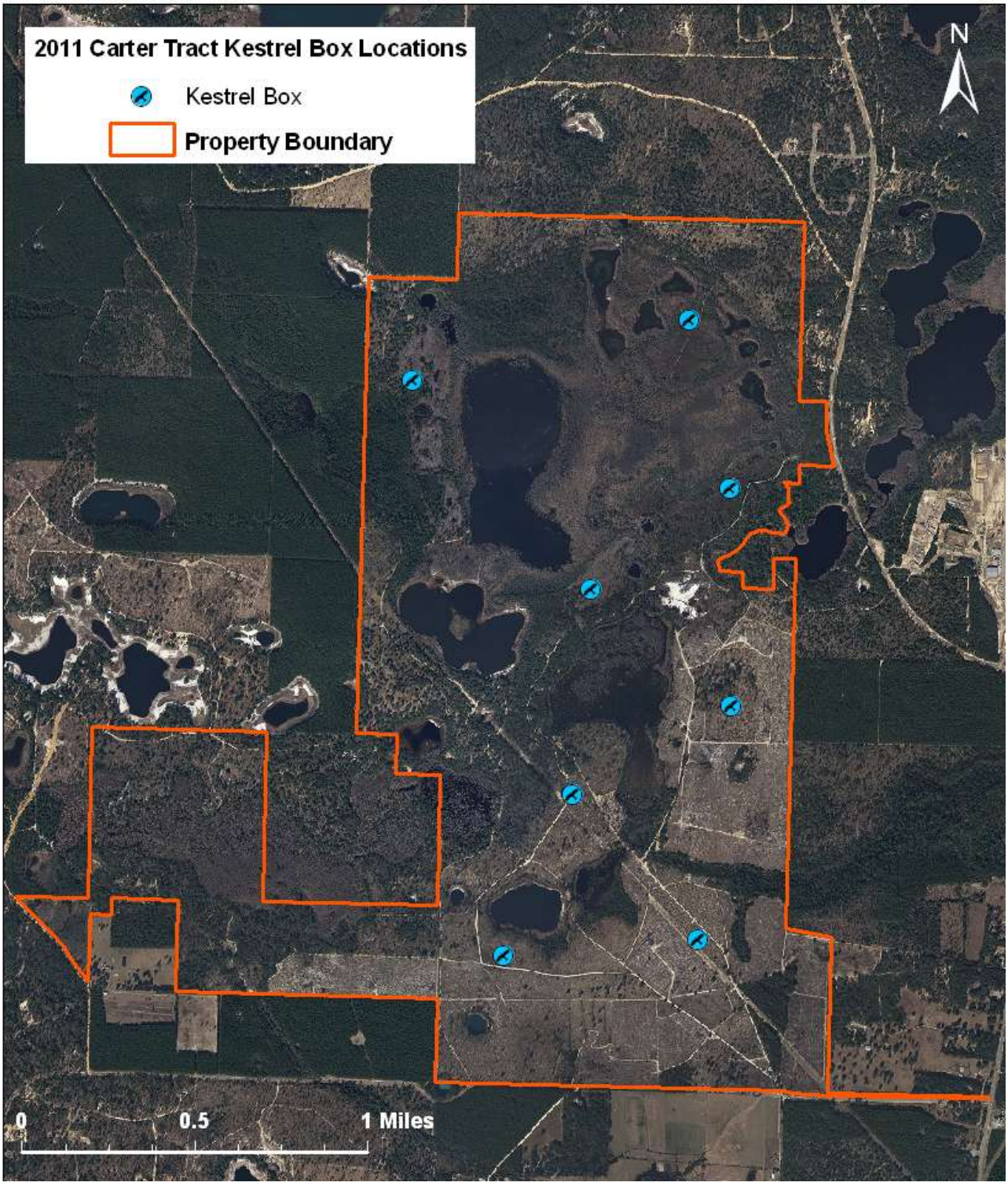

Figure 47. Location of Kestrel nest boxes at the Carter Tract of Econfina Creek WMA, Washington County, Florida.

Nest boxes were installed on mature longleaf pine trees, approximately 15 feet from the ground facing a southeast orientation. Trees chosen were those in open areas, far enough away from surrounding trees to discourage squirrels from accessing nest boxes. Boxes were located at least ½-milefrom the next nearest nest box. Boxes were filled with cedar shavings as nesting material. Aluminum flashing was wrapped around the base of trees to discourage rat snake predation (Figure 48). Nest box monitoring followed protocol outlined by FWC's Fish and Wildlife Research Institute .

Figure 48. Kestrel nest box installed on a longleaf pine tree at the Carter Tract of Econfina Creek WMA, Washington County, Florida.

No kestrel nests were recorded during spring 2011. However, eastern bluebirds, great-crested flycatchers, Northern flickers, and flying squirrels were documented using nest boxes. Because nest boxes were not installed until late Feburary 2011, it is possible that kestrels utilizing the Carter Tract had already established territories. Therefore, kestrel boxes will be monitored again during the 2012 nesting season (February – June).

Quail Covey Call Counts

Determining autumn density of northern bobwhite populations can be important for estimating population responses to land management actvities. Upland habitat restoration activities on the Carter Tract (i.e. establishement of an herbaceous understory, hardwood control, establishment of a 2-3 year prescribed burn rotation) benefit bobwhite populations by providing the right combination of bare ground (for foraging) and herbaceous cover (for nesting and brooding). On areas with extremely low autumn densities (<1 bobwhite/25 acres or 1 covey/300 acres) early morning covey call counts may be the only realistic survey technique. Because a calling covey in the earlly morning will stimulate other coveys to call, a good technique when surveying low density areas is to stimulate calling by broadcasting taped recordings of covey calls (Wellendorf et al., 2004).

Covey call counts were performed at the Carter Tract November 1 – 11, 2010. Nine call count stations were established throughout the property, with survey locations chosen based on habitat, incidental observations of bobwhite activity on the property, and adherence to a 500-meter buffer zone beween count stations (Figure 49). Surveys began approximately 30 minutes prior to official sunrise and generally lasted one hour. A pre-recorded calling sequence was downloaded to an mp3 player and projected through portable speakers. The call was played for ten second loops with one minute breaks in between loops to listen for response calls. This iteration process was repeated until approximately 30 minutes after sunrise, and the speaker was rotated 360 degrees to project the call in all directions. The relative locations of coveys within the 500-meter survey station (Appendix X) were noted during the survey and attempts were made at the end of the survey to flush each covey to count the number of birds. Surveys were performed on mornings with the following weather conditions: wind speed less than eight miles/hour, cloud cover less than 75%, barometric pressure had not dropped >0.05 inches/Hg in the six hours prior to the survey, and no rain.

Covey call counts during November 2010 resulted in response of two coveys to call stimulation recordings. Both coveys were heard on two separate mornings within covey call station number four (CC4 on Figure 49). One of the two coveys was successfully flushed and found to be made up of five birds. The primary purpose of covey call counts

on the Carter Tract is to monitor bobwhite population trends as restoration activies continue to improve habitat quality across the property. Anectdotal observations by FWC staff and hunter reports suggest that the two confirmed coveys is a low estimate of the number of coveys within the property. Therefore covey call counts will be performed each autumn to improve covey density estimates and track population trends over time.

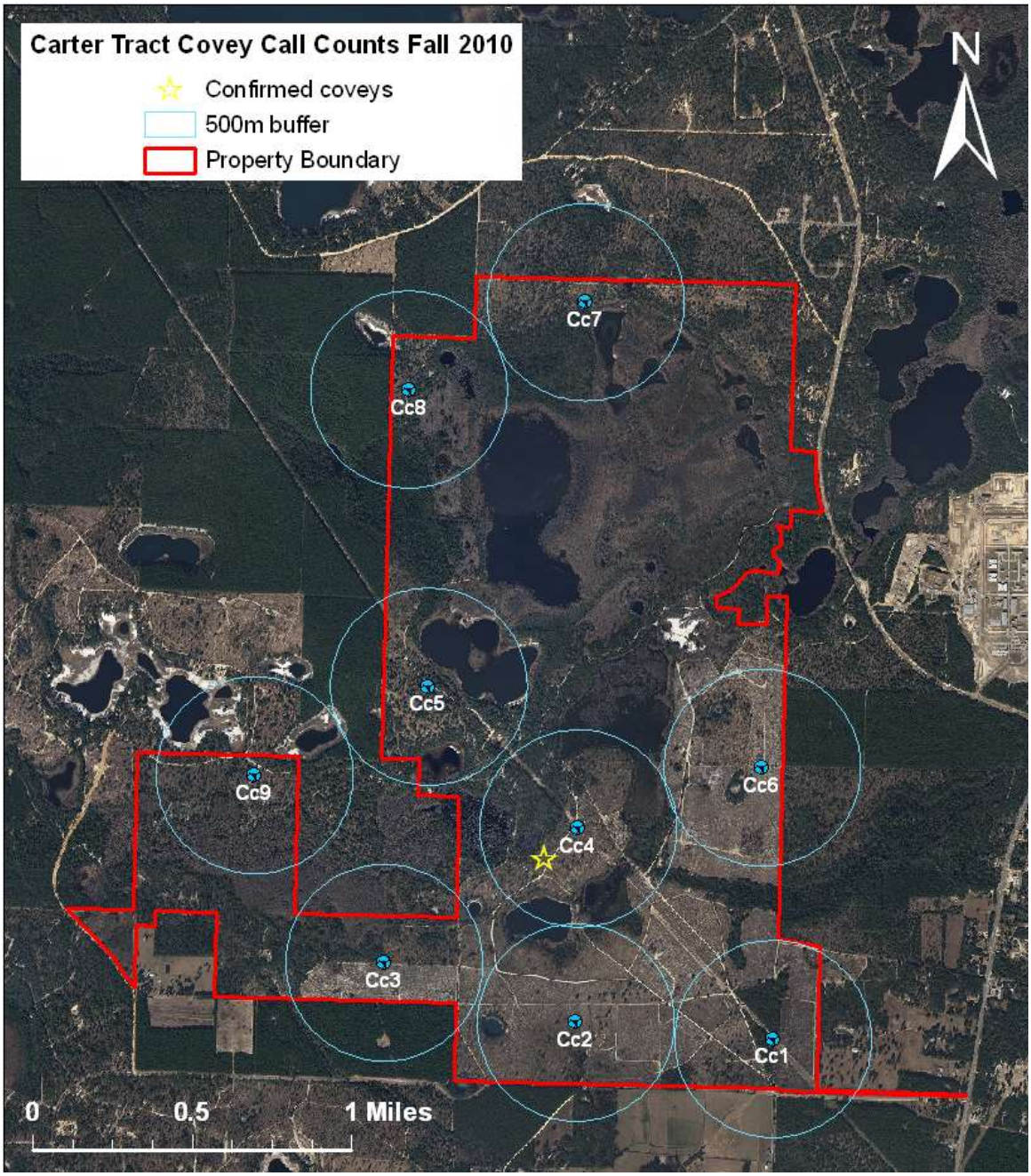

Figure 49. Locations of bobwhite covey call count surveys conducted November 2010 at the Carter Tract of Econfina Creek WMA, Washington County, Florida.

Mourning Dove Banding

Contemporary and statistically reliable estimates of harvest rates, survival rates, and geographical distribution and derivation of harvest throughout the United States are necessary to improve science-based harvest management of mourning doves. A three year national pilot banding program was initiated in 2003 to produce data for estimation of these demographic parameters. This cooperative effort between state wildlife agencies, the U.S. Fish and Wildlife Service (USFWS), and the U.S. Geological Survey Bird Banding Laboratory (BBL) resulted in much needed information for improvement of dove harvest management. The pilot study represented the only source of contemporary information available on a large-scale basis (26 states), as the last comprehensive banding program occurred from 1965-1975. Goals and objectives of this study included:

- Estimate age-specific harvest rates and band reporting rates in a representative set of sub-regions in each of the three national dove harvest management units
- Estimate band reporting rates with the same subregions
- Establish protocols, training, and cost estimates for a future coordinated nationwide banding program designed to monitor harvest and survival rates
- Provide information on geographical distribution and derivation of harvest
- Provide initial estimates of annual survival and breeding site fidelity of subregion breeding populations

The field protocols and sampling designs used and tested by the cooperating state agency field staffs, and the resultant parameter estimates generated from this pilot study, were critical in the design of a cooperative state and federal long-term operational banding program. As part of this national long-term banding program, FWC's Small Game Management Program solicited WMAs throughout the state to participate in this banding work. FWC on the Carter Tract has chosen to participate and contribute to Florida's statewide dove-banding project in cooperation with the USFWS and BBL (Figure 50). These efforts are integral components in the development and implementation of a long term national harvest management strategy for mourning doves. Hunters play an important role in the success of the program and are encouraged to report leg bands at 1-800-327-BAND, or online at www.pwrc.usgs.gov (select "Birds", then

"Bird Banding Lab"). Interestingly, according to 2003-2010 mourning dove band returns (n=301), 85% of doves harvested in Florida originated in Florida (Kurt Hodges, FWC, pers. comm.).

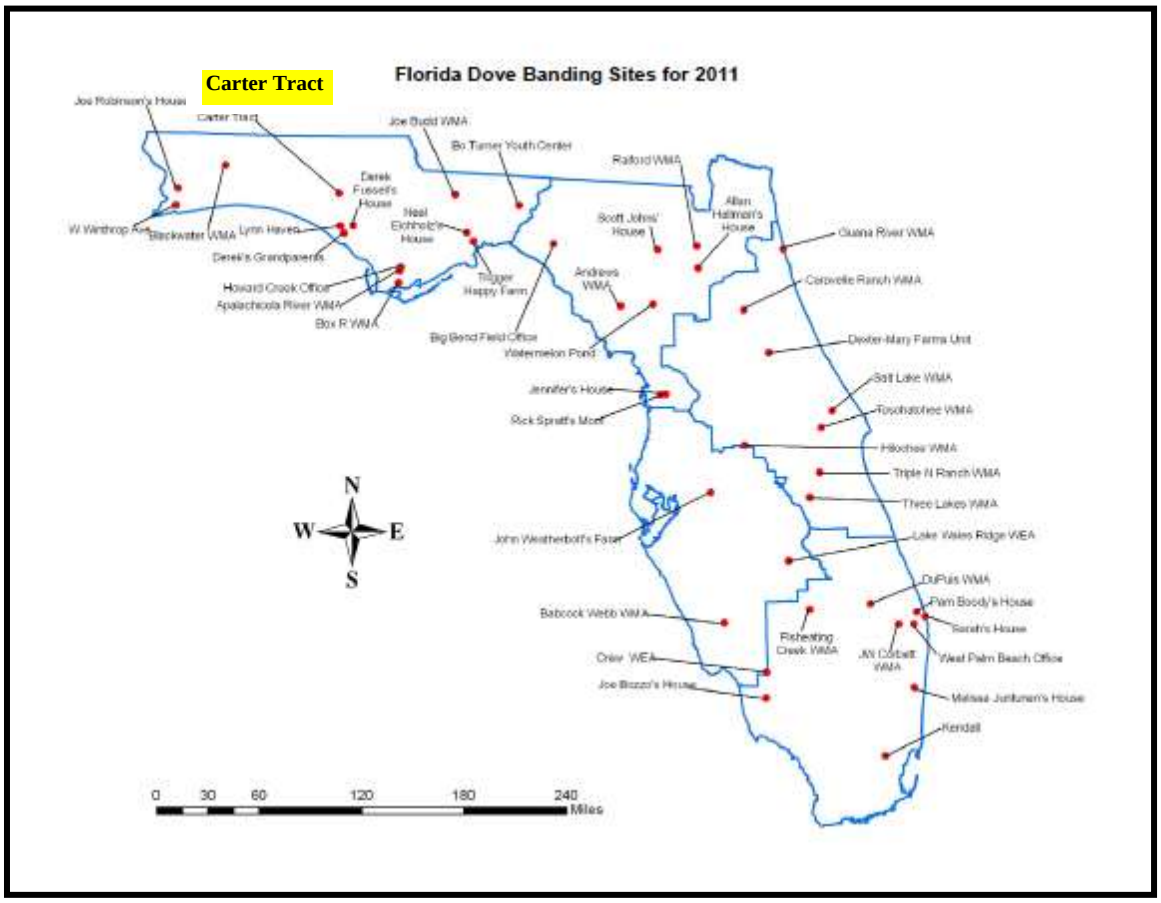

Figure 50. In conjunction with national long-term banding efforts, the Carter Tract of Econfina Creek WMA in Washington County, Florida is one of the sites participating in Florida's statewide dove banding program.

Two sites on the Carter Tract were prebaited with white millet seed in June 2010, prior to trapping. Trapping was conducted beginning July 1, 2010 with traps set in the early morning and late afternoon. Traps were checked after 1-2 hours, depending on weather conditions. Doves were banded using U.S. Fish and Wildlife Service metal identification bands, and age (AHY= after hatch year; HY = hatch year), sex, and molt sequence data were collected for each bird (Figure 51). Twenty-five mourning doves (13 AHY; 11 HY; 1 unknown) were successfully banded during the 2010 capture/banding effort, and there were no recaptures of birds banded in previous years.

Figure 51. Mourning doves were trapped, banded with U.S. Fish and Wildlife identification tags, and age, sex, and molt sequence were recorded in July 2010 on the Carter Tract of Econfina Creek WMA, Washington County, Florida.

Herpetofauna

FWC staff employ a host of methods for surveying herpetofauna populations at the Carter Tract, including drift fences, minnow traps, frog tubes, box-style snake traps, pitfall traps, turtle hoop traps, and incidental observations. A comprehensive list of all herpetofauna species (n=53) identified on the Carter Tract from 2005 to present has been compiled (Appendix XI). Since July 2010, five previously unconfirmed herpetofauna species were identified as occurring on the Carter Tract, bringing the current species count to 33 reptiles and 20 amphibians. Sandhill and scrub habitats, as well as seasonal isolated wetlands and small ponds are among the most important and imperiled habitats for southeastern herpetofauna. Additionally, most amphibians that rely on seasonal wetlands or ponds for reproduction also require upland habitats (Bailey et al., 2006). The Carter Tract is an example of a good mix of both permanent (e.g. Dry Pond) and intermediate (e.g. Pine Log Creek and Garrett Pond) aquatic habitats interspersed with adjacent upland sandhills. The presence of the gopher tortoise (*Gopherus polyphemus*) in the sandhill areas of the tract is significant not only because it is a Threatened species, but also because their burrows are beneficial to a host of commensalistic species that utilize them (both active and abandoned) for shelter and foraging (Jackson and Milstrey, 1989). Specifically, the federally and state Threatened eastern indigo snake (*Drymarchon courais couperi*), in addition to the gopher frog (*Rana capito*) and Florida pine snake,

both SSC, are known to use gopher tortoise burrows (Moler, 1992; Ashton and Ashton, 2008). As in previous years, a detailed report on the *Annual Survey and Monitoring of the Gopher Tortoise on the Carter Tract* will be submitted separate from this comprehensive annual report.

Drift Fences

Nine drift fences were installed parallel to pond margins to intercept adult amphibians and reptiles entering and exiting ponds and wetlands (Figure 52). Drift fences were constructed of 100ft x 3ft silt fencing, supported by wooden stakes and attached with heavy duty staples. The bottom edge of the fence material was buried approximately 6-inches below ground to prevent herpetofauna from burrowing underneath. In the past drift fences were used in conjunction with funnel traps placed at each end and in the middle of both the inside and outside of the fence, for a total of six funnel traps per fence. During 2010-11, however, the four funnel traps at the end of each fence were replaced with 1-gallon plastic buckets that were buried and used as pitfall traps. Bucket bottoms were perforated to allow drainage and prevent inadvertent drowning of captured individuals and were maintained with1-2" of sand to prevent dessication. Two double-ended funnel traps were placed in the middle of the fence on each side for a total of four pitfall buckets and two funnel traps per fence. Funnel traps were constructed from window screening and size and design was modeled after that of Enge (1997). All funnel traps contained a moistened sponge to decrease the threat of dessication for captured animals. The configuration of pitfall buckets and funnnel traps was used to target salamanders and small bodied snakes, respectively.

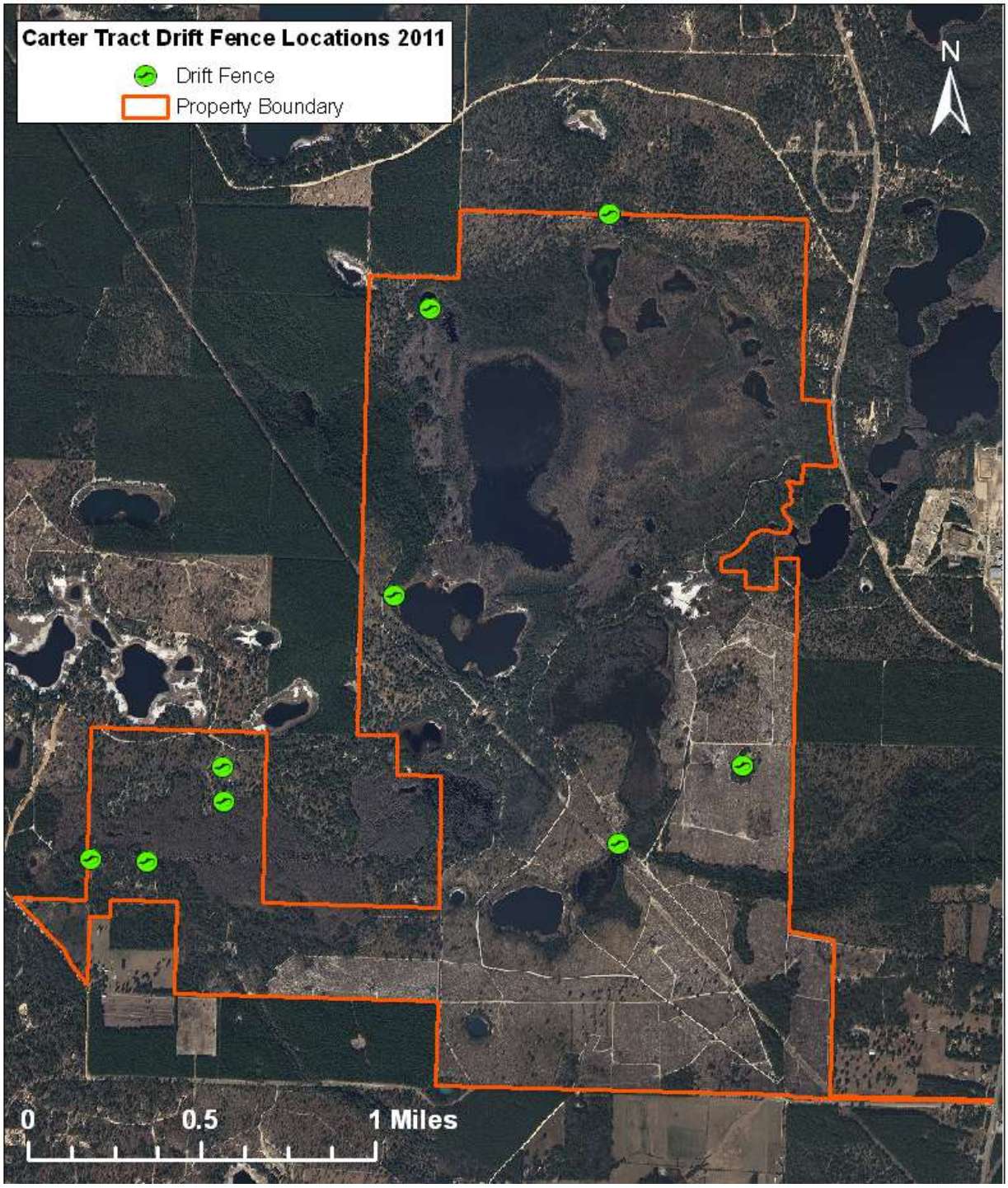

Figure 52. Location of drift fences for herpetofaunal surveys on the Carter Tract of Econfina Creek WMA, Washington County, Florida, 2010-11.

Herpetofauna movements (especially amphibians) are often correlated with rain events (Bury and Corn, 1987). Therefore, drift fence surveys were conducted according to local weather conditions, with traps opened prior to and during rain events when herpetofauna were expected to be moving. Soil ramps were constructed at the mouth of the mesh funnels to act as a natural surface leading into the trap. Traps were checked in the early morning to minimize trap-induced mortality. Twenty-two individual animals representing seven species (six amphibian; 1 reptile) were captured over 119 trap nights between December 2010 – April 2011(Table 6). The mole salamander (*Ambystoma talpoideum*) and eastern spadefoot toad (*Scaphiopus holbrooki*), comprised the majority (73%) of captures.

Table 6. Herpetofauna species captured using drift fences on the Carter Tract of Econfina Creek WMA, Washington County, Florida, January – April 2010.

Species	Number of Captures
Mole salamander (*Ambystoma talpoideum*)	8
Eastern spadefoot (*Scaphiopus holbrooki)*	8
Florida cricket frog (*Acris gryllus dorsalis*)	2
Florida cooter (*Pseudemys floridana floridana*)	1
Eastern narrowmouth toad (*Gastrophryne carolinensis*)	1
Pig frog (*Rana grylio*)	1
Southern toad (*Bufo terrestris*)	1
Total Captures	22

Minnow Traps

Nineteen aquatic minnow traps were used on Carter Tract water bodies from November 2010 – April 2011 (Figure 53). Minnow traps are particularly successful at capturing adult aquatic salamanders and frogs, as well as salamander larvae and tadpoles. However, aquatic snakes, small turtles, fish, and crayfish are also common captures. Minnow traps were placed partially submerged in shallow water at the edges of ponds and wetlands.

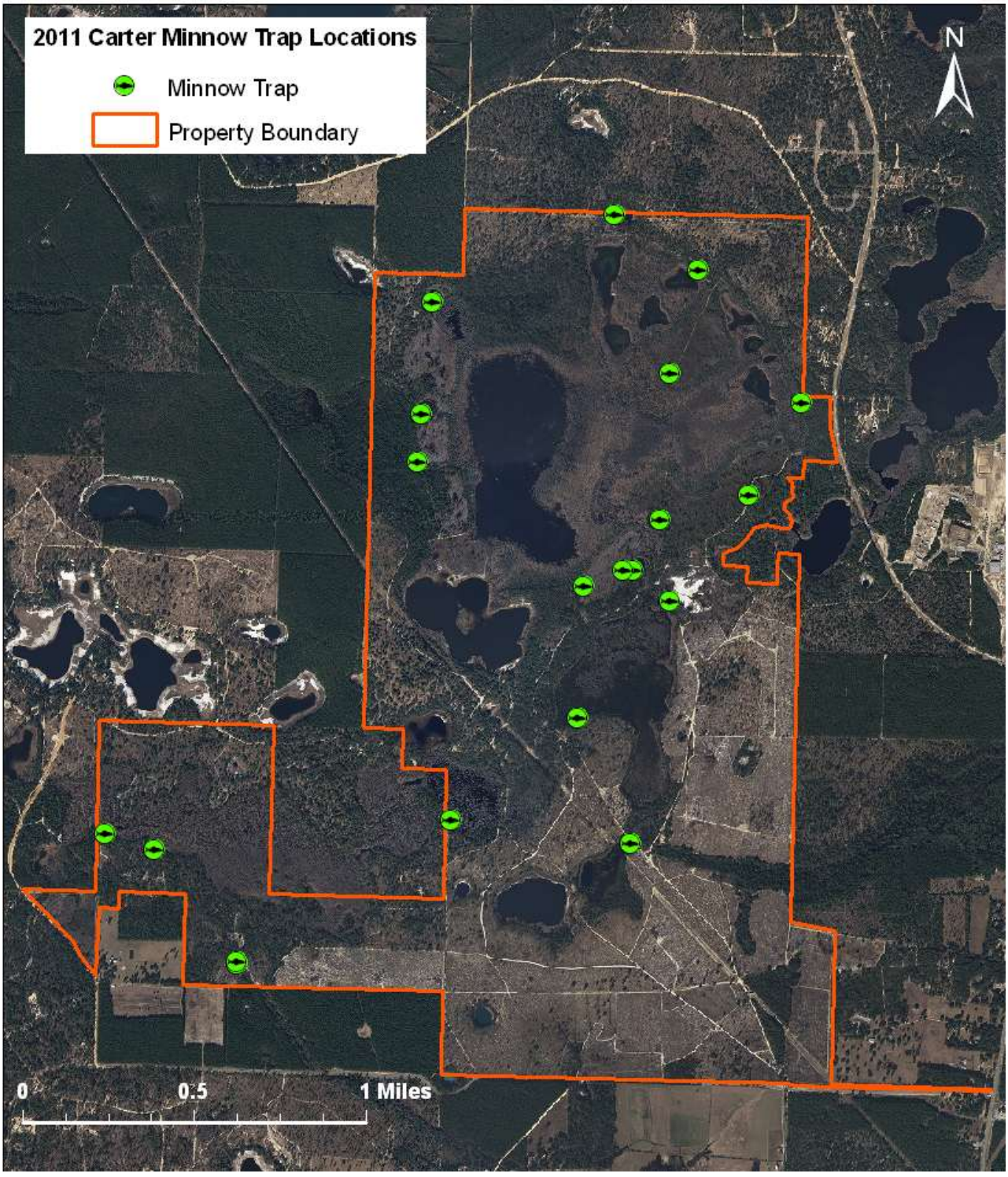

Figure 53. Location of aquatic funnel (minnow) traps used for sampling herpetofauna on the Carter Tract of Econfina Creek WMA, Washington County, Florida, February – April 2010.

Over 2,413 trap nights from December 2010 – April 2011nineteen minnow traps captured 81 individual animals. Fish made up 44% of captures while amphibians comprised 51% of captures (Table 7). The remaining 5% of captures consisted of three crayfish and one musk turtle (*Sternotherus odoratus*). The blue-spotted sunfish (*Enneacanthus gloriosus*) was the most captured fish species (n = 10) while the mole salamander was the most captured amphibian (n = 24).

Table 7. Aquatic funnel (minnow) trap capture results from December 2010 – April 2011 on the Carter Tract of Econfina Creek WMA, Washington County, Florida.

Herpetofauna	**Number of Captures**
Mole salamander (*Ambystoma talpoideum*)	24
Central newt (*Notopthalmus viridescens louisianensis*)	10
Pig frog (*Rana grylio*)	3
Bullfrog (*Rana catesbiana)*	2
Lesser siren (*Siren intermedia*)	1
Musk turtle (*Sternotherus odoratus*)	1
Barking treefrog (*Hyla gratiosa*)	1
TOTAL	42
Fish	**Number of Captures**
Bluespotted sunfish (*Enneacanthus gloriosus*)	10
Warmouth (*Lepomis gulosus*)	8
Dollar sunfish (*Lepomis marinatus*)	7
Chain pickerel (*Esox niger*)	4
Crayfish	3
Pygmy sunfish (*Elassoma* sp.)	2
Swampdarter (*Etheostoma fusiforme*)	2
Black crappie (*Pomoxis nigromaculatus*)	1
Largemouth bass (*Micropterus salmoides*)	1
Flier (*Centrarchus macropterus*)	1
TOTAL	39

Frog Tubes

Twenty-four treefrog tubes were installed across the Carter Tract on trees adjacent to water bodies (Figure 54). Frog tubes were constructed of 1.5-inch diameter PVC tubing, capped on the bottom. Tubes were 24 inches in length and contained a 1/8-inch diameter hole in the side approximately four inches from the bottom to drain excess water. A nylon string attached to the side of the tube on the inside served as an escape mechanism for non-target species. Frog tubes were not installed to assess frog population estimates at the Carter Tract, but rather to serve as a passive survey method for identifying new species. Therefore, frog tubes were not checked on a regular basis, but periodically based on season, ambient temperature, rainfall, etc. Periodic checks from July 2010 – June 2011 did not capture any new frog species, but juvenile green tree frogs (*Hyla cinerea*; Figure 55) were found in tubes near Green Pond 1. Plans are to continue to deploy frog tubes on the Carter Tract in an attempt to confirm the presence of three additional tree frog species. The gray treefrog (*Hyla chrysoscelis/versicolor*), bird-voiced treefrog (*Hyla avivoca*), and pinewoods treefrog (*Hylafemoralis*) have been documented as occurring elsewhere in Washington County, but not on the Carter Tract to date.

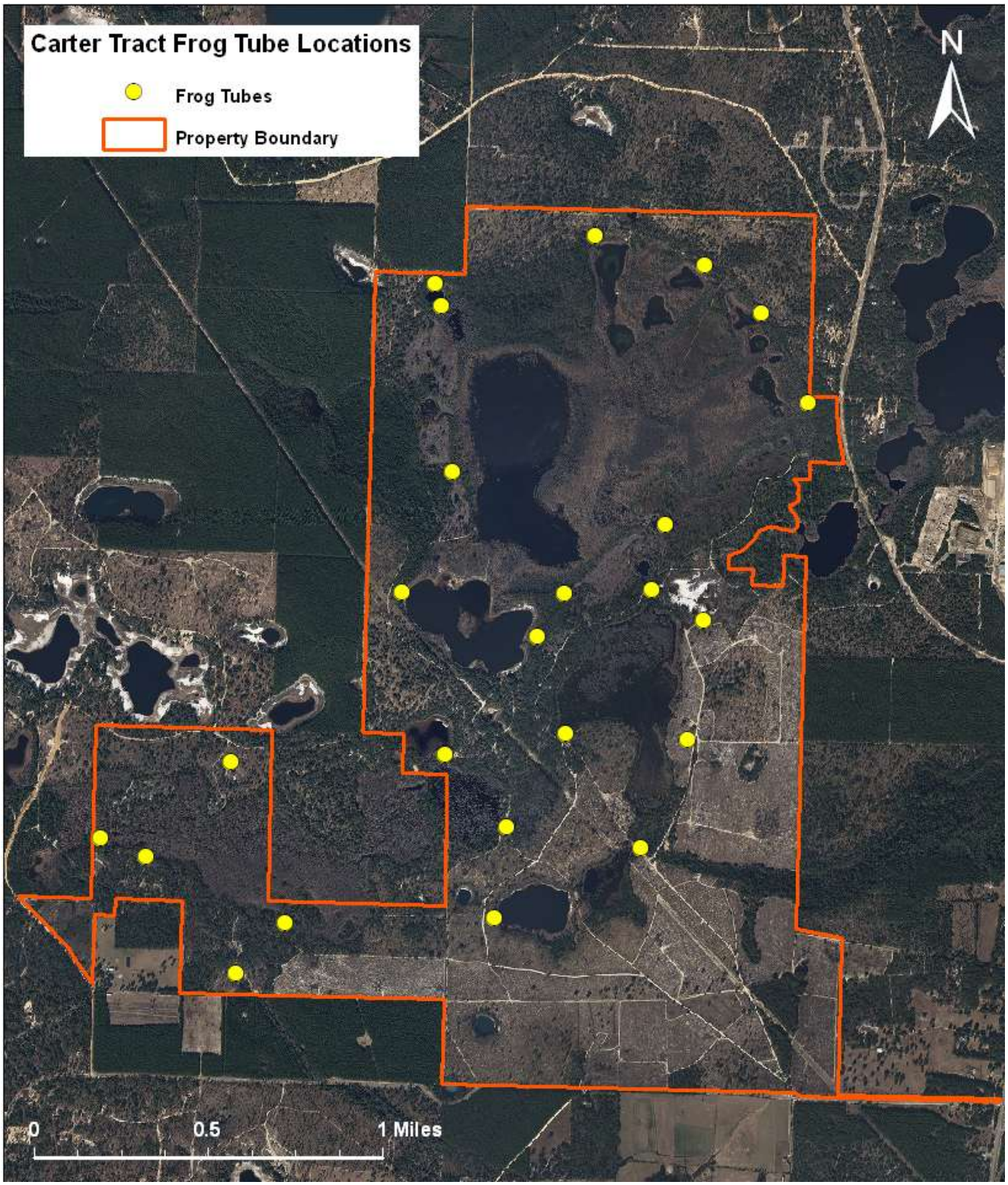

Figure 54. Location of treefrog tubes on the Carter Tract of Econfina Creek WMA, Washington County, Florida.

Figure 55. Treefrog tube placement in a hydric pine flatwoods and two juvenile green treefrogs (*Hyla cinerea*) photographed utilizing a frog tube on the Carter Tract of Econfina Creek WMA, Washington County, Florida.

Snake Traps

During spring 2010, upland snake traps were one of two additional herpetofauna survey methods implemented. Because of their size, large terrestrial snakes such as racers, rat snakes, coachwhips, Florida pine snakes (SSC), and the eastern indigo snake (Threatened) can be difficult to capture using traditional survey methods. Use of traps specifically designed to capture these large terrestrial species is the most effective method for documenting their numbers on the Carter Tract. We therefore constructed three box-style snake traps (Appendix XII) and installed them in conjunction with four 100-foot drift fence arms (Figure 56). Three spatially distinct upland sandhill habitats were chosen based on their vegetation composition and structure, as well as proximity to mesic habitats (Figure 57). Two 5-gal buckets were installed on each side of the four arms of drift fence leading to the box trap (eight total buckets per array) to aid in capturing small- bodied terrestrial snakes, lizards, small mammals, and amphibians. Buckets were maintained with 1-2 inches of soil and a 3 x 5-inch sponge saturated with water to help prevent dessication. The bottoms of buckets were perforated to allow excess rainwater to drain and to prevent drowning of captured animals. Box traps were maintained with a 1.5-gal water tray, and were checked daily beginning in the early morning to prevent dessication and undue stress on captured animals. Traps contained a 22-ounce tin can filled with dried grass to act as refugia for any small mammals captured. All traps were built with a side access door (Figure 56) capable of being propped open when traps are not in use.

Figure 56. Upland snake trap array (left) and snake trap access door (right) used for surveying herpetofauna on the Carter Tract of Econfina Creek WMA, Washington County, Florida.

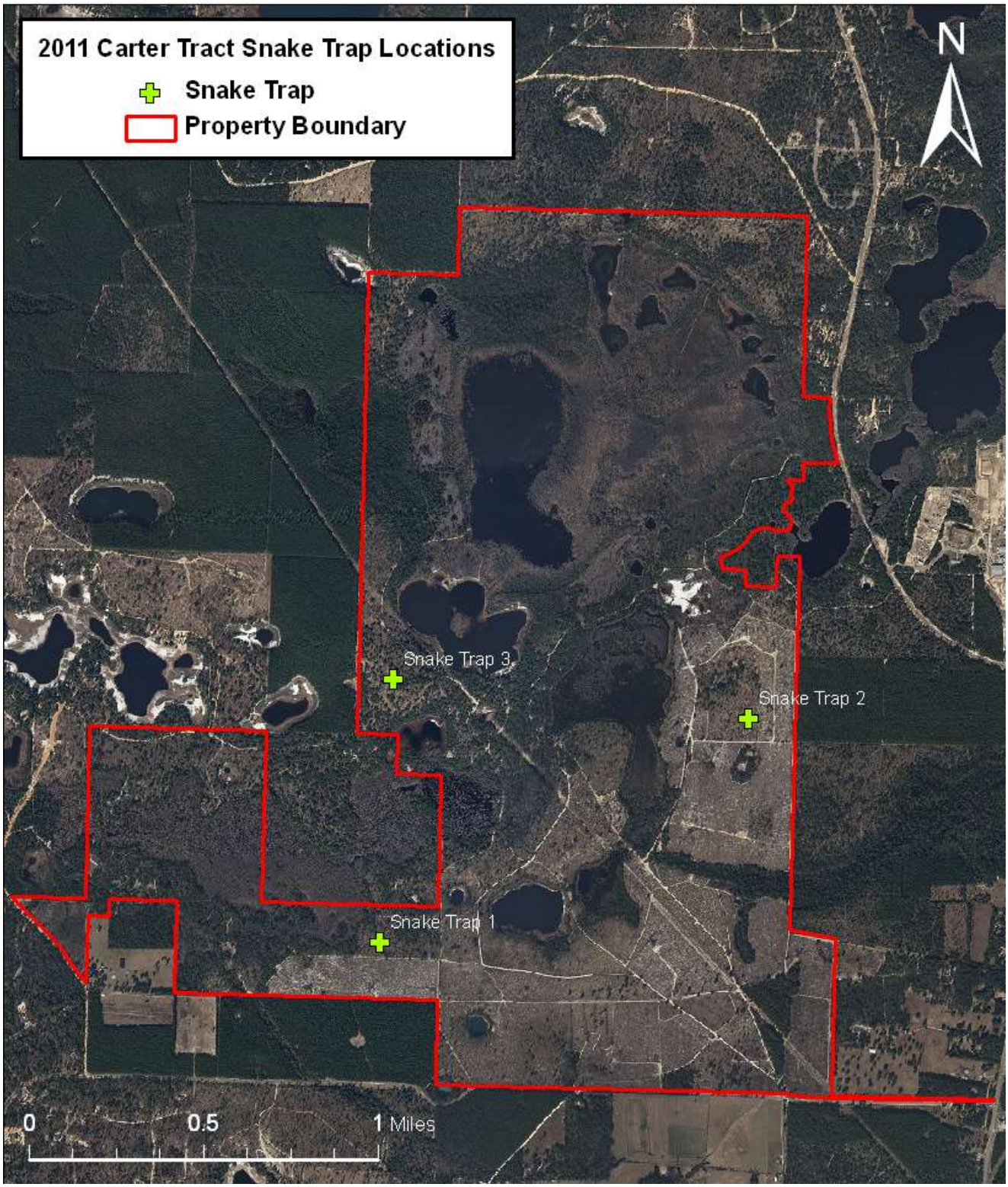

Figure 57. Location of upland snake traps used for sampling herpetofauna on the Carter Tract of Econfina Creek WMA, Washington County, Florida, July 2010 - June 2011.

Traps were set four days a week (Monday – Thursday) from July 2010 – June 2011 (traps were closed December - February). Over 316 trap nights 340 individual animals representing 30 species were captured (Figure 58). Sixty-four percent of animals were captured in buckets while the remaining 36% were captured in box traps. Fifty-two percent of animals captured in box traps were snakes, with 50% of bucket captures being amphibians. The southern black racer (*Coluber constrictor priapus*; n=21), eastern coachwhip (*Masticophis flagellum*; n=16), and dusky pigmy rattlesnake (*Sistrurus miliarus*; n=11) were frequent captured snake species. The southern toad (*Bufo terrestris*) was the most captured amphibian (n=43). All non-venomous snakes captured were marked by clipping belly scutes in a unique numerical pattern following procedures outlined by Enge (1997). Five percent of animals captured were small mammals, one of which, the southeastern shrew (*Sorex longirostris*) was previously unconfirmed as occurring on the Carter Tract. Appendix XIII details the number of species and individuals captured in snake trap arrays (note that species in red had previously been undocumented on the Carter Tract).

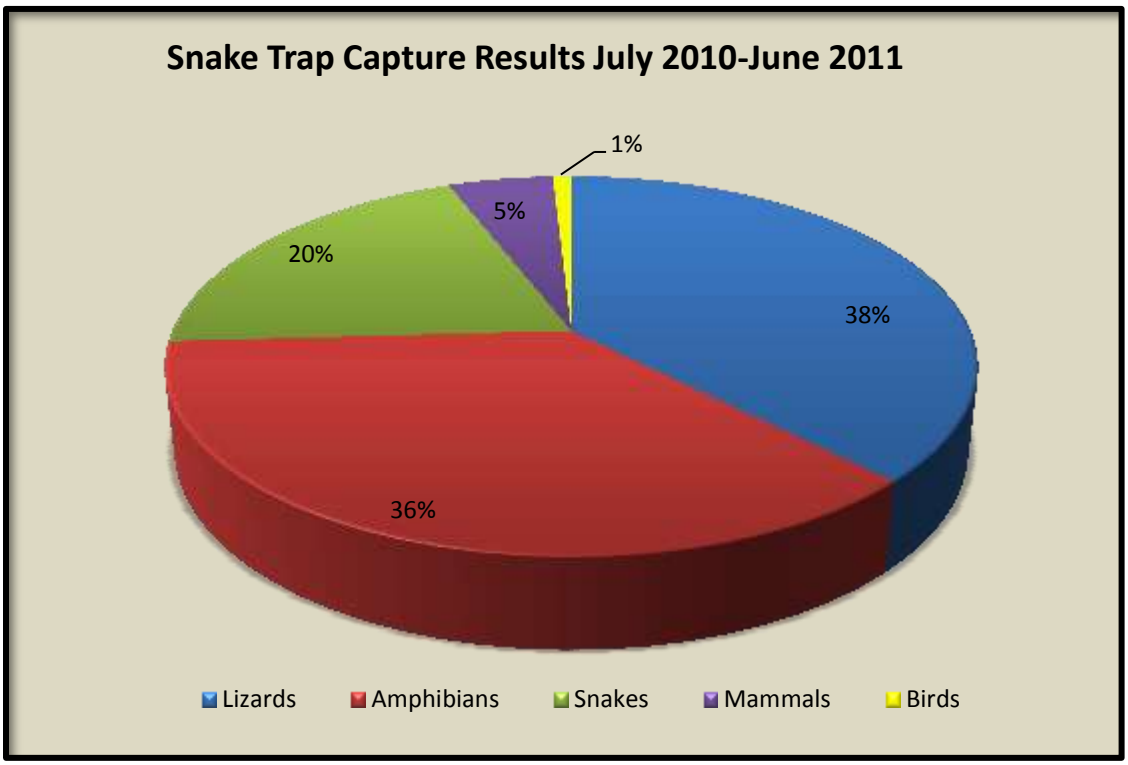

Figure 58. Snake trap capture results from July 2010 - June 2011 on the Carter Tract of Econfina Creek WMA, Washington County, Florida.

Snake capture results from trap installation (March 2010) through July 2011 are presented in Figure 59. Using monthly capture success rates, we determined which months to focus trapping efforts. Based on data collected to date, opening traps from April – June should maximize the capture of snakes emerging fromwinter hibernacula in search of mates. Trapping during September and October should capture the majority of snakes dispersing across the landscape (including YOY born during late summer) before cooler weather forces them underground for the winter. Staff will continue to deploy snake traps on this schedule, adjusting trapping efforts as dictated by weather patterns (i.e. drought conditions) and incidental snake activity observations.

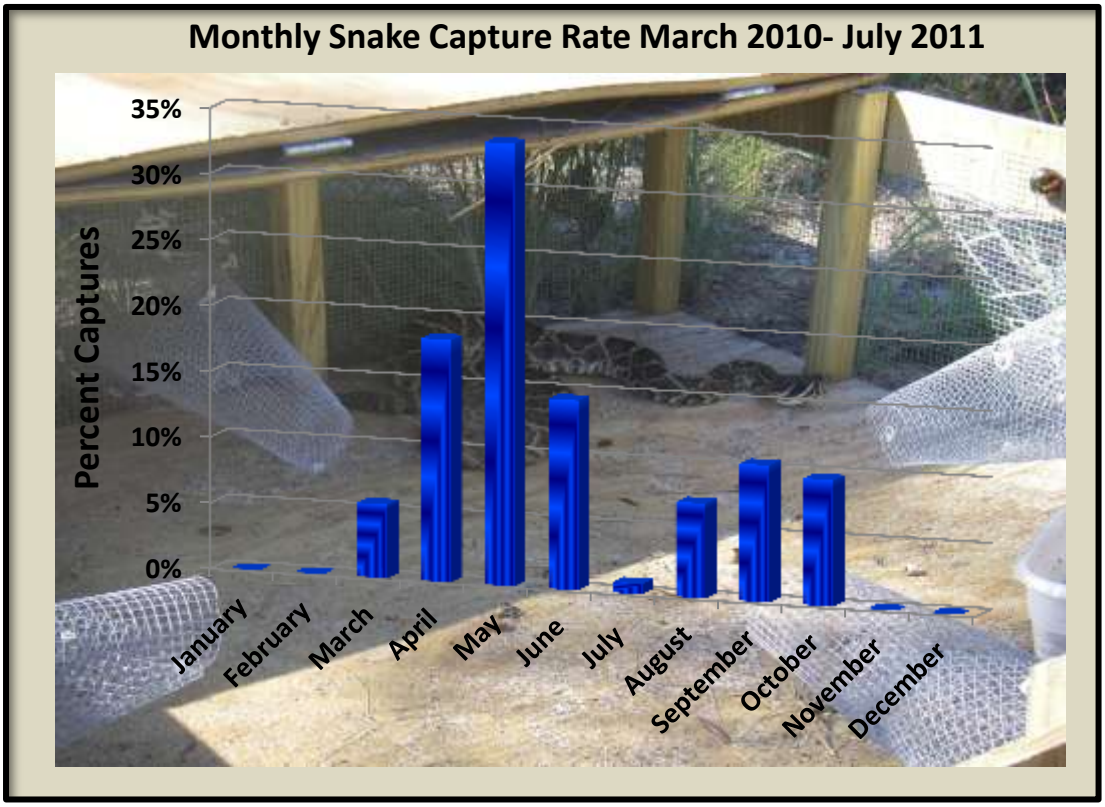

Figure 59. Monthly snake capture rates using upland box-style snake traps from March 2010 – July 2011 on the Carter Tract of Econfina Creek WMA, Washington County, Florida.

Turtle Traps

Documentation of turtle species at the Carter Tract has historically been through incidental observation or accidental capture. To better understand the use of Carter Tract water bodies by different turtle species, use of turtle hoop traps was implemented during March – April 2011. Hoop traps were approximately six feet long, made of 1½-inch #15 knotted nylon netting tied to three galvanized steel hoops 30 inches in diameter. Traps were baited with a combination of sardines and/or fresh fish portions. Plastron length (cm), carapace length (cm), and girth (cm) were recorded (Figure 60) for all turtles except Florida softshells (*Apalone ferox*). Approximate age (adult versus juvenile) and gender were also reported. All hard-shelled turtle species were given a unique numerical mark by notching marginal scutes with a file. Numerical sequencing followed that outlined by Enge (1997). Turtle traps were relocated every eight days and moved to a previously untrapped location (Figure 61). This was done to achieve adequate spatial coverage of trappable water bodies on the Carter Tract, and to identify whether different species might utilize certain ponds more often than others.

Figure 60. All hard-shelled turtles captured were measured (left) and given a unique numerical mark by using a file to notch marginal scutes (right).

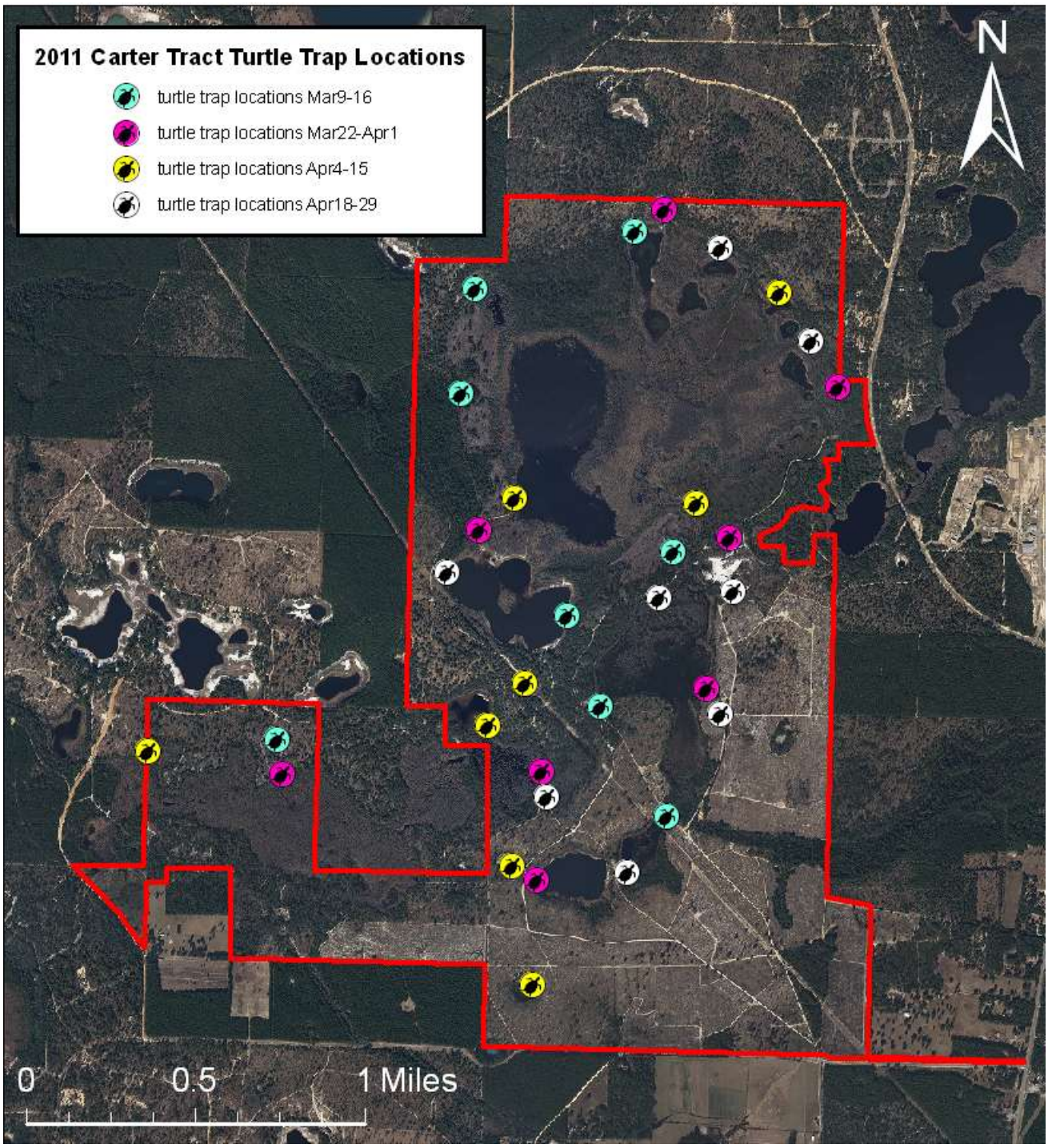

Figure 61. Turtle trap locations from March – April 2011 at the Carter Tract of Econfina Creek WMA, Washington County, Florida.

Over 256 trap nights 41 turtles representing four species were captured (including two confirmed recaptures). The Florida softshell was the most captured species (n=20), followed closely by the yellow-bellied slider (*Trachemys scripta*; n=19). Single specimens of the chicken turtle (*Dierochelys reticularia*) and common musk turtle were captured (Figure 62). Spring 2011 turtle trapping also resulted in the capture of 122 non-target individuals representing eight fish species and one reptile. A detailed table of all species captured is found in Appendix IVX. Nine turtles were also captured opportunistically throughout the site from July 2010 – June 2011. Incidental captures included six yellow-bellied sliders, one chicken turtle, and one gulf coast box turtle (*Terrapene carolina major*). All incidental captures were measured and marked as previously described.

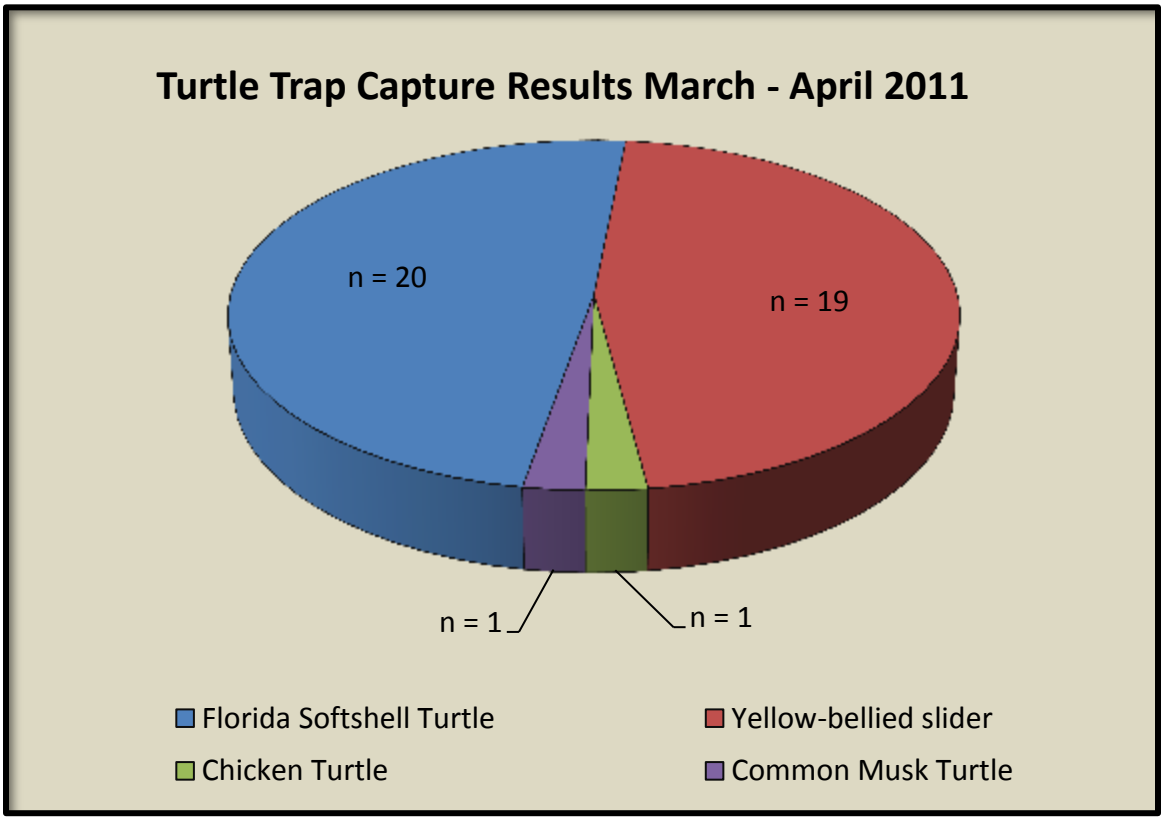

Figure 62. Turtle trap capture results from March – April 2011 on the Carter Tract of Econfina Creek WMA water bodies, Washington County, Florida.

Additional Activities

Small Mammal Surveys

During spring 2011, small mammal trapping was implemented within gopher tortoise clusters on the Carter Tract. The purpose of this trapping effort was two-fold: determine presence/absence of the Florida mouse (*Podomys floridanus)* and document presence of other small mammal species. The Florida mouse is a SSC that prefers xeric upland communities with sandy soils where they inhabit gopher tortoise burrows. While Franklin county contains the nearest confirmed Florida mouse site, the presence of gopher tortoise burrow clusters on the Carter Tract prompted FWC staff to participate in this statewide survey effort to document the Florida mouse on Wildlife Management Areas (Paul Scharine, pers. comm.). Lands with clusters of active and inactive gopher tortoise burrows have the best potential to be occupied by Florida mice, and the Carter Tract boasts 175 active/possibly active and 47 inactive gopher tortoise burrows located in clusters throughout the parcel.

Seven trapping grids covering five gopher tortoise burrow clusters were trapped March 14 – April 28, 2011 (Figure 63). Large folding aluminum Sherman live traps (8 x 9 x 23cm) were set along transects within burrow clusters (Figure 64). Traps were set approximately 15 meters apart with an estimated 20 meters between transects. Each trap was baited with a combination of dried rolled oats and sunflower seeds. A small tuft of Polyfil® synthetic stuffing was placed in the back of each trap to prevent hypothermia on cooler nights. Each grid was trapped for four consecutive nights, yielding 2880 trap-nights combined for all grids trapped.

During the 2011 trapping effort, no Florida mice were captured within any of the seven trapping grids. However, five rodent species were documented, including the cotton rat (*Sigmodon hispidus*; n=8), which had not been confirmed as occurring on the Carter Tract prior to this trapping effort (Table 8). The other four species captured included the oldfield mouse (*Peromyscus polionotus*; n=95), cotton mouse (*Peromyscus gossypinus*; n=20), golden mouse (*Ochrotomys nuttali*; n=1), and southern flying squirrel (n=1).

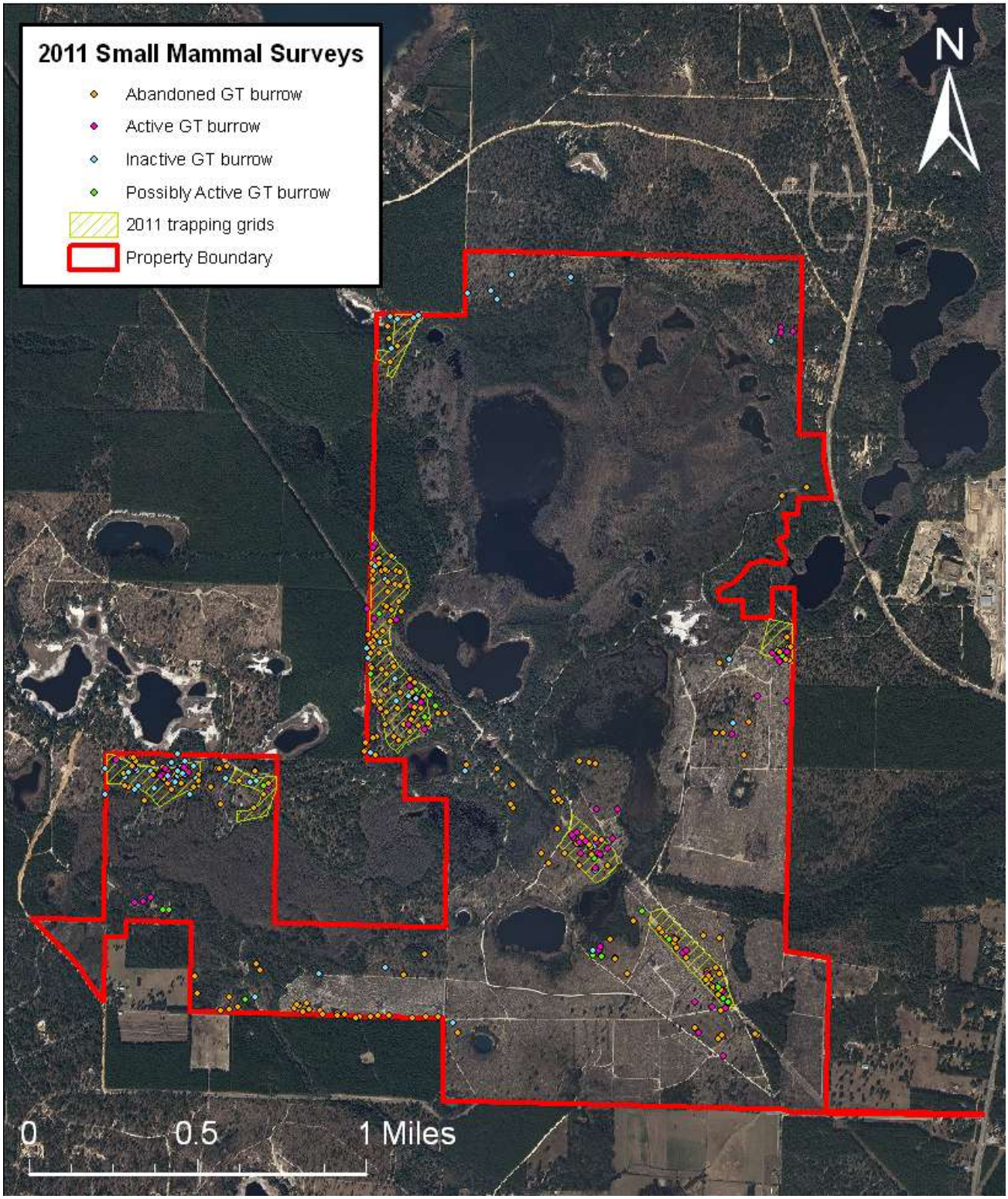

Figure 63. Florida mouse (*Peromyscus floridanus*) trapping grids established March14 – April 28, 2011on the Carter Tract of Econfina Creek WMA, Washington County, Florida.

Figure 64. Sherman box trap used for trapping small mammals on the Carter Tract (left); adult cotton mouse (*Peromyscus gossypinus*) caught during spring 2011 small mammal surveys.

Table 8. Small mammal trapping results from March – April 2011 trapping effort on the Carter Tract of Econfina Creek WMA, Washington County, Florida.

Trapping Grid	Acres	Florida mouse	Oldfield mouse	Cotton mouse	Cotton rat	Golden mouse	Flying squirrel	trap-nights
Cluster 1	6.3	0	7	6	0	0	0	240
Cluster 2	5.9	0	5	1	0	1	0	240
Cluster 3	14.4	0	39	0	7	0	0	480
Cluster 4-North A	22.7	0	7	1	0	0	0	480
Cluster 4-North B	14.8	0	3	4	0	0	0	480
Cluster 4-South	11.4	0	29	1	0	0	0	480
Cluster 5A	20.5	0	5	7	1	0	1	480
TOTAL	96	0	95	20	8	1	1	2880

Public Safety

During late summer 2009 through spring 2010, FWC staff and Carter Tract recreators periodically witnessed a pack of free-ranging dogs running through the property. Following an incident involving direct interaction with a pack of dogs, FWC staff began actively trapping for feral dogs beginning in December 2009. Six large (60 x 20 x 26in) Tomahawk® cage-style live traps were set in strategic locations based on visual confirmation of the pack and other sign (i.e. dog tracks and digging under boundary fences), and adjusted accordingly as behavior patterns and areas of use changed. Traps were baited daily with dry and wet dog food and checked the following morning. During 2009-2010 six feral dogs were captured. Trapping efforts continued during 2010-2011,

focusing trapping efforts during fall/winter months when feral dog activity was highest. Over 176 trap nights, three feral dogs, eight gray fox (*Urocyon cinereoargenteus*), 16 Virginia opossum (*Didelphis virginiana*), and 46 Northern raccoons (*Procyon lotor*) were captured. All non-target captures were released immediately at the locatoin of capture. All dogs captured were handled by Washington County Animal Control upon immediate notification. Future trapping for feral dogs will continue as needed at the Carter Tract.

Historic Boat Recovery

The Carter Tract is named after Fitzhugh Carter, a now-deceased former school teacher from Vernon, Florida. Fitzhugh owned the property and managed it as a "fishing ranch" where folks could pay $1/day to fish. He used an old sawmill to cut timber for dams, bridges, spillways, benches, and boats for the property. At one time there were 50 hand-made cypress boats on the property for paying customers to use. Many of these boats remain on the property today, although most are dilapidated and sunk around the edges of area ponds. However, May 2011 drought conditions exposed some of the old boats. FWC staff located a boat near Green Pond 1 that appeared to still be intact. The boat was excavated (Figure 65) and plans are to preserve it and display it in conjunction with a kiosk relating the history of the Carter Tract.

Figure 65. A hand-made cypress boat previously inundated at Green Pond 1 (left) was excavated by FWC staff (right) and will be preserved and displayed along with an informational kiosk.

LAW ENFORCEMENT ACTIVITIES

FWC Law Enforcement Activities
(Lieutenant Hampton Yates reporting)

Florida Fish and Wildlife Conservation Commission officers patrol the Carter Tract providing enforcement to include wildlife and fisheries enforcement and general law enforcement including narcotics and trespass violations. This FY 2010-2011 officers provided approximately 110 hours of patrol directed to the Carter Tract. We had approximately 36 user contacts for the area with no arrests or written warnings issued. Area officers reported activity on the area seemed to be light compared to previous years.

Officers conducted foot patrol and all terrain vehicle patrols of the interior roads and perimeter for the area throughout the year. Officers targeted patrols to work illegal hunting, trespassing, and baiting violations during the hunting season. Continued patrols to monitor night hunting were conducted along the area boundaries.

This past year's activity included where one officer responded to a search and rescue complaint there regarding a lost hunter, and he responded to a report of illegal entry in one location and one incident of bait in a portion of the tract that is not fenced and/or posted as a wildlife management area. Two officers worked on past bait complaints to determine if the activity continued. Another officer worked a baited site with corn this past year with no further activity.

Officers continued monitoring with Carter Tract personnel regarding a pack of dogs running on the area from the previous year. One of these dogs was responsible for biting an area employee during a field work day which resulted in traps set for the dogs. We believe contact with area residents made a slight difference in the free running dog issued and this curtailed the problem somewhat. This year one officer responded to a complaint where two traps were stolen from the biological staff on site. This officer patrolled the nearby areas and residences to spread the work to be on the look-out for these stolen traps.

From our contacts with patrols we were forwarded suggestions from the public utilizing the property. These included where one turkey hunter requested extending the youth season to the state lands, complaints on the low water issues, and of the general public seeking to have this area included the alligator hunts in this area.

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Appendix I. Fitzhugh Carter Tract of Econfina Creek WMA Regulations Summary and Area Map, July 1, 2010 – June 30, 2011.

2010-2011 Hunting Season

Fitzhugh Carter Tract

Econfina Creek

Wildlife Management Area

Regulations Summary and Area Map
July 1, 2010 - June 30, 2011

A cooperative public wildlife and recreational area

Northwest Florida Water Management District

Florida Fish and Wildlife Conservation Commission

MyFWC.com

This brochure is designed to provide the public with information and a summary of regulations pertaining to hunting, fishing and other recreational use on the Fitzhugh Carter Tract of Econfina Creek Wildlife Management Area. **Regulations that are new or differ substantially from last year are shown in bold print.** Area users should familiarize themselves with all regulations. For exact wording of the wildlife laws and regulations, see the Florida Fish and Wildlife Conservation Commission's wildlife code, on file with the Secretary of State and state libraries. This brochure, the Florida Hunting Regulations handbook, and quota permit worksheets should provide the information necessary for you to plan your hunting activities. These publications are available from any Commission office, county tax collector and at MyFWC.com.

Persons using wildlife management areas are required to have appropriate licenses, permits and stamps. The following persons are exempt from all license and permit requirements (except for quota permits when listed as "no exemptions", recreational use permits, antlerless deer permits and the Migratory Bird Hunting and Conservation Stamp [federal duck stamp]): Florida residents who are 65 years of age or older; residents who possess a Florida Resident Disabled Person Hunting and Fishing Certificate; residents in the U.S. Armed Forces, not stationed in Florida, while home on leave for 30 days or less, upon submission of orders; and children under 16 years of age. Children under 16 years of age are exempt from the duck stamp. Anyone born on or after June 1, 1975 and 16 years of age or older must have passed a Commission-approved hunter-safety course prior to being issued a hunting license, except the Hunter Safety Mentoring exemption allows anyone to purchase a hunting license and hunt under the supervision of a licensed hunter, 21 years of age or older, for one year.

Licenses and permits may be purchased from county tax collectors, license agents, at MyFWC.com/license or by telephone at 1-888-486-8356 (hunting) or 1-888-347-4356 (fishing). A no-cost Migratory Bird Permit is available when purchasing a hunting license. Any waterfowl hunter 16 years of age or older must possess a federal duck stamp; available where hunting licenses are sold, at most post offices or at duckstamp.com. **Note: A $5 deer permit is required to hunt deer.**

QUOTA PERMIT INFORMATION:
Archery - 15, no-cost, quota permits (no exemptions) for each of 2 hunts.
Muzzleloading Gun - 15, no-cost, quota permits (no exemptions).
General Gun - 15, no-cost, quota permits (no exemptions) for each of 3 hunts.
Spring Turkey - 5, no-cost, quota permits (no exemptions) for each of 3 hunts.

Daily Fishing Permits: Only twenty anglers are allowed on the area per day. Ten daily permits are available first-come, first-serve at the check station; ten daily permits can be reserved in advance by calling 850-773-2631. If reserve permits are not filled by 11 a.m., they become available at the check station first-come, first-serve. Permits are issued with specific lake designations, and anglers are required to remain at the lake for which the permit is issued and have the permit in their possession at all times.

Permit applications: Hunters must submit electronic applications for quota and special-opportunity permits through the Commission's Total Licensing System (TLS). Worksheets listing hunts, application periods, deadlines and instructions are available at county tax collector's offices, FWC offices or MyFWC.com. Quota application periods occur throughout the year beginning April 1; please refer to the hunting handbook or MyFWC.com for specific dates. Worksheets will be available about 2 weeks prior to each application period.

Guest hunters: For each non-transferable archery, muzzleloading gun, general gun, wild hog, spring turkey and mobility-impaired quota permit issued through the Commission's TLS, only one guest permit may be obtained. The following persons may be a guest hunter, but are not required to obtain a guest permit: a youth under 16 years of age, a youth supervisor, a mentor license holder or a mentor license supervisor. A quota permit holder (host) may only bring 1 guest hunter at a time. The following persons are not considered to be guest hunters: other quota permit holders, non-hunters and exempt hunters (on areas and during seasons that allow exemptions). The host must share the bag limit with the guest and the host is responsible for violations that exceed the bag limit. The guest and host must enter and exit the area together and must share a street-legal vehicle while hunting on the area. The guest may only hunt while the host is on the area. A person is only eligible for one guest permit per hunt. Guest permits may only be obtained from license agents or county tax collector's offices. Guest permits may be obtained up to and during the last day of the hunt. Refer to the quota hunt worksheets for additional information.

Youth and mentor license holders: A youth hunter (less than 16 years of age) must be supervised by a person at least 18 years of age. A mentor license holder must be supervised by a licensed hunter at least 21 years of age. Unless exempt, only those supervisors with proper licenses and permits may hunt. If the supervisor is hunting during any hunt (not including special-opportunity) for which quota permits are issued, at least one person in the party must be in possession of a quota permit. During a hunt that allows exemptions, a non-exempt supervisor of a youth must have a quota permit to hunt. A non-hunting supervisor is allowed to accompany a youth or mentor license holder during any hunt (including special-opportunity).

Transfer of permits: Quota and guest permits are not transferable. Except for youth under 16 years of age, a positive form of identification is required when using a non-transferable permit. The sale or purchase of any quota permit or guest permit is prohibited.

GENERAL AREA REGULATIONS:
All general laws and regulations relating to wildlife and fish shall apply unless specifically exempted for this area. Hunting or the taking of wildlife or fish on this area shall be allowed only during the open seasons and in accordance with the following regulations:

1. Any person hunting deer or accompanying another person hunting deer shall wear at least 500 square inches of daylight fluorescent-orange material as an outer garment, above the waistline. These provisions are not required when hunting with a bow and arrow during archery season.
2. Taking of spotted fawn, swimming deer or roosted turkey is prohibited. Species legal to hunt are listed under each season.
3. It is illegal to hunt over bait or place any bait or other food for wildlife on this area.
4. Driving a metal object into any tree, or hunting from a tree into which a metal object has been driven, is prohibited.
5. No person shall cut, damage or remove any natural, man-made or cultural resource without written authorization of the landowner or primary land manager.
6. Taking or attempting to take any game with the aid of live decoys, recorded game calls or sounds, set guns, artificial light, net, trap, snare, drug or poison is prohibited. **Recorded calls and sounds can be used to hunt furbearers and crows.**
7. The wanton and willful waste of wildlife is prohibited.
8. Hunting, fishing or trapping is prohibited on any portion of the area posted as closed to those activities.
9. People, dogs, vehicles and other recreational equipment are prohibited in areas posted as "Closed to Public Access" by FWC administrative action.
10. Taking or herding wildlife from any motorized vehicle, aircraft or boat, which is under power is prohibited until power, and movement from that power, has ceased.
11. Most game may be hunted from ½ hour before sunrise until ½ hour after sunset (see exceptions for each season).
12. The release of any animal is prohibited, without written authorization of the landowner or primary land manager.
13. The head and evidence of sex may not be removed from the carcass of any deer or turkey on the area.
14. The planting or introduction of any non-native plant is prohibited, without written authorization of the landowner or primary land manager.
15. Wild hog may not be transported alive.
16. Littering is prohibited.
17. It is unlawful to set fire to any forest, grass or woodlands.
18. A Fish and Wildlife Conservation Commission Law Enforcement Officer may search any camp, vehicle or boat in accordance with law.
19. **Falconers may hunt during the statewide falconry season anytime a management area is open for public access. Falconers are not exempt from quota permits during hunts requiring them.**
20. The possession or consumption of intoxicating beverages is prohibited.

PUBLIC ACCESS AND VEHICLES:

1. Open to public access year round.
2. All persons entering or exiting the Fitzhugh Carter Tract may do so only at a designated entrance (see map).
3. Parked vehicles may not obstruct a road, gate or firelane.
4. No motor vehicle shall be operated on any part of any wildlife management area that has been designated as closed to vehicular traffic.
5. Vehicles may be operated only on named or numbered roads.
6. The use of all-terrain vehicles is prohibited.
7. Horses **and bicycles** are prohibited.

HUNTERS, ANGLERS AND CHECK STATIONS:

1. Hunters and anglers shall check in and out at the check station when entering and exiting the area and shall check all game and fish taken.
2. Hunting equipment and dogs may be taken onto the WMA after 8 a.m. the day before the opening of a season and shall be removed by 6 p.m. one day after the end of the season.
3. Fishing on the Carter Tract is open Friday through Monday, starting at 6 a.m. Gates close at 8 p.m. during the summer period (May – September) and at 5 p.m. during the winter period (October – April). See the Fishing and Frogging section for more details.

GUNS:

1. All firearms shall be securely encased and in a vehicle, vessel, camper or tent, during periods when they are not a legal method of take. Persons in possession of a valid Concealed Weapon or Firearm License may carry concealed handguns.
2. Target practice is prohibited.
3. Hunting with a gun and light is prohibited.
4. Muzzleloading guns used for taking deer must be .40 caliber or larger if firing a single bullet, or be 20 gauge or larger if firing two or more balls.
5. Children under the age of 16 may not be in possession of a firearm unless in the presence of a supervising adult.
6. No person shall have a gun under control while under the influence of alcohol or drugs.
7. For hunting non-migratory game, only shotguns, rifles, pistols, bows, crossbows (during the general gun, small game and spring turkey seasons or by permit) or falconry may be used.
8. For hunting migratory game, only shotguns, bows, **crossbows** or falconry may be used. Shotguns shall not be larger than 10 gauge and shall be incapable of holding more than three shells in the magazine and chamber combined.
9. Firearms using rimfire or non-expanding, full metal jacket (military ball) ammunition are prohibited for taking deer.
10. Fully automatic or silencer-equipped firearms, centerfire semi-automatic rifles having a magazine capable of holding more than five rounds, explosive or drug-injecting devices and setguns are prohibited.

DOGS:

1. Hunting with dogs, other than bird dogs or retrievers, is prohibited.
2. No person shall allow any dog to pursue or molest any wildlife during any period in which the taking of wildlife by the use of dogs is prohibited.
3. Dogs on leashes may be used for trailing wounded game.
4. For purposes other than hunting, dogs are allowed, but must be kept under physical restraint at all times.

CAMPING: Prohibited.

BAG AND POSSESSION LIMITS: During quota hunts, host hunters and guests must share all bag and possession limits.

1. Deer - Daily limit 2, possession limit 4 (see legal to take for each season).
2. Wild hog - No size or bag limit.
3. Turkey - Daily limit 1, season limit 2, possession limit 2.
4. Gray squirrel, quail and rabbit - Daily limit 12, possession limit 24 for each.
5. Raccoon, opossum, armadillo, beaver, coyote, skunk and nutria - No bag limits.
6. Bobcat and otter - Possession limit 1 unless in possession of a Trapping License.
7. Migratory birds - See Migratory Bird Hunting Regulations pamphlet.

ARCHERY SEASON:
October 16-22 and October 23-31.

Permit, Stamp and License Requirements - Quota permit, hunting license, management area permit, archery permit, **deer permit (if hunting deer)**, wild turkey permit (if hunting wild turkey) and migratory bird permit (if hunting migratory birds).

Legal to Hunt - Any deer (except spotted fawn), wild hog, turkey of either sex, gray squirrel, quail, rabbit, raccoon, opossum, armadillo, beaver, coyote, skunk, nutria and migratory birds in season.

Regulations Unique to Archery Season - In addition to these regulations, all General Area Regulations shall apply. Hunting with firearms or crossbows is prohibited, except that centerfire shotguns are allowed for hunting migratory birds when one or more species are legal to hunt (see Migratory Bird section and the current Migratory Bird Hunting Regulations pamphlet).

MUZZLELOADING GUN SEASON:
November 19-21.

Permit, Stamp and License Requirements - Quota permit, hunting license, management area permit, muzzleloading gun permit, **deer permit (if hunting deer)**, migratory bird permit (if hunting migratory birds) and state waterfowl permit and federal duck stamp (if hunting waterfowl).

Legal to Hunt - Deer with at least one antler 5 inches or more in length, wild hog, gray squirrel, quail, rabbit, raccoon, opossum, armadillo, beaver, coyote, skunk, nutria and migratory birds in season.

Regulations Unique to Muzzleloading Gun Season - In addition to these regulations, all General Area Regulations shall apply. Hunting with

archery equipment or firearms, other than muzzleloading guns, is prohibited, except that centerfire shotguns are allowed for hunting migratory birds when one or more species are legal to hunt (see Migratory Bird section and the current Migratory Bird Hunting Regulations pamphlet).

SMALL GAME SEASON:

December 4-19.

Permit, Stamp and License Requirements - Hunting license, management area permit, migratory bird permit (if hunting migratory birds) and state waterfowl permit and federal duck stamp (if hunting waterfowl).

Legal to Hunt - Wild hog, gray squirrel, quail, rabbit, raccoon, opossum, armadillo, beaver, coyote, skunk, nutria, bobcat, otter and migratory birds in season.

Regulations Unique to Small Game Season – In addition to these regulations, all General Area Regulations shall apply. Hunting with centerfire rifles is prohibited.

GENERAL GUN SEASON:

November 25-28, January 22-25 and 26-30.

Permit, Stamp and License Requirements - Quota permit, hunting license, management area permit, **deer permit (if hunting deer)**, migratory bird permit (if hunting migratory birds) and state waterfowl permit and federal duck stamp (if hunting waterfowl).

Legal to Hunt - Deer with at least one antler 5 inches or more in length, wild hog, gray squirrel, quail, rabbit, raccoon, opossum, armadillo, beaver, coyote, skunk, nutria and migratory birds in season. Bobcat and otter beginning December 1.

Regulations Unique to General Gun Season - In addition to these regulations, all General Area Regulations shall apply.

SPRING TURKEY SEASON:

March 19-21, April 1-3 and 15-17.

Permit, Stamp and License Requirements - Quota permit, hunting license, management area permit and wild turkey permit.

Legal to Hunt - Bearded turkey or gobbler.

Regulations Unique to Spring Turkey Season - In addition to these regulations, all General Area Regulations shall apply.

1. Legal shooting hours are ½ hour before sunrise until 1 p.m.
2. Hunting other animals is prohibited.

TRAPPING: Prohibited.

MIGRATORY BIRD SEASONS:

Rails, common moorhen, mourning dove, white-winged dove, snipe, duck, geese, coot, woodcock and crows may be taken only during seasons that coincide with the archery, muzzleloading gun, general gun or small game seasons. Waterfowl hunting is allowed during the special September duck season.

Permit, Stamp and License Requirements - Quota permit (if hunting during any quota period), hunting license, management area permit, migratory bird permit and state waterfowl permit and federal duck stamp (if hunting waterfowl).

Legal to Hunt - See Migratory Bird Hunting Regulations pamphlet.

Regulations Unique to Migratory Bird Seasons - In addition to these regulations, all General Area Regulations shall apply.

1. Hunting duck, geese and coot with lead shot is prohibited.
2. Centerfire shotguns are allowed for hunting during established area seasons when one or more migratory birds are legal to take.

FISHING AND FROGGING:

Allowed Friday through Monday (except during weekends open to hunting) by permit only.

Permit, Stamp and License Requirements - Daily fishing permit and fishing license (not required when frogging).

Legal to Take - All legal fish (except as provided below) and frogs. See Florida Freshwater Fishing Regulations Summary.

Regulations Unique to Fishing and Frogging - All General Area Regulations and General Freshwater Fishing Regulations shall apply.

1. Anglers shall check in and out at the check station when entering and exiting the area and shall check all fish taken.
2. Fishing is allowed in designated lakes and water bodies only. All other lakes, water bodies and restricted areas are closed to public fishing.
3. Boats are provided for use on each lake; these boats must be kept at the lake on which they are placed. No outside boats are allowed into the area.
4. Fish may be taken only by hook and line or rod and reel.
5. No person shall take more than 20 panfish in the aggregate per day. Any bluegill or redear sunfish less than 8 inches in total length must be released immediately. No person shall take more than 10 black crappie per day. Any black crappie less than 10 inches in total length must be released immediately. All largemouth bass are catch and release only.
6. Fish may not be filleted, nor the head or tail fin removed, until the angler has checked out at the check station.
7. Anglers will be given a creel kit and are expected to completely and accurately complete the information sheet and return it to the check station upon check out.
8. Shooting frogs is allowed only during the listed open hunting seasons and only with the legal methods of take during each particular season.

GENERAL INFORMATION:

1. Information for persons with disabilities can be found at MyFWC.com/ADA.
2. If you have any questions about this material, please call the Fish and Wildlife Conservation Commission at 850-265-3676 (**TDD** 800-955-8771).

NORTHWEST FLORIDA WMD RULES AND INFORMATION:

1. This land was acquired by the Northwest Florida Water Management District to protect public water resources. The purpose of the District's land acquisition and management program is to conserve and protect unique and irreplaceable land and water resources, restore areas to their original condition as much as possible and allow controlled multiple recreational and educational uses consistent with this purpose.
2. **Recreation maps of the area are available at nwfwmd/recreation/econfinacreek.html.**
3. The Northwest Florida Water Management District land management activities for this area may include prescribed burning and timber harvesting during most months of the year. For personal safety reasons, area users should be aware of activities in the area and contact the District's Land Management office at 850-539-5999 with any questions. The District has no responsibility or obligation to identify and/or protect personal property while undertaking its land management activities.

COOPERATION REQUESTED:

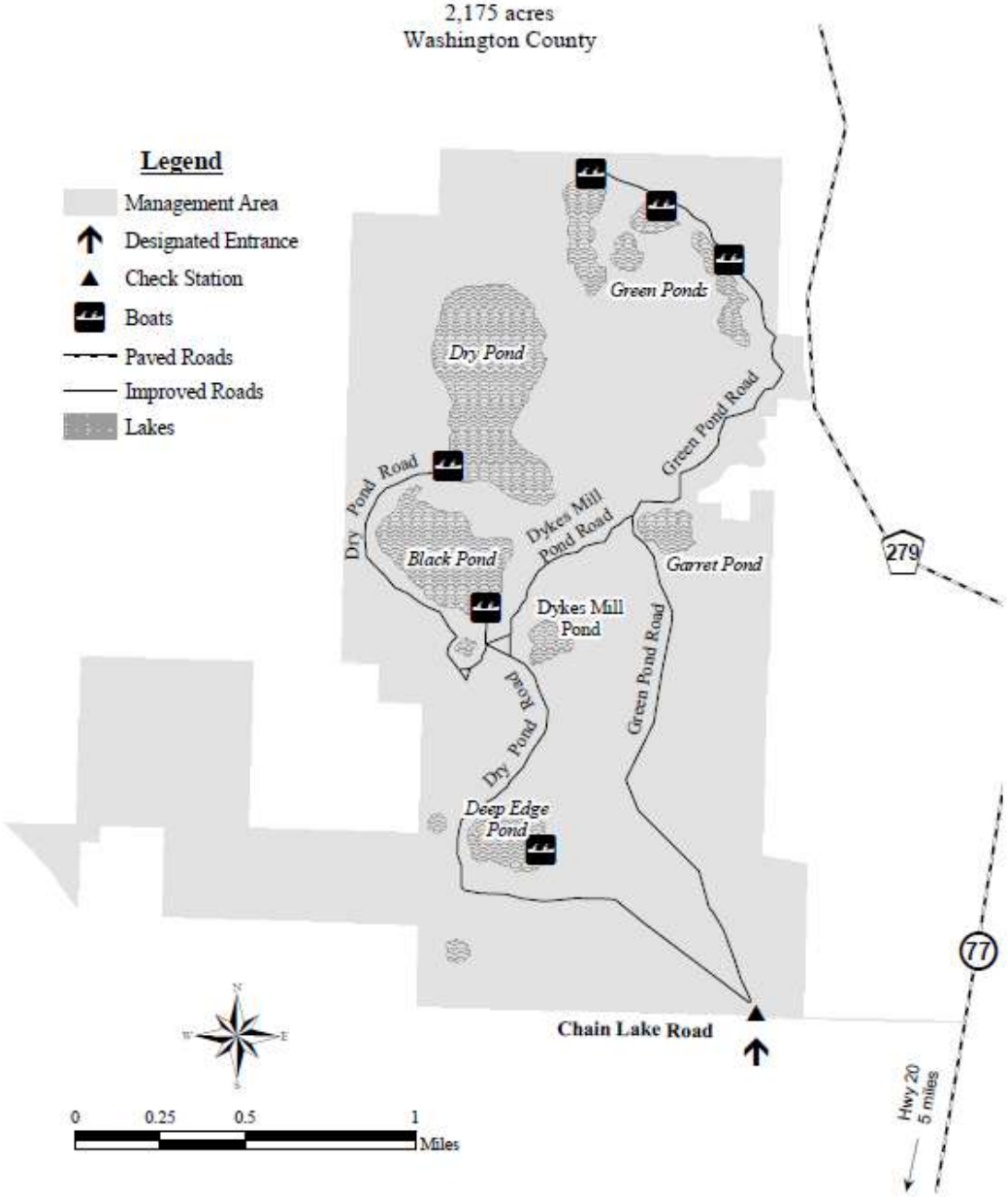
If you see law violators or suspicious activities, contact your nearest Commission regional office or call 1-888-404-FWCC. You may qualify for a cash reward from the Wildlife Alert Reward Association.

The U.S. Department of the Interior prohibits discrimination on the basis of race, color, national origin, age, sex or handicap. If you believe that you have been discriminated against in any program, activity or facility as described above, or if you desire further information, please write to: The Office for Human Resources, U.S. Fish and Wildlife Service, Department of the Interior, Washington, D.C. 20240. The project described in this publication is part of a program funded by federal dollars under the Wildlife Restoration Act. Federal funds pay 20 percent of the cost of the program.

FITZHUGH CARTER TRACT

ECONFINA CREEK WILDLIFE MANAGEMENT AREA

2,175 acres
Washington County



Appendix II. 2010-2011 Annual Work Plan and Accomplishment Report for the Carter Tract of Econfina Creek Wildlife Management Area.

FY 2010-11
Project 7281 - NW FLORIDA WATER MANAGEMENT DISTRICT LANDS

		Man Days	Salary	FuelCost	Other	Total	Units	Accomplishments
Species 9100 - All freshwater fish								
Activity - 221	Animal surveys							
		3.16	$607.98	$64.72	$368.62	$1,041.32	0	Conducted sampling of fish populations in area ponds via electroshocking and fyke nets. NFA.
Activity - 250	Monitoring and assessments							
		4.48	$765.01	$134.19	$560.14	$1,459.34	0	Monitored area fish population and developed a comprehensive sportfish population assessment through otholith analysis and biological data collected from samples. NFA.
Activity - 342	Public use administration (non-hunting)							
		3.78	$644.29	$2,029.62	$21,159.14	$23,833.05	0	Administered public fishing program. Distributed daily quotas and boats. Collected area use data from fishermen. Salary for OPS fishing check station operators included here. NFA.
Species 9100 Total		11.42	$2,017.28	$2,228.52	$22,087.90	$26,333.70		
Species 9200 - All wildlife								
Activity - 100	Administration							
		0.42	$70.14	$9.06	$0.00	$79.20	0	Conducted administrative and

	Man Days	Salary	FuelCost	Other	Total	Units	Accomplishments
							clerical duties. Purchased office supplies and equipment.
Activity - 101	Project inspection						
	9.55	$1,823.66	$385.73	$3,477.71	$5,687.10	0	Inspected area projects and activities. Field orientation of land boundaries, features and habitats.
Activity - 103	Meetings						
	31.31	$5,941.18	$518.62	$2,063.34	$8,523.14	0	Attended landowner, cooperator, scientific and agency meetings. Attended training workshops and seminars.
Activity - 140	Report writing/editing/manuscript preparation						
	16.61	$3,189.78	$298.14	$287.40	$3,775.32	0	Prepared annual and wildlife management reports and cost-share proposal. Attended training workshops, seminars, and online training sessions.
Activity - 150	Personnel management						
	8.61	$1,855.53	$125.13	$0.00	$1,980.66	0	Supervised volunteer activities. Recruited, hired and supervised OPS.
Activity - 182	Data management						
	13.44	$2,612.38	$302.03	$1,237.86	$4,152.27	0	Digitized habitat features for use in GIS database. Incorporated all data into GIS database. Analyzed and summarized WMA databases and pertinent

	Man Days	Salary	FuelCost	Other	Total	Units	Accomplishments
							information. Created and maintained various databases related to area activities and projects. Purchased computer, printer and office supplies.
Activity - 200	Resource Management						
	26.96	$5,071.78	$560.47	$4,695.27	$10,327.52	0	Routine planning, paperwork, purchases and correspondences dealing with daily operations of the WMA. Purchased fuel for area vehicles and equipment.
Activity - 204	Resource planning						
	56.98	$11,941.91	$863.79	$7,787.12	$20,592.82	0	Coordinated work projects related to management activities. Prepared written work plans and management proposals. Purchased supplies, materials and equipment for performing routine WMA operations.
Activity - 312	Informational signs						
	0.00	$0.00	$10.36	$160.52	$170.88	0	Developed and maintained information signs at kiosk and display boards.
Activity - 320	Outreach and education						
	0.62	$119.55	$12.94	$133.50	$265.99	0	Participated in wildlife management presentations to area school groups.
Activity - 350	Customer service support						

		Man Days	Salary	FuelCost	Other	Total	Units	Accomplishments
		1.94	$376.94	$28.91	$0.00	$405.85	0	Provided verbal and written information to the public regarding wildlife and wildlife management techniques.
Activity - 920	FEM -- buildings/structures							
		0.49	$90.94	$3.45	$1,435.35	$1,529.74	0	Maintained and repaired area office and buildings as needed, including electrical and phone service.
Activity - 923	FEM -- vehicles/equipment							
		0.00	$0.00	$0.00	$5,902.04	$5,902.04	0	Repaired and maintained vehicles, boats, ATVs and associated equipment, including services-parts and labor.
Species 9200 Total		166.93	$33,093.79	$3,118.64	$27,180.11	$63,392.54		
Species 9210 - Game wildlife								
Activity - 221	Animal surveys							
		0.00	$0.00	$0.00	$265.44	$265.44	0	Conducted deer spotlight surveys employing distance sampling methodology.
Activity - 341	Public use administration (hunting)							
		3.12	$789.87	$1,101.11	$11,534.25	$13,425.23	0	Collected biological data and samples from harvested game at check station. Salary for OPS hunting check station operators included here.
Species 9210 Total		3.12	$789.87	$1,101.11	$11,799.69	$13,690.67		

	Man Days	Salary	FuelCost	Other	Total	Units	Accomplishments
Species 9211 - White-tailed deer							
Activity - 182 Data management							
	0.42	$89.53	$23.30	$280.36	$393.19	0	Summarized and analyzed survey, biological, harvest and hunter pressure data.
Activity - 221 Animal surveys							
	8.58	$1,851.73	$122.97	$368.62	$2,343.32	0	Conducted deer spotlight surveys employing distance sampling methodology.
Species 9211 Total	9.00	$1,941.26	$146.27	$648.98	$2,736.51		
Species 9218 - Quail							
Activity - 221 Animal surveys							
	2.29	$555.39	$38.40	$153.01	$746.80	0	Conducted fall covey calling surveys.
Species 9218 Total	2.29	$555.39	$38.40	$153.01	$746.80		
Species 9222 - Wood duck							
Activity - 182 Data management							
	2.23	$375.39	$49.19	$67.95	$492.53	0	Analyzed and summarized wood duck nest box monitoring data.
Activity - 285 Nest structures							
	5.51	$1,073.40	$125.99	$777.79	$1,977.18	50	Maintained and monitored 50 wood duck nest boxes on area waterways.
Species 9222 Total	7.74	$1,448.79	$175.18	$845.74	$2,469.71		
Species 9226 - Mourning and white-winged doves (migratory and non-migratory							
Activity - 221 Animal surveys							
	2.12	$429.57	$14.67	$0.00	$444.24	0	Trapped and banded

	Man Days	Salary	FuelCost	Other	Total	Units	Accomplishments
							doves as part of a statewide project and nationwide effort.
Species 9226 Total	2.12	$429.57	$14.67	$0.00	$444.24		
Species 9240 - Nongame wildlife							
Activity - 221 Animal surveys							
	25.85	$4,918.08	$1,158.49	$11,526.01	$17,602.58	0	Conducted herpetofaunal surveys (NFA), breeding bird point counts and monitored wading bird rookery.
Species 9240 Total	25.85	$4,918.08	$1,158.49	$11,526.01	$17,602.58		
Species 9251 - Songbirds (passerines)							
Activity - 285 Nest structures							
	0.85	$162.86	$23.30	$134.24	$320.40	0	Constructed, maintained and monitored bluebird nest boxes.
Species 9251 Total	0.85	$162.86	$23.30	$134.24	$320.40		
Species 9252 - Wading birds							
Activity - 182 Data management							
	0.23	$42.57	$2.59	$0.00	$45.16	0	Analyzed and summarized wading bird rookery monitoring data.
Activity - 221 Animal surveys							
	0.36	$66.16	$6.47	$61.43	$134.06	0	Monitored wading bird rookery.
Species 9252 Total	0.59	$108.73	$9.06	$61.43	$179.22		
Species 9254 - Breeding birds							

	Man Days	Salary	FuelCost	Other	Total	Units	Accomplishments
Activity - 182	Data management						
	0.11	$20.97	$2.59	$0.00	$23.56	0	Analyzed and summarized breeding bird point count data.
Activity - 221	Animal surveys						
	1.12	$215.19	$18.12	$161.64	$394.95	0	Conducted breeding bird point count surveys.
Species 9254 Total	1.23	$236.16	$20.71	$161.64	$418.51		
Species 9258 - Southeastern kestrel							
Activity - 285	Nest structures						
	1.88	$361.88	$47.89	$145.98	$555.75	0	Constructed, maintained and monitored kestrel nest boxes.
Species 9258 Total	1.88	$361.88	$47.89	$145.98	$555.75		
Species 9278 - Gopher tortoise							
Activity - 140	Report writing/editing/manuscript preparation						
	5.00	$975.20	$89.74	$525.15	$1,590.09	0	Prepared annual progress report on gopher tortoise surveying and monitoring efforts. NFA.
Activity - 182	Data management						
	0.89	$167.84	$46.17	$430.81	$644.82	0	Summarized and analyzed annual gopher tortoise surveying and monitoring data. NFA.
Activity - 221	Animal surveys						
	4.87	$880.63	$179.06	$2,245.51	$3,305.20	0	Coordinated and conducted gopher tortoise surveys. NFA.

	Man Days	Salary	FuelCost	Other	Total	Units	Accomplishments
Species 9278 Total	10.76	$2,023.67	$314.97	$3,201.47	$5,540.11		
Species 9280 - All threatened and endangered wildlife							
Activity - 182 Data management							
	0.25	$47.52	$1.73	$0.00	$49.25	0	Summarized and analyzed herpetofauna surveying and monitoring data. NFA.
Activity - 221 Animal surveys							
	0.00	$0.00	$86.29	$1,390.81	$1,477.10	0	Conducted herpetofaunal surveys with emphasis on imperiled species. NFA.
Species 9280 Total	0.25	$47.52	$88.02	$1,390.81	$1,526.35		
Species 9291 - Bald eagle							
Activity - 221 Animal surveys							
	0.50	$83.04	$10.36	$0.00	$93.40	0	Monitored and assessed the annual status of known bald eagle nests on Econfina Creek WMA.
Species 9291 Total	0.50	$83.04	$10.36	$0.00	$93.40		
Project 7281 Total	244.53[1]	$48,217.89	$8,495.57	$79,337.01	$136,050.47		

[1]Man-days for OPS Fish & Wildlife Technician (~210 man-days) and OPS Hunting & Fishing Check Station Operators (~382 man-days) not included. However, salary for such is included in "Other" expenses category.

Appendix III. Average percent occurrence of fish species sampled via fyke nets October 2010 and April 2011 on Black, Dry, and Green Ponds at the Carter Tract of Econfina Creek WMA, Washington County, Florida.

OCTOBER 2010				
Species	Green 3	Green 1&2	Black Pond	Dry Pond
Warmouth	18.5%	21.4%	5.2%	31.6%
Bluegill	1.2%	14.5%	14.3%	3.0%
Largemouth Bass	0.0%	0.0%	0.0%	0.0%
Swampdarter	0.0%	1.5%	1.0%	0.0%
Flier	8.6%	6.9%	0.0%	2.2%
Lake chubsucker	14.1%	1.7%	0.0%	1.7%
Brown bullhead	1.8%	0.0%	1.8%	0.0%
E. starhead topminnow	9.5%	5.9%	31.8%	33.7%
Mosquitofish	0.0%	1.1%	7.0%	1.3%
Gar	0.0%	0.0%	1.0%	0.4%
Chain pickerel	11.1%	2.8%	18.4%	2.9%
Yellow bullhead	0.0%	0.0%	0.0%	0.0%
Blue-spotted sunfish	6.2%	38.1%	1.0%	10.8%
Dollar sunfish	17.9%	6.2%	18.5%	8.5%
Brook silverside	0.0%	0.0%	0.0%	0.0%
Pygmy sunfish	0.0%	0.0%	0.0%	0.0%
Pygmy killifish	0.0%	0.0%	0.0%	0.0%
Lined topminnow	11.1%	0.0%	0.0%	0.0%
APRIL 2011				
Species	Green 3	Green 1&2	Black Pond	Dry Pond
Warmouth	9.8%	7.8%	3.0%	4.7%
Bluegill	3.4%	0.8%	24.8%	3.0%
Largemouth Bass	4.7%	0.5%	0.9%	0.5%
Swampdarter	0.0%	0.6%	0.0%	0.0%
Flier	0.5%	0.4%	0.0%	0.3%
Lake chubsucker	0.8%	1.5%	2.0%	3.1%
Brown bullhead	0.0%	0.0%	0.0%	0.0%
E. starhead topminnow	32.4%	39.0%	13.5%	16.1%
Mosquitofish	18.1%	23.3%	13.9%	18.7%
Gar	0.4%	0.3%	0.0%	0.6%
Chain pickerel	0.8%	1.4%	0.0%	0.9%
Yellow bullhead	0.0%	0.0%	0.2%	0.4%
Blue-spotted sunfish	4.1%	21.1%	14.0%	28.6%
Dollar sunfish	24.6%	3.1%	27.7%	25.2%
Brook silverside	0.3%	0.0%	0.0%	0.0%
Pygmy sunfish	0.2%	0.1%	0.0%	0.0%
Pygmy killifish	0.0%	0.1%	0.0%	0.0%

Appendix IV. Catch-per-unit-effort (CPUE) results for sportfish sampled via electrofishing at Black, Dry, and Green Ponds in October 2010 and April 2011 on Carter Tract of Econfina Creek WMA, Washington County, Florida.

Fall 2010	Black Pond		Dry Pond		Green Ponds	
Species	N[a]	CPUE[b]	N[a]	CPUE[b]	N[a]	CPUE[b]
Bluegill	44	0.88	8	0.15	11	0.28
Largemouth bass	14	0.28	2	0.04	2	0.05
Warmouth	8	0.16	12	0.22	1	0.03
Black Crappie	0	0	0	0	0	0
TOTALS	66	1.34	22	0.4	14	0.35

[a]**Number of fish sampled**
[b]**Catch per unit effort (CPUE) measured in weight of fish/minute**

Spring 2011	Black Pond		Dry Pond		Green Ponds	
Species	N[a]	CPUE[b]	N[a]	CPUE[b]	N[a]	CPUE[b]
Bluegill	45	0.90	7	0.12	23	0.51
Largemouth bass	7	0.14	10	0.17	5	0.11
Warmouth	2	0.04	4	0.07	3	0.07
Black Crappie	9	0.18	0	0.00	3	0.07
TOTALS	63	1.26	21	0.36	34	0.76

[a]**Number of fish sampled**
[b]**Catch per unit effort (CPUE) measured in weight of fish/minute**

Appendix V. Excerpt from one of several newspaper articles touting the Carter Tract public fishing program, July 2010.

NEWSHERALD.com
PANAMA CITY

Outdoor Life: WMA ponds producing fine bream

SCOTT LINDSEY / Outdoors Writer
2010-07-27 11:55:19

Stan and Georgia Cooper caught some fine bream recently in the lakes of the Fitzhugh Carter Tract Econfina Creek WMA. If you are not familiar with this area, I will give you information on how to get to it a little later.

This part of Washington County is located on the headwaters of Pine Log Creek below Vernon. The state acquired the land from the Carter family a few years back, and wanted to preserve it as it was before Mr. Carter owned the land. At the time it was opened to the public there were big plans for the fishing and hunting, but there also was one of the biggest droughts we'd had in awhile.

The aim was to make the place accessible to the public, but not allow so many people on the water at one time that they would get in each other's way.

Boats on trailers were prohibited with only canoes, kayaks and boats that could be transported in the back of a pickup truck allowed. The reasoning was to prevent invasive plants and animals from being picked up in one lake and transported to another.

The state cut roads to each lake and provided many of the bigger lakes, such as Green Lake, Dry Lake and Black Pond with boats the public could fish from. These boats are free to the public. The problem was the water was very low and some lakes no longer connected. To launch a boat from a truck you sometimes had to drag it a good ways.

The fish were there, but the project didn't progress like the state planned. What we needed was rain and lots of it. It certainly was possible to catch some fine bass and bream out of these ponds, but on some you had to walk the bank and bank fishing didn't seem to get the same results.

I learned a lesson about fish bait on the banks of the Deep Edge Pond one spring. I was using crickets that had caught more bream than any bait thrown in the water, but the bream wouldn't cooperate. It was getting hot, and I was about to leave when a couple and their son came by and asked if I minded them fishing in the spot where I was. I was not catching anything.

They whipped out a big old coffee can and inside were catalpas. I watched as they caught one bream after another. The limit is 20 and they had that in no time. As they left they offered their catalpas to me. I grabbed that can and resumed fishing.

I cut the worms in half to be able to catch more fish. A catalpa worm is as tough as shoe leather and it is possible to catch multiple bream on just one worm, which I did.

Those fish still are there and they are biting. The Coopers have gone to these lakes several times fishing with ultra-light spinning reels and fly rods and are catching bream any fisherman would be proud of.

Which pond they caught them from I do not know, but if you drive there and take a look you would believe any one of these ponds could produce. The rains we had last year raised all the water levels and there is water where there once was dry land.

If you would like to fish these ponds travel north on State 77 from Panama City until you reach Greenhead and turn left (west) on the first paved road. Travel a short distance and you will see a sign on the right indicating the place to turn in. You will come to a prefab trailer where you check in.

They are open from Friday until Monday. Remember, don't drag your boat up there if it is on a trailer because they will not allow a trailer in these lakes.

Appendix VI. Number of fish caught and released per pond from July 2010- June 2011 on the Carter Tract of Econfina Creek WMA, Washington County, Florida.

Species		Dry	Black	Green 3	Green 2	Green 1	Deep Edge	Powerline	All Ponds
Bluegill (*Lepomis macrochirus*)									
	Kept	526	389	72	48	34	25	6	1100
	Released	688	676	75	77	51	61	84	1712
	Total caught	**1214**	**1065**	**147**	**125**	**85**	**86**	**90**	**2812**
Black Crappie (*Pomoxis nigromaculatus*)									
	Kept	337	81	110	32	24	0	0	584
	Released	128	34	31	4	5	0	0	202
	Total caught	**465**	**115**	**141**	**36**	**29**	**0**	**0**	**786**
Largemouth Bass† (*Micropterus salmoides*)									
	Total caught	**315**	**79**	**129**	**41**	**13**	**78**	**12**	**667**
Warmouth (*Lepomis gulosus*)									
	Kept	30	2	0	1	6	0	0	39
	Released	45	15	6	10	4	5	0	85
	Total caught	**75**	**17**	**6**	**11**	**10**	**5**	**0**	**124**
Catfish (*Ameirus nebulosus* and *Ameirus natalis*)									
	Kept	5	1	**4**	0	0	**0**	**0**	10
	Released	23	3	0	1	0	0	26	53
	Total caught	**28**	**4**	**4**	**1**	**0**	**0**	**26**	**63**
Other (Chain pickerel, Bowfin, etc.)									
	Kept	6	10	3	0	1	0	0	20
	Released	102	57	77	27	24	0	3	290
	Total caught	**108**	**67**	**80**	**27**	**25**	**0**	**3**	**310**
Total catch (all species)		**2205**	**1347**	**507**	**241**	**162**	**169**	**131**	**4762**

†Largemouth Bass are catch-and-release only on Carter Tract ponds

Appendix VII. Percent nest success, average clutch size, and estimated duckling survival/clutch of wood duck (*Aix sponsa*) nest boxes (2006-2011) by water body on the Carter Tract of Econfina Creek WMA, Washington County, Florida.

Year	Water Body									
2006	Green 1&2	Green 3	Deep Edge	Black	LDE	Dry	Garrett	Warmouth	PLC	All Water Bodies
% nest success	0%	0%	0%	0%	50%	0%	100%	0%	0%	33%
average eggs/clutch	0.0	9.5	0.0	0.0	8.0	0.0	5.0	0.0	9.0	8.2
hatched ducklings/clutch	0.0	0.0	0.0	0.0	1.5	0.0	3.0	0.0	0.0	1.0
2007										
% nest success	0%	33%	0%	0%	50%	0%	0%	0%	0%	18%
average eggs/clutch	0.0	0.7	4.5	0.0	6.0	11.0	0.0	0.0	0.0	6.8
hatched ducklings/clutch	0.0	0.7	0.0	0.0	1.5	0.0	0.0	0.0	0.0	1.0
2008										
% nest success	0%	0%	0%	0%	0%	100%	0%	0%	0%	40%
average eggs/clutch	6.0	0.0	0.0	0.0	0.0	10.3	0.0	0.0	0.0	9.4
hatched ducklings/clutch	0.0	0.0	0.0	0.0	0.0	6.3	0.0	0.0	0.0	5.0
2009										
% nest success	33%	25%	0%	50%	0%	78%	0%	0%	0%	57%
average eggs/clutch	6.3	6.5	6.0	6.8	12.0	10.0	0.0	0.0	0.0	8.4
hatched ducklings/clutch	0.3	1.5	0.0	2.7	0.0	4.6	0.0	0.0	0.0	2.7
2010										
% nest success	40%	33%	100%	40%	0%	50%	100%	0%	50%	48%
average eggs/clutch	7.2	7.5	8.0	6.6	0.0	8.9	9.0	0.0	8.0	7.8
hatched ducklings/clutch	3.0	1.7	6.0	2.0	0.0	2.1	7.0	0.0	3.5	2.7
2011										
% nest success	50%	60%	100%	80%	50%	43%	100%	0%	0%	62%
# nests	4	5	2	5	2	7	1	0	0	26
average eggs/clutch	5.5	7.2	5.5	11	10	5.6	9	0	0	7.4
hatched ducklings/clutch	2.75	3.6	4	6.4	1.5	1.57	9.00	0.00	0.00	3.40

LDE = Little Deep Edge Pond
PLC = Pine Log Creek

Appendix VIII. Bird species (n=120) documented on the Carter Tract of Econfina Creek WMA, as of June 2011.

PODICIPEDIFORMES
- **Podicipedidae (Grebes)**
  - ☐ Pied-billed Grebe *Podilymbus podiceps*

PELICANIFORMES
- **Phalacrocoracidae (Cormorants)**
  - ☐ Double-crested Cormorant *Phalacrocorax auritus*
- **Anhingidae (Darters/Anhinga)**
  - ☐ Anhinga *Anhinga anhinga*

CICONIIFORMES
- **Ardeidae (Herons, Egrets, and Bitterns)**
  - ☐ Great Blue Heron *Ardea herodias*
  - ☐ Great Egret *Ardea alba*
  - ☐ Snowy Egret *Egretta thula*
  - ☐ Little Blue Heron *Egretta caerulea*
  - ☐ Tricolored Heron *Egretta tricolor*
  - ☐ Cattle Egret *Bubulcus ibis*
  - ☐ Green Heron *Butorides virescens*
- **Threskiornithidae (Ibises and Spoonbills)**
  - ☐ White Ibis *Eudocimus albus*
  - ☐ Roseate Spoonbill *Platalea ajaja*
- **Ciconiidae (Storks)**
  - ☐ Wood Stork *Mycteria americana*
- **Cathartidae (New World Vultures)**
  - ☐ Black Vulture *Coragyps atratus*
  - ☐ Turkey Vulture *Cathartes aura*

ANSERIFORMES
- **Anatidae (Ducks, Geese, and Swans)**
  - ☐ Snow Goose *Chen caerulescens*
  - ☐ Wood Duck *Aix sponsa*
  - ☐ Blue-winged Teal *Anas discors*
  - ☐ Green-winged Teal *Anas crecca*
  - ☐ Redhead *Aythya americana*
  - ☐ Ring-necked Duck *Aythya collaris*
  - ☐ Bufflehead *Bucephala albeola*
  - ☐ Hooded Merganser *Lophodytes cucullatus*
  - ☐ Ruddy Duck *Oxyura jamaicensis*

FALCONIFORMES
- **Accipitridae (Hawks and Allies)**
  - ☐ Osprey *Pandion haliatus*
  - ☐ Swallow-tailed Kite *Elanoides forficatus*
  - ☐ Bald Eagle *Haliaeetus leucocephalus*
  - ☐ Northern Harrier *Circus cyaneus*
  - ☐ Sharp-shinned Hawk *Accipiter striatus*
  - ☐ Cooper's Hawk *Accipiter cooperii*
  - ☐ Red-shouldered Hawk *Buteo lineatus*
  - ☐ Red-tailed Hawk *Buteo jamaicensis*
- **Falconidae (Falcons and Caracaras)**
  - ☐ American Kestrel *Falco sparverius*
  - ☐ Merlin *Falco columbarius*

GALLIFORMES
- **Phasianidae (Grouse, Turkeys, and Allies)**
  - ☐ Wild Turkey *Meleagris gallopavo*
- **Odontophoridae (New World Quail)**
  - ☐ Northern Bobwhite *Colinus virginianus*

GRUIFORMES
- **Rallidae (Rails, Gallinules, and Coots)**
  - ☐ Common Moorhen *Gallinula chloropus*
  - ☐ American Coot *Fulica Americana*
- **Gruidae (Cranes)**
  - ☐ Sandhill Crane *Grus Canadensis*

CHARADRIIFORMES
- **Charadriidae (Plovers and Lapwings)**
  - ☐ Killdeer *Charadrius vociferous*
- **Scolopacidae (Sandpipers, Phalaropes, and Allies)**
  - ☐ Greater Yellowlegs *Tringa melanoleuca*
  - ☐ Lesser Yellowlegs *Tringa flavipes*
  - ☐ Common Snipe *Gallinago gallinago*
  - ☐ American woodcock *Scolopax minor*
- **Laridae (Gulls, Terns, and Allies)**
  - ☐ Least Tern *Sterna antillarum*

COLUMBIFORMES
- **Columbidae (Pigeons and Doves)**
  - ☐ Mourning Dove *Zenaida macroura*
  - ☐ Common Ground Dove *Columbina passerina*

CUCULIFOMRES
- **Cuculidae (Cuckoos, Roadrunners, and Anis)**
  - ☐ Yellow-billed Cuckoo *Coccyzus americanus*

STRIGIFORMES
- **Strigidae (Typical Owls)**
  - ☐ Eastern Screech Owl *Megascops asio*
  - ☐ Great Horned Owl *Bubo virginianus*
  - ☐ Barred Owl *Strix varia*

CAPRIMULGIFORMES
- **Caprimulgidae (Nighthawks and Nightjars)**
  - ☐ Common Nighthawk *Chordeiles minor*
  - ☐ Chuck-will's-widow *Caprimulgus carolinensis*

APODIFORMES
- **Apodidae (Swifts)**
  - ☐ Chimney Swift *Chaetura pelagica*
- **Trochilidae (Hummingbirds)**
  - ☐ Ruby-throated Hummingbird *Archilochus colubris*

CORACIIFORMES
- **Alcedinidae (Kingfishers)**
  - ☐ Belted Kingfisher *Ceryle alcyon*

PICIFORMES
- **Picidae (Woodpeckers and Allies)**
  - ☐ Red-headed Woodpecker *Melanerpes erythrocephalus*
  - ☐ Red-bellied Woodpecker *Melanerpes carolinus*
  - ☐ Yellow-bellied Sapsucker *Sphyrapicus varius*
  - ☐ Downy Woodpecker *Picoides pubescens*
  - ☐ Hairy Woodpecker *Picoides villosus*
  - ☐ Northern Flicker *Colaptes auratus*
  - ☐ Pileated Woodpecker *Dryocopus pileatus*

PASSERIFORMES
- **Tyrannidae (Tyrant Flycatchers)**
  - ☐ Eastern Phoebe *Sayornis phoebe*
  - ☐ Great Crested Flycatcher *Myiarchus crinitus*
  - ☐ Eastern Kingbird *Tyrannus tyrannus*
- **Laniidae (Shrikes)**
  - ☐ Loggerhead Shrike *Lanius ludovicianus*
- **Vireonidae (Vireos)**
  - ☐ White-eyed Vireo *Vireo griseus*
  - ☐ Red-eyed Vireo *Vireo olivaceus*
- **Corvidae (Crows and Jays)**
  - ☐ Blue Jay *Cyanocitta cristata*
  - ☐ American Crow *Corvus brachyrhynchos*
  - ☐ Fish Crow *Corvus ossifragus*
- **Hyrundinidae (Swallows and Martins)**
  - ☐ Purple Martin *Progne subis*
  - ☐ Tree Swallow *Tachycineta bicolor*
  - ☐ Northern Rough-winged Swallow *Stelgidopteryx serripennis*
  - ☐ Barn Swallow *Hirundo rustica*

Appendix VIII (continued)

PASSERIFORMES (continued)

Paridae (Chickadees and Titmice)
- ☐ Carolina Chickadee *Poecile carolinensis*
- ☐ Tufted Titmouse *Baeolophus bicolor*

Sittidae (Nuthatches)
- ☐ Brown-headed Nuthatch *Sitta pusilla*

Troglodytidae (Wrens)
- ☐ Carolina Wren *Thryothorus ludovicianus*
- ☐ Marsh Wren *Cistothorus palustris*

Regulidae (Kinglets)
- ☐ Golden-crowned Kinglet *Regulus satrapa*
- ☐ Ruby-crowned Kinglet *Regulus calendula*

Sylviidae (Old World Warblers and Gnatcatchers)
- ☐ Blue-gray Gnatcatcher *Polioptila caerulea*

Turdidae (Thrushes)
- ☐ Eastern Bluebird *Sialia sialis*
- ☐ Hermit Thrush *Catharus guttatus*
- ☐ Wood Thrush *Hylocichla mustelina*
- ☐ American Robin *Turdus migratorius*

Mimidae (Mockingbirds and Thrashers)
- ☐ Gray Catbird *Dumetella carolinensis*
- ☐ Northern Mockingbird *Mimus polyglottos*
- ☐ Brown Thrasher *Toxostoma rufum*

Bombycillidae (Waxwings)
- ☐ Cedar Waxwing *Bombycilla cedrorum*

Parulidae (Wood-Warblers)
- ☐ Orange-crowned Warbler *Vermivora celata*
- ☐ Northern Parula *Parula Americana*
- ☐ Yellow-rumped Warbler *Dendroica coronata*
- ☐ Yellow-throated Warbler *Dendroica dominica*
- ☐ Pine Warbler *Dendroica pinus*
- ☐ Prairie Warbler *Dendroica discolor*
- ☐ Palm Warbler *Dendroica palmarum*
- ☐ Black-and-white Warbler *Mniotilta varia*
- ☐ Prothonotary Warbler *Protonotaria citrea*
- ☐ Common Yellowthroat *Geothlypis trichas*
- ☐ Hooded Warbler *Wilsonia citrine*

Thraupidae (Tanagers)
- ☐ Summer Tanager *Piranga rubra*
- ☐ Scarlet Tanager *Piranga olivacea*

Emberizidae (New World Sparrows)
- ☐ Eastern Towhee *Pipilo erythrophthalmus*
- ☐ Chipping Sparrow *Spizella passerine*
- ☐ Field Sparrow *Spizella pusilla*
- ☐ White-throated Sparrow *Zonotrichia albicollis*
- ☐ White-crowned Sparrow *Zonotrichia leucophrys*
- ☐ Dark-eyed Junco *Junco hyemalis*

Cardinalidae (Cardinals and Allies)
- ☐ Northern Cardinal *Cardinalis cardinalis*
- ☐ Rose-breasted Grosbeak *Pheucticus ludovicianus*
- ☐ Blue Grosbeak *Passerina caerulea*
- ☐ Indigo Bunting *Passerina cyanea*

Icteridae (Blackbirds, Orioles, and Allies)
- ☐ Red-winged Blackbird *Agelaius phoeniceus*
- ☐ Eastern Meadowlark *Sturnella magna*
- ☐ Common Grackle *Quiscalus quiscula*
- ☐ Brown-headed Cowbird *Molothrus ater*
- ☐ Orchard Oriole *Icterus spurious*

TOTAL NUMBER OF BIRD SPECIES = 120

* NOTE: species in red were previously undocumented prior July 2010

Appendix IX. Wading bird survey results (2008-11) from Little Deep Edge Pond rookery at the Carter Tract of Econfina Creek WMA, Washington County, FL.

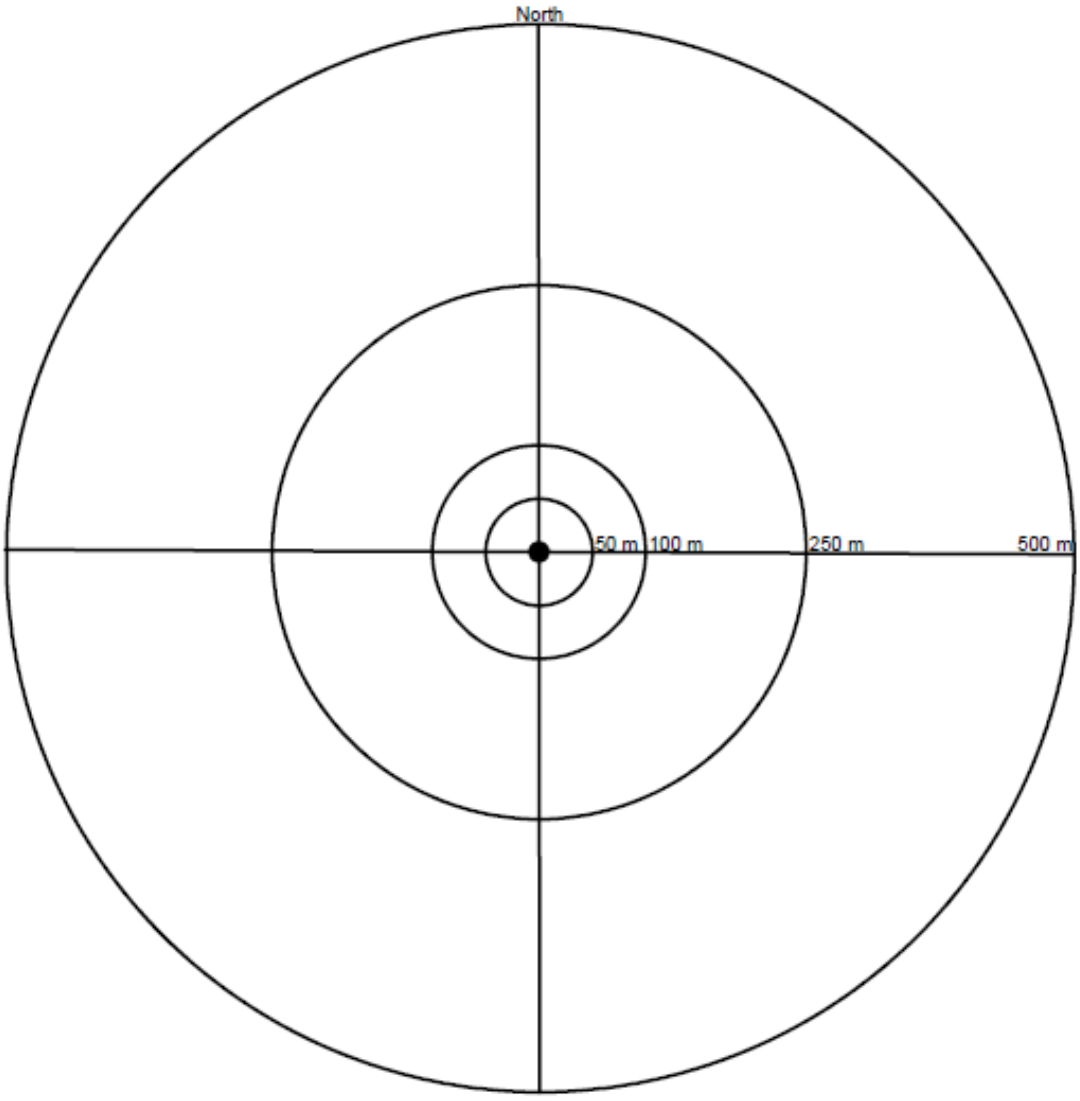
Species	Year	Number of Birds Observed		
Anhinga (*Anhinga anhinga*)		Adults	Nesting	Chicks
	2008	6	3	0
	2009	3	unknown	3
	2010	2	0	0
	2011	2	0	0
Cattle Egret (*Bubulcus ibis*)	2008	25	18	0
	2009	0	0	0
	2010	0	0	0
	2011	14	12	24
Great Egret (*Ardea alba*)	2008	13	10	10
	2009	31	8	12
	2010	8	6	9
	2011	14	11	17
Little Blue Heron (*Egretta caerulea*)	2008	8	3	0
	2009	1	0	0
	2010	0	0	0
	2011	20	14	34
Tricolored Heron (*Egretta tricolor*)	2008	2	unknown	0
	2009	0	0	0
	2010	0	0	0
	2011	1	1	1
Snowy Egret (*Egretta thula*)	2008	0	0	0
	2009	3	0	0
	2010	0	0	0
	2011	2	2	5
Green Heron (*Butorides virescens*)	2008	1	0	1
	2009	2	unknown	1
	2010	1	0	0
	2011	0	0	0
Great Blue Heron (*Ardea herodias*)	2008	0	0	0
	2009	0	0	0
	2010	1	0	0
	2011	0	0	0

Appendix X. Field data sheet used for conducting early morning autumn call counts for quail coveys on the Carter Tract of Econfina Creek WMA, Washington County, Florida.

Early Morning Covey Call Point Count Field Sheet

State _____ Study Area _____ Point # _____ Date _____ Observer _____ % Cloud _____ Wind (km/hr) _____

Total Covey Count _____ 50 m count _____ 100 m count _____ 250 m count _____ 500 m count _____ >500 m Count _____



Comments: _____

_____

UTM Easting (Lon) :_____ UTM Northing (Lat):_____ Zone:_____

Appendix XI. Comprehensive list of herpetofaunal species (n=49) documented on the Carter Tract of Econfina Creek WMA, 2005 – present (species in red denote previously undocumented species confirmed during 2010 - 11 surveys).

Salamanders

Mole salamander *Ambystoma talpoideum*
Central newt *Notophthalmus viridescens louisianensis*
Dwarf salamander *Eurycea quadridigitata*
Slimy salamander *Plethodon grobmani*
Eastern Lesser siren *Siren intermedia intermedia*
Greater siren *Siren lacertina*
Two-toed Amphiuma *Amphiuma means*

Anurans

Eastern Spadefoot toad *Scaphiopus holbrooki*
Bullfrog *Rana catesbeiana*
Pig frog *Rana grylio*
Southern Leopard frog *Rana sphenocephala*
Eastern Narrowmouth toad *Gastrophryne carolinensis*
Southern Chorus frog *Pseudacris nigrita nigrita*
Southern toad *Bufo terrestris*
Florida Cricket frog *Acris gryllus dorsalis*
Green treefrog *Hyla cinerea*
Barking treefrog *Hyla gratiosa*
Oak toad *Bufo quercicus*
Northern cricket frog *Acris crepitans*
River frog *Lithobates heckscheri*

Crocodilians

American alligator *Alligator mississippiensis*

Turtles

Florida cooter *Pseudemys floridana floridana*
Eastern Chicken turtle *Deirochelys reticularia reticularia*
Three-Toed Box turtle *Terrapene carolina triunguis*
Gopher tortoise *Gopherus polyphemus*
Florida softshell *Apalone ferox*
Gulf Coast Box turtle *Terrapene carolina major*
Florida Box turtle *Terrapene carolina bauri*
Common Musk Turtle *Sternotherus odoratus*
Yellow-bellied Slider *Trachemys scripta*

Lizards

Green anole *Anolis carolinensis*
Southern Fence lizard *Sceloporus undulatus undulatus*
Six-lined racerunner *Cnemidophorus sexlineatus sexlineatus*
Southeastern Five-lined skink *Eumeces inexpectatus*
Ground skink *Scincella lateralis*
Northern Mole Skink *Eumeces egregius similis*
Broadhead Skink *Eumeces laticeps*

Snakes

Southern Black racer *Coluber constrictor priapus*
Banded Water snake *Nerodia fasciata fasciata*
Rough Green snake *Opheodrys aestivus*
Eastern Garter snake *Thamnophis sirtalis sirtalis*
Cottonmouth *Agkistrodon piscivorous*
Eastern Diamondback Rattlesnake *Crotalus adamanteus*
Dusky Pigmy Rattlesnake *Sistrurus miliarius barbouri*
Gray Rat Snake *Elaphe obsoleta spiloides*
Florida Pine Snake *Pituophis melanoleucus*
Eastern Hognose Snake *Heterodon platyrhinos*
Corn Snake *Elaphe guttata guttata*
Eastern Coachwhip *Masticophis flagellum*
Scarlet Snake *Cemophora coccinea*
Mud Snake *Farancia abacura*
Florida Green Water Snake *Nerodia floridana*
Eastern Coral Snake *Micrurus fulvius*

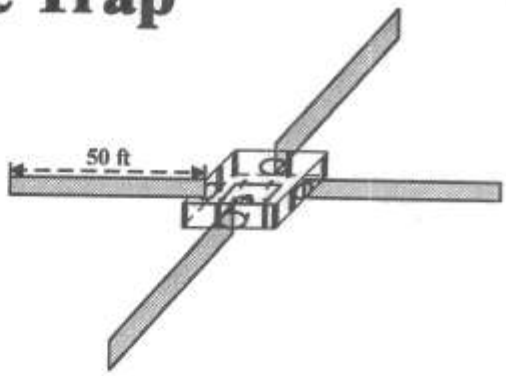
****RED denotes previously unconfirmed species found during 2009-2010**

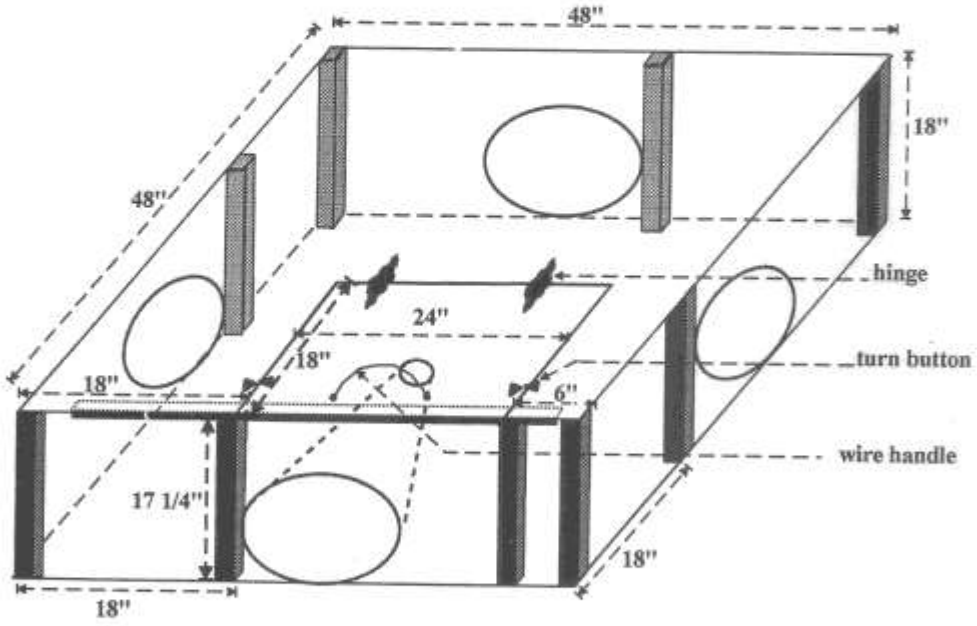
Appendix XII. General design and dimensions of upland snake traps used at the Carter Tract from March – July 2010 (NOTE: Actual trap and array dimensions differ slightly from those described below).

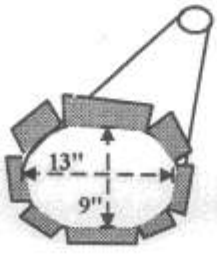
Snake Trap

Materials

1/2" sheet of treated plywood	(1)
2"x2"x8' treated lumber	(2)
1"x2"x4' treated lumber	(1)
1/4"x1/4" hardware cloth 24" high	
100 ft roll	(2)
28 ft peice	(1)
3" strap hinge	(2)
turn button	(2)
20ga galvanized wire 50ft	(1)
nails	
heavy duty staple gun and staples	







Roll 30" x 18" piece of hardware cloth into funnel and trim excess.

Slide funnel through hole in hardware cloth on side of trap and wire into place securely.

Appendix XIII. Snake trap array capture results from July 2010 – June 2011on the Carter Tract of Econfina Creek WMA, Washington County, Florida.

Reptiles	**Number captured**
Green anole (*Anolis carolinensis)*	2
Six-line racerunner (*Cnemidophorus sexlineatus*)	66
Southern black racer (*Coluber constrictor priapus*)	21
Eastern diamondback rattlesnake (*Crotalus adamanteus*)	2
Corn snake (*Elaphe guttata guttata*)	8
Northern mole skink (*Eumeces egregius similis*)	1
Southeastern five-lined skink (*Eumeces inexpectatus*)	5
Unidentifiable skink *(Eumeces* spp.)	4
Eastern hognose snake (*Heterodon platyrhinos*)	9
Eastern coachwhip *(Masticophis flagellum*)	16
Dusky pigmy rattlesnake *(Sistrurus miliarius barbouri*)	11
Eastern fence lizard (*Sceloporus undulatus*)	48
Eastern garter snake (*Thamnophis sirtalis sirtalis*)	1
Broadhead skink (*Eumeces laticeps*)	2
TOTAL REPTILES	196
REPTILE SPECIES	14

Amphibians	**Number captured**
Mole salamander (*Ambystoma talpoideum*)	1
Florida cricket frog (*Acris gryllus dorsalis*)	1
Oak toad (*Bufo quercicus*)	10
Southern toad (*Bufo terrestris*)	43
Eastern narrowmouth toad (*Gastrophryne carolinensis*)	37
Eastern spadefoot toad (*Scaphiopus holbrookii*)	21
Southern leopard frod (*Rana sphenocephala*)	3
Pig frog (*Rana grylio*)	6
Bullfrog (*Rana catesbeiana*)	1
Unidentifiable toad (*Bufo* spp.)	1
TOTAL AMPHIBIANS	124
AMPHIBIAN SPECIES	10

Mammals	**Number captured**
Southeastern shrew (*Sorex longirostris*)	1
Eastern woodrat (*Neotoma floridana*)	1
Oldfield mouse (*Peromyscus polionotus*)	12
Cotton mouse (*Peromyscus gossypinus*)	1
Golden mouse (*Ochrotomys nuttalli*)	2
TOTAL MAMMALS	17
MAMMAL SPECIES	5

Birds	**Number captured**
Northern bobwhite (*Colinus virginianus*)	3
TOTAL BIRDS	3
BIRD SPECIES	1
TOTAL ALL TAXA	**340**
TOTAL SPECIES	**30**

NOTE: species in red were previously undocumented prior to the 2010 trapping effort

Appendix IVX. Turtle trap capture results from March - April 2011 on the Carter Tract of Econfina Creek WMA, Washington County, Florida.

Turtle Species	Number of Captures
Florida Softshell Turtle (*Apalone ferox*)	20
Yellow-bellied slider (*Trachemys scripta*)	19
Chicken Turtle (*Dierochelys reticularia*)	1
Common Musk Turtle (*Sternotherus odoratus*)	1
TOTAL	**41**

Non-target species	Number of Captures
American Alligator (*Alligator mississipiensis*)	3
Bluegill (*Lepomis macrochirus*)	1
Lake Chubsucker (*Erimyzon sucetta*)	1
Warmouth (*Lepomis gulosus*)	1
Yellow bullhead (*Ameirus natalis*)	1
Black Crappie (*Pomoxis nigromaculatus*)	5
Brown Bullhead (*Ameirus nebulosus*)	5
Largemouth Bass (*Micropterus salmoides*)	5
Bullhead (unk species)	3
Chain Pickerel (*Esox niger*)	2
TOTAL	**27**