Annual Report

The 2003 Alligator Survey Network Monitoring Program: Relative Distribution, Abundance, and Demographic Structure of the American Alligator In Relation to Habitat, Water Level, and Salinities

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Introduction

The American Alligator (*Alligator mississippiensis*) was abundant in the pre-drainage Everglades. Alligators once occupied all wetland habitats in South Florida, from sinkholes and ponds in pinelands to mangrove estuaries during periods of freshwater discharge (Craighead 1968, Simmons and Ogden 1998). Nearly all aquatic life in the Everglades are affected by alligators (Beard 1938). As a top predator in their ecosystem, alligators undergo an extraordinary change in body size, consuming different prey items as they grow (Mazzotti and Brandt 1994). As ecosystem engineers, alligators create trails and holes that provide aquatic refugia during the dry season and concentrate food items for larger predators. Alligator nests provide elevated areas for nests of turtles and snakes, and for germination of plants less tolerant of flooding (Craighead 1971, Kushlan and Kushlan 1980, Enge et al. 2000). Alligator activity also keeps many small creeks in the freshwater mangrove zone, gator hole sites, and areas around tree islands from becoming overgrown with vegetation. It is possible that this activity creates firebreaks that provide protection for woody vegetation and various animal species (Craighead 1968, Simmons and Ogden 1998). Water present in holes during the dry season provides critical habitat for nesting female and juvenile alligators (Mazzotti 1989, Kushlan and Jacobsen 1990) and provides open water necessary for alligator mating (Garrick and Lang 1975).

In Everglades National Park, the largest historical alligator populations occurred in in broad shallow marl prairies to the east and west of the deep water habitats, and in the mangrove fringe area. Land development and water management practices have reduced the spatial extent and changed the hydro patterns of these habitats (Mazzotti and Brandt 1994). As a result of these habitat alterations, alligators are now certainly less numerous in the prairies, rocky glades, and mangrove fringe areas. For alligators, an important alteration was the construction of canals. Alligators initially displaced by development or drainage resided in canals. The effects of artificial habitats such as canals on creation and maintenance of alligator holes had not been studied until recently. The canals within the Everglades serve as alligator refugia throughout the greater Everglades ecosystem. Adult alligator density (especially of males) is higher in canal habitats than in the natural marsh interior (FFWCC unpub. Data, Morea 1999). The canals may provide suitable habitat for large alligators, but unlike alligator holes, they are not suitable for smaller alligators, smaller marsh fish, or foraging wading birds. Though this trend may be remedied by proper management practices, characteristics of alligator habitats have changed with the creation of canal systems now present in the Florida Everglades (Kushlan 1974).

Restoration of hydrologic patterns and ecological function in the Everglades is now underway. Relationships among dry season refugia, aquatic fauna, wading birds, and alligators have been identified as key uncertainties in the Comprehensive Everglades Restoration Plan (CERP, U.S. Army Corps of Engineers 1999, RECOVER 2003). Due to the alligator's ecological importance and known sensitivity to hydrology, salinity, habitat productivity, and total system productivity, the species was chosen as an indicator of restoration success. A number of biological attributes (relative density, relative body condition, nesting effort, and nesting success) can be measured, standardized methods for monitoring have been developed, and historical information exists for alligator populations in the Everglades. These attributes can be used to determine success at different spatial and temporal scales, and are instrumental for constructing ecological models used to predict restoration effects. The relative abundance of alligators is expected to increase as hydrologic conditions improve in over-drained marshes and freshwater tributaries. As canals are removed, densities of alligators in adjacent marshes and occupancy of alligator holes is expected to increase. As hydroperiods and depths approach more natural patterns, nesting success, alligator growth, and body condition are all expected to improve in geographical areas where these factors are presently below historic values.

Objectives

The objective of this project is to evaluate relative distribution, abundance, and demographic structure of alligators in various habitats in relation to water levels and salinities. Relative distribution and abundance of alligators is a key indicator component of the conceptual ecosystem models for the marl prairie/rocky glades, ridge and slough, and mangrove transition zone ecosystems and has been identified as a performance measure in the CERP monitoring and assessment plan. Demographic data is needed for development of models to assess the potential impacts from the operation of CERP projects (CERP science objective 3004-3)

As important as alligators are in the Everglades ecosystem, surprisingly little is known about them outside of Everglades National Park (ENP). In this ongoing project, alligator surveys are conducted from A.R.M. Loxahatchee National Wildlife Refuge (LOX) through Water Conservation Areas (WCA) 2 and 3, ENP to Florida Bay and the Gulf of Mexico. The alligator survey network described above is the first system-wide, systematic effort to examine Everglades alligators. Perhaps the most important aspect of the proposed continuation of the alligator survey network is its contribution to evaluating CERP projects.

There are two critical CERP issues to which the alligator survey network can provide information required for making policy decisions. They are:

1. How do canals affect alligator populations, and more importantly, how will the removal of canals affect alligator populations and subsequently the surrounding marsh habitat?
2. Alligators were formerly abundant in fresh and brackish water tidal areas of Everglades National Park. An identified weakness of CERP is the lack of evidence for significant improvement of freshwater deliveries to estuarine areas, especially those draining into the Gulf of Mexico. Because the distribution and abundance of alligators in estuaries is limited

by the availability of freshwater, restoring alligator populations within these estuarine systems would be an excellent indicator of restoration success.

Both issues require baseline data now in order to provide post restoration feedback to the policy making process. Without the alligator survey networks continuation next year, there will be insufficient baseline data for making before and after comparisons, and no useful input into the restoration process.

Night light surveys are a well-established, cost effective method for gathering the required information on relative abundance and distribution (Bayliss 1987, Woodward and Moore 1990). Additional population data will be gathered through capture surveys and subsequent body condition factor analysis (Leslie 1997, Zweig 2003).

Methods

Survey routes of estuarine rivers, freshwater canals, and marshes extending from the mangrove fringe of ENP north through WCA1 (LOX) were established in 2001-2002 (Figure 1). Changes were made to survey routes in 2003 including the addition of a new canal route along L-39 in LOX (Figure 1) and division of survey routes into10 km random transects, this based upon power analysis of past survey data. Each marsh route has been split into two distinct 10km transects along airboat trails with start points randomly selected. A minimum of one kilometer between transects was maintained and transects do not pass within one kilometer of a canal. Canal routes have only one 10 km transect selected for analysis. Marsh transects in WCA3A-TW are restricted to 6.75 and 7.0 km due to constraints of typical dry season water levels. The ENP-L67 canal transect is limited to 8.75km due to the removal of the levy south of the transect end point. After five years of data collection transect lengths and frequency will be statistically analyzed to ensure that they are appropriate for detecting system wide changes.

Spotlight surveys along routes are performed by skiff, airboat, or truck. Alligator locations are recorded using GPS (UTM Datum, WGS 84), sizes of alligators are estimated in quarter meter increments whenever possible. If size can not be estimated, animals are placed in small, medium, large or unknown size classes (Appendix 1). Environmental data including habitat type, air and water temperature, salinity, wind speed and wave height, and spot water levels are recorded at set locations along routes. Spotlight surveys in each area are conducted twice in both spring and fall at least 14 days apart in order to achieve independent counts (Woodward and Moore 1990). Spotlight surveys are conducted following guidelines set forth in the Alligator Survey Network Spotlight Survey Protocol (Appendix 1).

To determine condition of marsh alligator populations, semi-annual capture surveys are performed in the same areas as described above. Alligators are only captured in the marsh and estuarine habitats; animals observed in canals are not captured. A minimum of 15 alligators greater than .75m total length are captured by hand, noose or tongs in the fall and spring of each year. Total length (TL), snout-vent length (SVL), head length (HL), tail girth (TG), and weight are measured, sex determined, and any abnormalities/deformities noted. Alligators are tagged using GFC/FWC web tags or by clipping scutes to identify recaptured individuals. Geographic location, habitat characteristics, and environmental characteristics including air/water temperature, water depth, muck depth, and salinity are recorded where applicable. Data from these captures are used to assess relative condition using a condition factor analysis (Leslie 1997, Zweig 2003). In addition, blood was drawn from captured alligators in WCA2A and WCA3A in cooperation and at the request of the FFWCC Alligator Management Division for their statewide effort to assess and monitor the occurrence of West Nile Virus in alligator populations.

Staff gauges have been placed in 3-4 locations along each marsh survey route in WCA2A and WCA3A and monitored once monthly throughout 2003 for comparison to available regional hydrologic data. This data will be used in conjunction with existing hydrostation data to determine the proper dates to begin peak wet and dry season surveys. It is expected that the relationship between staff gauges and hydrostation data will allow for accurate estimates of past and future water levels along survey routes.

Results

Spotlight surveys for alligators were performed along fifteen established routes in marsh and canal habitats in LOX, WCA 2, 3, and in ENP during 2003 (Figure 1). Paired (marsh and canal) spotlight surveys were performed twice along each route in both spring (March/April) and fall (September/October) to coincide closely with peak wet and dry seasons. System wide there are 14 marsh, 8 canal, and 2 estuarine transects totaling 24 transects from 15 established survey routes. Alligator capture surveys were also performed in each of these marsh/estuarine habitats during the spring and fall of 2003.

2003 surveys in LOX included three routes; two marsh (LOX-M) and three canal transects (two in L-39 and one in L-40), all surveyed twice in both spring and fall. During spring surveys, the number of alligators observed with a total length ≥ 0.5m ranged from 46-78 in marsh transects, 130-170 for the L-40 canal transect, and 44-63 for the L-39 canal transects (Table 1). Spring alligator (0.5m and larger) densities ranged from 4.6-7.8/km in the marsh, 13.0-17.0/km in L-40, and 4.40-7.24/km in L-39 (Table 1). For fall surveys, the number of alligators observed with a total length ≥ 0.5m ranged from 44-57 in marsh transects, 38-68 in L-40, and 7-209 in L-39 transects (Table 2). Fall alligator (0.5m and larger) densities ranged from 4.4-5.7/km in the marsh, 3.8-6.8/km in L-40, and 0.7-20.9/km in L-39 (Table 2).

2003 surveys of WCA2A included two marsh and one canal transect surveyed twice in both spring and fall. During spring surveys, the number of alligators observed with a total length ≥ 0.5m ranged from 9-20 in marsh transects and 4-73 for the canal transect (Table 1). Spring alligator (0.5m and larger) densities ranged from 0.9-2.0/km in the marsh and 0.4-7.3/km in the canal (Table 1). For fall surveys, the number of alligators observed with a total length ≥ 0.5m ranged from 8-12 in marsh transects and 7-10 for the canal transect (Table 2). Fall alligator (0.5m and larger) densities ranged from 0.8-1.2/km in the marsh and 0.7-1.0/km in the canal (Table 2).

2003 surveys of WCA3A included six marsh and three canal transects (WCA3A-TW, WCA3A-HD, and WCA3A-N41) surveyed twice in both spring and fall. Marsh transects in WCA3A-TW are restricted to 6.75 (T-1) and 7.0 kilometers (T-2) due to constraints of typical dry season water levels. During spring surveys in WCA3A-TW, the number of alligators observed with a total length ≥ 0.5m ranged from 1-19 in marsh transects and 137-162 for the canal transect (Table 1). Spring alligator (0.5m and larger) densities in WCA3A-TW ranged from 0.15-2.71/km in the marsh and 13.7-16.2/km in the canal (Table 1). For fall surveys in WCA3A-TW, the number of alligators observed with a total length ≥ 0.5m ranged from 2-10 in marsh transects and 15-24 for the canal transect (Table 2). Fall alligator (0.5m and larger) densities in WCA3A-TW ranged from 0.30-1.43/km in the marsh and 1.5-2.4/km in the canal (Table 2). During spring surveys in WCA3A-HD, the number of alligators observed with a total length ≥ 0.5m ranged from 18-22 in marsh transects and 53-69 for the canal transect (Table 1). Spring alligator (0.5m and larger) densities in WCA3A-HD ranged from 1.8-2.2/km in the marsh and 5.3-6.9/km in the canal (Table 1). For fall surveys in WCA3A-HD, the number of alligators observed with a total length ≥ 0.5m ranged from 9-21 in marsh transects and 21-33 for the canal transect (Table 2). Fall alligator (0.5m and larger) densities in WCA3A-HD ranged from 0.9-2.1/km in the marsh and 2.1-3.3/km in the canal (Table 2). During spring surveys in WCA3A-N41, the number of alligators observed with a total length ≥ 0.5m ranged from 9-22 in marsh transects and 22-28 for the canal transect (Table 1). Spring alligator (0.5m and larger) densities in WCA3A-N41 ranged from 0.9-2.2/km in the marsh and 2.2-2.8/km in the canal (Table 1). For fall surveys in WCA3A-N41, the number of alligators observed with a total length ≥ 0.5m ranged from 10-24 in marsh transects and 6-12 for the canal transect (Table 2). Fall alligator (0.5m and larger) densities in WCA3A-N41 ranged from 1.0-2.4/km in the marsh and 0.6-1.2/km in the canal (Table 2).

2003 surveys of ENP included four marsh transects (ENP-FC and ENP-SS), two estuarine transects (ENP-EST), and one canal transect (ENP-L67), all surveyed twice in both spring and fall. During spring surveys in ENP-FC, the number of alligators observed with a total length ≥ 0.5m ranged from 6-12 with a corresponding density range of 0.6-1.2/km (Table 1). For fall surveys in ENP-FC, the number of alligators observed ranged from 5-16 with a corresponding density range of 0.5-1.6/km (Table 2). During spring surveys in ENP-SS, the number of alligators observed with a total length ≥ 0.5m ranged from 7-17 with a corresponding density range of 0.7-1.7/km (Table 1). For fall surveys in ENP-SS, the number of alligators observed ranged from 8-19 with a corresponding density range of 0.7-1.8/km (Table 2). During spring surveys in ENP-EST, the number of alligators observed with a total length ≥ 0.5m ranged from 0-36 with a corresponding density range of 0.0-3.6/km (Table 1). For fall surveys in ENP-EST, the number of alligators observed ranged from 1-9 with a corresponding density range of 0.1-0.9/km (Table 2). During spring surveys in ENP-L67, the number of alligators observed with a total length ≥ 0.5m ranged from 91-122 with a corresponding density range of 9.94-12.34/km (Table 1). For fall surveys in ENP-L67, the number of alligators observed ranged from 15-22 with a corresponding density range of 1.71-2.51/km (Table 2).

Ninety-six alligators were captured during spring 2003 and 127 in the fall 2003 (Figure 2, Table 3). Captured animals were measured and weighed, marked with web tags or scute clipped, and immediately released at the capture location. Seven (3.1%) of the 223 captured alligators were recaptures. One hundred-eleven (49.8%) of the captured alligators were female and one hundred-eleven (49.8%) were male. Gender of one animal was not determined (Table 3). Condition factor of captured alligators was calculated using Fulton’s K as described by (Zweig 2003) for each of the survey areas (Figure 3). Mean condition factor for spring 2003 alligators in all areas except WCA3A-

41 were in the 2nd quartile, with WCA3A-41 fitting into the 3rd quartile (Table 4). For Fall 2003, ENP-SS and WCA3A-41 were in the 3rd quartile, while all other areas were in the 2nd quartile (Figure 4).

Discussion

Alligator spotlight surveys will continue in 2004 including the newly added canal survey route in LOX. New routes will be considered including routes in WCA3B and Big Cypress National Preserve. Permanent routes have been established in ENP, LOX, WCA2A and WCA3A, and surveys will be conducted at the end of wet and dry seasons of 2004 in these areas. Data collected over the period of three to fives years is required to detect a change at the scale of interest and at that time trend analysis of data will begin.

Staff gauge readings from survey routes in WCA2A and WCA3A have been collected over the past year and compared to regional hydrological data to determine if a strong correlation exists. When using the coefficient of determination R^2, it was found that each staff gauge placed in the conservation areas has at least one SFWMD gauge where 77 to 97% of the variation in water level can be described (Table 5). These relationships allow the monthly monitoring of gauges in the field to be discontinued and the use of linear regression to predict future water levels along survey routes. Survey protocol will be further tested, assessed, and modified as necessary to best meet the stated needs of Everglades restoration goals.

The mean condition factor calculated for captured alligators during the 2003 season were lower then in previous years (Figure 3). Capture data is incomplete for several areas; ENP-FC was first added to the catch effort in fall 2003 and ENP-SS and WCA3A-TW have been to dry to perform capture efforts during several dry seasons. Condition of all alligators captured during 2003 fell into either the 2nd or 3rd quartiles (Table 4). However, one must be careful when separating condition into high and low that instant judgments are not attached to those categories. When using a condition index, results must be taken in the context of nearby populations. Fatter alligators are not necessarily living in a better environment. Like with humans, there are upper and lower limits to fat stores as they relate to condition. It is not minor fluctuations that we are interested in, but the extremes that could give clues to population and ecosystem health (Zweig 2003).

Condition is a very fluid measurement. Water management practices and rainfall can dramatically change condition of animals in a relatively short amount of time, because so many aspects of their life history (feeding, courtship, and nesting) depend on seasonally fluctuating water levels. Which is why we can use this data to look at seasonal effects. Alligators in the Everglades are adapted for a dry down, at which time prey get concentrated in the remaining bodies of water making it easier for the alligators to find food and feed. When water is high for a prolonged period prey is dispersed and condition declines because prey is harder to find. While hydrologic conditions are important to the American alligator, they are not the only factor that affects condition. Disease, climatic change, nutrient input, and contaminants all contribute to condition and should be considered when using a condition index to analyze population health. While condition is a useful way to evaluate current Everglades restoration, it should not be taken out of context of events in the greater ecosystem. To continue monitoring condition and determine demographic (size class and sex) structure of alligator populations, semi-annual capture surveys will continue to be performed in each of the Water Conservation Areas, Everglades National Park, and A.R.M. Loxahatchee National Wildlife Refuge. By the end of 2004 we will have enough data to be able to perform power analyses trends on condition and spotlight count data.

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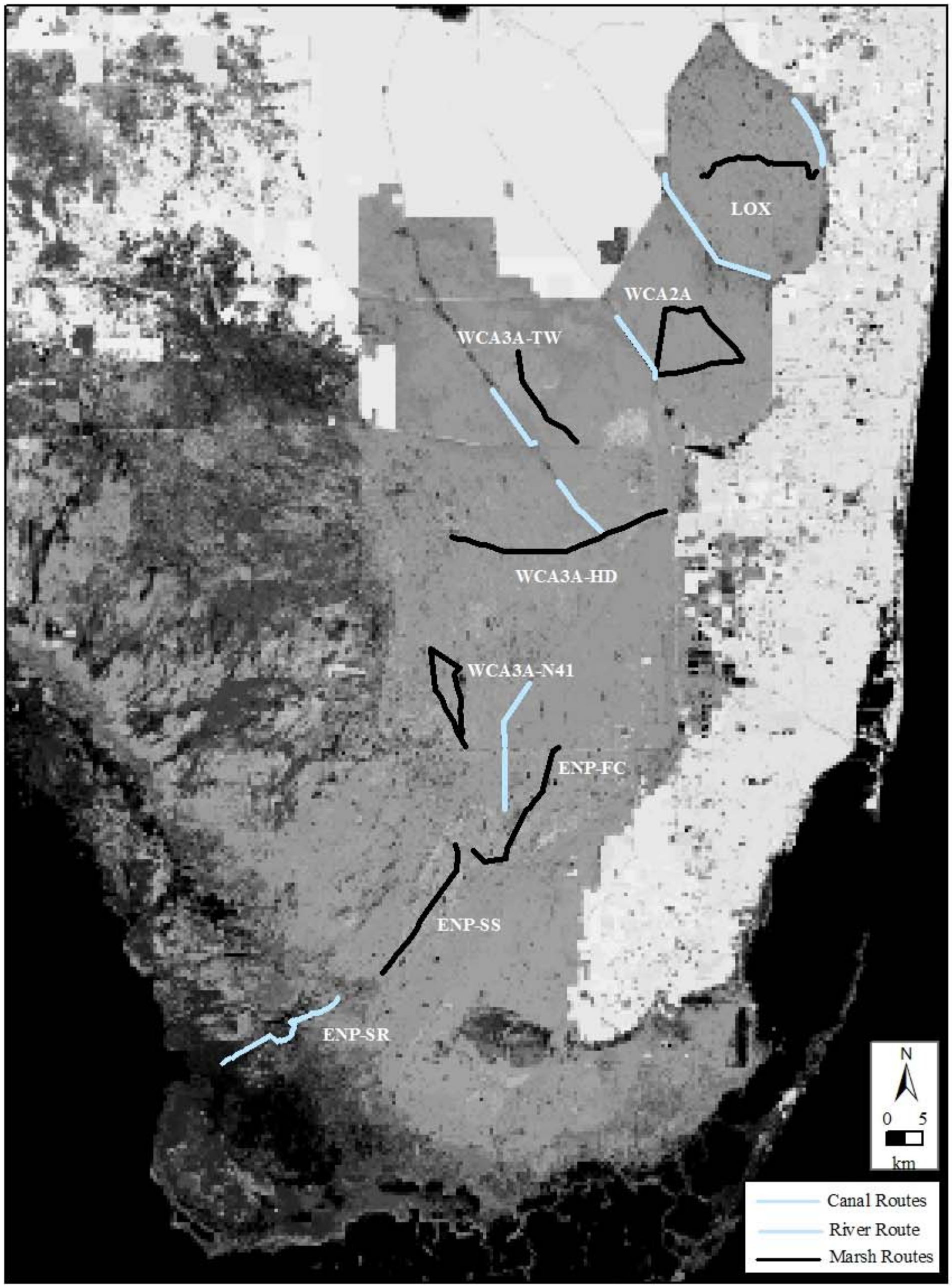

Figure 1. Alligator spotlight survey routes for South Florida.

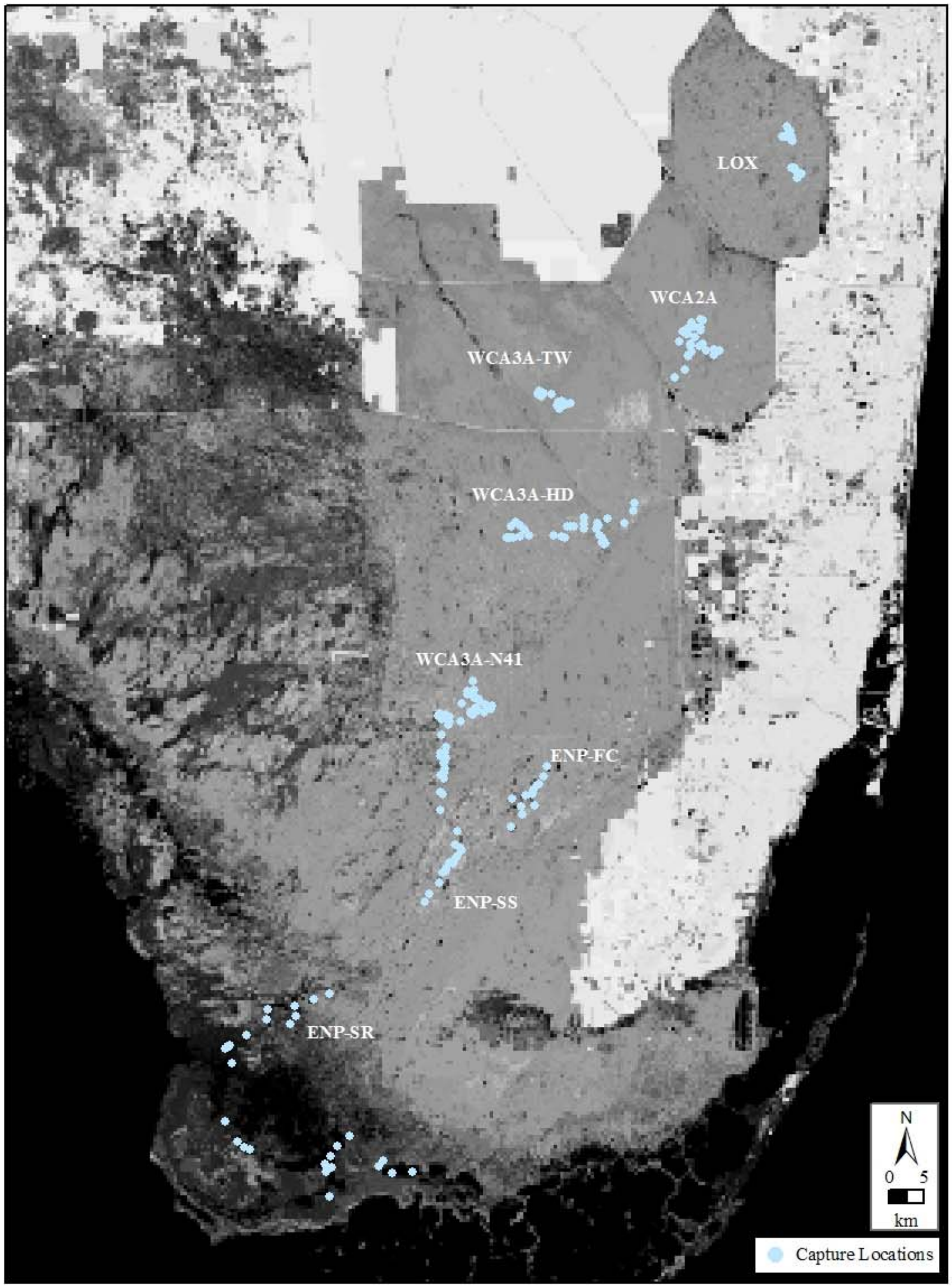

Figure 2. South Florida alligator capture locations for the 2003.

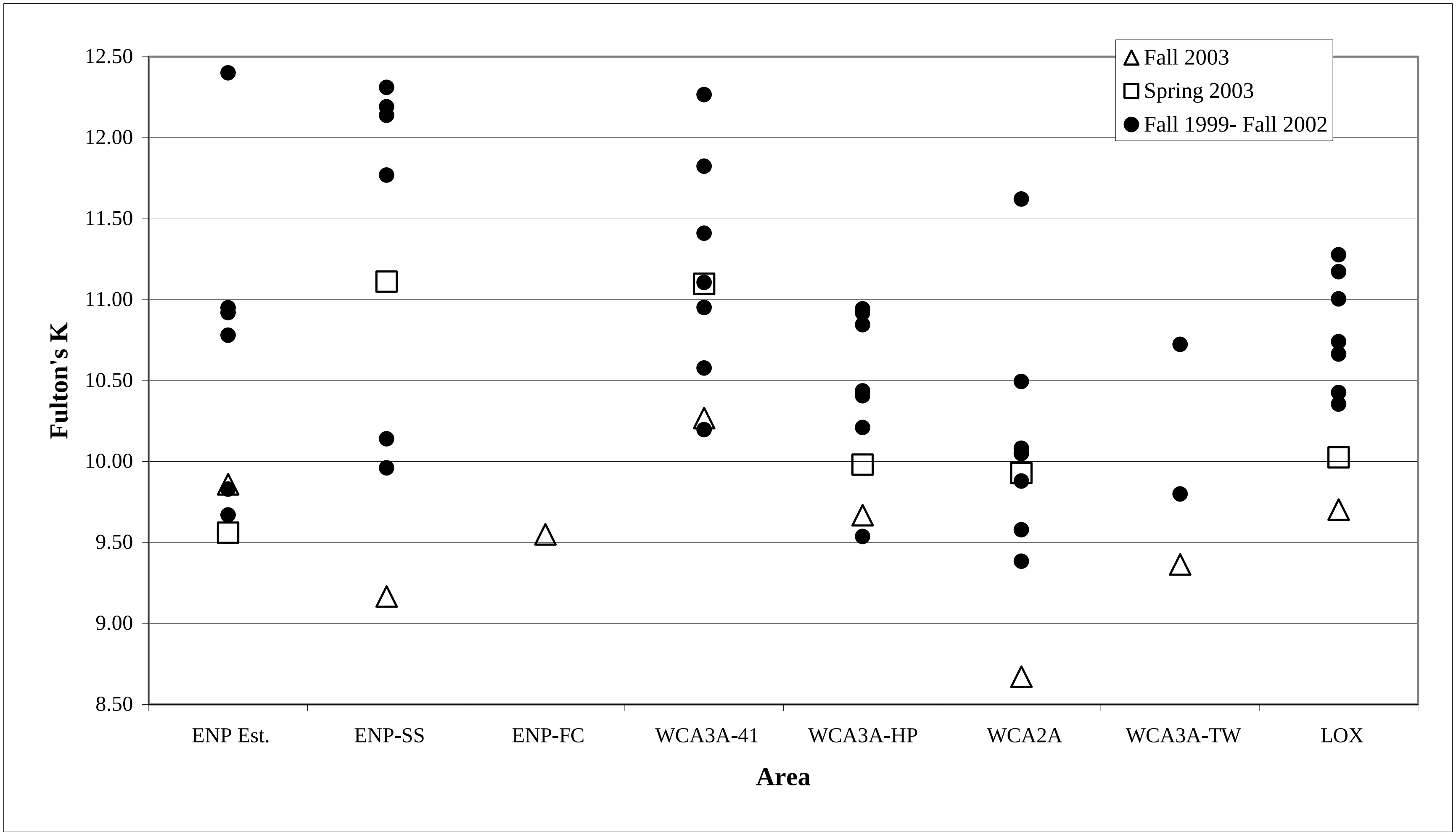

Figure 3: Range of Fulton’s K index values (mean) by capture area in south Florida. Values are for captures made from October 1999 to October 2003 (n = 723).

Table 1. Alligator survey summaries for Spring 2003.

Date	Area	Habitat	Transect #	Transect Length (km)	# ≥ 0.5m per km	Undetermined	Hatchling	Small	Small ≥ 0.5m	Medium	Large	# ≥ 0.5m	Total (Non Hatchling)
3/11/2003	WCA2A	Canal	1	10	7.30	0	0	1	0	7	66	73	74
3/11/2003	WCA2A	Marsh	1	10	0.90	0	0	2	0	6	3	9	11
3/11/2003	WCA2A	Marsh	2	10	0.90	1	0	0	0	7	2	9	10
4/6/2003	WCA2A	Canal	1	10	0.40	0	0	0	0	0	4	4	4
4/6/2003	WCA2A	Marsh	1	10	2.00	1	0	2	2	4	14	20	21
4/6/2003	WCA2A	Marsh	2	10	1.40	1	0	2	2	8	4	14	15
3/11/2003	WCA3A-TW	Canal	1	10	16.20	47	0	16	9	60	93	162	216
3/11/2003	WCA3A-TW	Marsh	1	6.75	0.15	0	0	2	0	0	1	1	3
3/11/2003	WCA3A-TW	Marsh	2	7	2.71	0	0	16	16	1	2	19	19
4/11/2003	WCA3A-TW	Canal	1	10	13.70	13	0	4	1	40	96	137	153
3/26/2003	WCA3A-TW	Marsh	1	6.75	0.30	0	0	0	0	0	2	2	2
3/26/2003	WCA3A-TW	Marsh	2	7	1.00	0	0	2	2	3	2	7	7
3/12/2003	WCA3A-HD	Canal	1	10	6.90	0	0	7	3	7	59	69	73
3/12/2003	WCA3A-HD	Marsh	1	10	2.20	0	0	0	0	6	16	22	22
3/12/2003	WCA3A-HD	Marsh	2	10	1.70	1	0	2	1	7	9	17	19
4/2/2003	WCA3A-HD	Canal	1	10	5.30	0	0	2	2	1	50	53	53
4/2/2003	WCA3A-HD	Marsh	1	10	1.80	1	0	1	0	5	13	18	20
4/2/2003	WCA3A-HD	Marsh	2	10	1.80	0	0	4	3	6	9	18	19
3/13/2003	WCA3A-N41	Canal	1	10	2.20	9	0	2	1	2	19	22	32
3/13/2003	WCA3A-N41	Marsh	1	10	2.20	2	0	7	7	2	13	22	24
3/13/2003	WCA3A-N41	Marsh	2	10	0.90	1	0	2	2	4	3	9	10

Table 1. Continued

Date	Area	Habitat	Transect #	Transect Length (km)	# ≥ 0.5m per km	Undetermined	Hatchling	Small	Small ≥ 0.5m	Medium	Large	# ≥ 0.5m	Total (Non Hatchling)
4/10/2003	WCA3A-N41	Canal	1	10	2.80	1	0	0	0	9	19	28	28
4/10/2003	WCA3A-N41	Marsh	1	10	1.30	0	0	4	3	2	8	13	14
4/10/2003	WCA3A-N41	Marsh	2	10	1.40	0	0	2	1	7	6	14	15
3/10/2003	ENP-FC	Marsh	1	10	0.60	1	0	10	2	2	2	6	15
3/10/2003	ENP-FC	Marsh	2	10	0.90	1	0	5	2	2	5	9	13
3/24/2003	ENP-FC	Marsh	1	10	1.20	0	0	21	3	0	9	12	30
3/24/2003	ENP-FC	Marsh	2	10	0.60	0	0	3	2	0	4	6	7
3/10/2003	ENP-L67	Canal	1	8.75	12.34	13	0	1	0	43	65	108	122
3/10/2003	ENP-SS	Marsh	1	10	0.80	1	0	14	3	1	4	8	20
3/10/2003	ENP-SS	Marsh	2	10	1.70	1	0	6	4	5	8	17	20
3/24/2003	ENP-L67	Canal	1	8.75	9.94	3	0	2	1	32	54	87	91
3/24/2003	ENP-SS	Marsh	1	10	0.70	0	0	7	1	4	2	7	13
3/24/2003	ENP-SS	Marsh	2	10	0.90	0	0	3	3	3	3	9	9
2/25/2003	ENP-EST	River	1	10	3.60	6	0	1	0	11	25	36	43
2/25/2003	ENP-EST	River	2	10	0.30	0	0	0	0	2	1	3	3
3/19/2003	ENP-EST	River	1	10	1.40	1	0	1	0	2	12	14	16
3/19/2003	ENP-EST	River	2	10	0.00	0	0	0	0	0	0	0	0
3/19/2003	LOX-L39	Canal	1	10	4.40	4	0	1	1	21	22	44	48
3/19/2003	LOX-L39	Canal	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4/11/2003	LOX-L39	Canal	1	10	4.50	3	0	2	2	7	36	45	48
4/11/2003	LOX-L39	Canal	2	8.7	7.24	5	0	1	0	0	63	63	69
3/24/2003	LOX-M	Marsh	1	10	5.40	6	0	40	13	17	24	54	87
3/24/2003	LOX-M	Marsh	2	10	4.60	2	0	25	15	9	22	46	58

Table 1. Continued

Date	Area	Habitat	Transect #	Transect Length (km)	# ≥ 0.5m per km	Undetermined	Hatchling	Small	Small ≥ 0.5m	Medium	Large	# ≥ 0.5m	Total (Non Hatchling)
4/12/2003	LOX-M	Marsh	1	10	6.30	4	0	33	12	15	36	63	88
4/12/2003	LOX-M	Marsh	2	10	7.80	2	0	32	22	14	42	78	90
3/17/2003	LOX-L40	Canal	1	10	17.00	10	0	38	5	63	102	170	213
4/7/2003	LOX-L40	Canal	1	10	13.00	4	0	35	18	12	100	130	151

Abbreviations

LOXL40	Arthur R. Marshall Loxahatchee National Wildlife Refuge Levee 40
LOXL39	Arthur R. Marshall Loxahatchee National Wildlife Refuge Levee 39
LOXM	Arthur R. Marshall Loxahatchee National Wildlife Refuge Marsh
WCA2A	Water Conservation Area 2A
WCA3A-TW	Water Conservation Area 3A Tower Camp
WCA3A-HD	Water Conservation Area 3A Holiday Park
WCA3A-N41	Water Conservation Area 3A North of Hwy. 41
ENP-L67	Everglades National Park Levy 67
ENP-SS	Everglades National Park-Shark Slough
ENP-FC	Everglades National Park-Frog City
ENP-EST	Everglades National Park-Shark River Estuaries
ND	No Data

Table 2. Alligator survey summaries for Fall 2003.

Date	Area	Habitat	Transect #	Transect Length (km)	# ≥ 0.5m per km	Undetermined	Hatchling	Small	Small ≥ 0.5m	Medium	Large	# ≥ 0.5m	Total (Non Hatchling)
9/16/2003	WCA2A	Canal	1	10	1.00	0	0	0	0	0	10	10	10
9/16/2003	WCA2A	Marsh	1	10	1.20	0	0	1	1	4	7	12	12
9/16/2003	WCA2A	Marsh	2	10	1.10	0	8	10	1	5	5	11	12
10/1/2003	WCA2A	Canal	1	10	0.70	0	41	42	1	2	4	7	7
10/1/2003	WCA2A	Marsh	1	10	0.80	0	0	4	4	2	2	8	8
10/1/2003	WCA2A	Marsh	2	10	1.20	0	18	20	2	5	5	12	12
9/19/2003	WCA3A-TW	Canal	1	10	2.40	4	0	0	0	8	16	24	28
9/19/2003	WCA3A-TW	Marsh	1	6.75	0.30	0	0	0	0	0	2	2	2
9/19/2003	WCA3A-TW	Marsh	2	7	1.43	0	0	6	2	4	4	10	14
10/3/2003	WCA3A-TW	Canal	1	10	1.50	0	0	2	2	2	11	15	15
10/3/2003	WCA3A-TW	Marsh	1	6.75	0.30	0	0	0	0	2	0	2	2
10/3/2003	WCA3A-TW	Marsh	2	7	1.43	0	0	8	7	1	2	10	11
9/17/2003	WCA3A-HD	Canal	1	10	2.10	0	35	39	4	8	9	21	21
9/17/2003	WCA3A-HD	Marsh	1	10	2.10	0	7	12	4	5	12	21	22
9/17/2003	WCA3A-HD	Marsh	2	10	0.90	0	0	1	1	1	7	9	9
10/2/2003	WCA3A-HD	Canal	1	10	3.30	0	14	15	1	13	19	33	33
10/2/2003	WCA3A-HD	Marsh	1	10	1.30	0	0	1	1	2	10	13	13
10/2/2003	WCA3A-HD	Marsh	2	10	1.00	0	0	2	0	3	7	10	12
9/17/2003	WCA3A-N41	Canal	1	10	1.20	1	0	1	1	5	6	12	13
9/17/2003	WCA3A-N41	Marsh	1	10	1.10	1	0	3	3	4	4	11	12
9/17/2003	WCA3A-N41	Marsh	2	10	1.30	2	0	8	6	2	5	13	15
10/1/2003	WCA3A-N41	Canal	1	10	0.60	0	0	1	1	1	4	6	6
10/1/2003	WCA3A-N41	Marsh	1	10	1.00	0	0	5	2	5	3	10	13
10/1/2003	WCA3A-N41	Marsh	2	10	2.40	1	0	10	6	18	0	24	29
9/16/2003	ENP-FC	Marsh	1	10	0.50	1	1	2	1	2	2	5	6
9/16/2003	ENP-FC	Marsh	2	10	0.70	0	2	7	0	4	3	7	12

Table 2. Continued.

Date	Area	Habitat	Transect #	Transect Length (km)	# ≥ 0.5m per km	Undetermined	Hatchling	Small	Small ≥ 0.5m	Medium	Large	# ≥ 0.5m	Total (Non Hatchling)
9/29/2003	ENP-FC	Marsh	1	10	1.60	0	7	10	3	8	5	16	16
9/29/2003	ENP-FC	Marsh	2	10	1.20	0	0	2	0	8	3	12	14
9/16/2003	ENP-L67	Canal	1	8.75	1.71	1	0	1	0	3	12	15	17
9/16/2003	ENP-SS	Marsh	1	10	0.70	0	4	5	0	4	3	7	8
9/16/2003	ENP-SS	Marsh	2	10	1.60	0	19	20	1	9	6	16	16
9/29/2003	ENP-L67	Canal	1	8.75	2.51	0	0	3	1	9	12	22	24
9/29/2003	ENP-SS	Marsh	1	10	1.60	0	4	11	4	9	3	16	19
9/29/2003	ENP-SS	Marsh	2	10	1.80	0	4	6	2	10	6	18	18
9/17/2003	ENP-EST	River	1	10	0.30	0	0	0	0	0	3	3	3
9/17/2003	ENP-EST	River	2	10	0.40	1	0	0	0	1	3	4	5
10/12/2003	ENP-EST	River	1	10	0.10	0	0	0	0	0	1	1	1
10/12/2003	ENP-EST	River	2	10	0.90	0	0	0	0	2	7	9	9
9/17/2003	LOX-L39	Canal	1	10	2.70	1	0	1	1	1	25	27	28
9/17/2003	LOX-L39	Canal	2	10	20.90	2	0	1	1	2	206	209	211
10/1/2003	LOX-L39	Canal	1	10	1.60	1	0	0	0	4	12	16	17
10/1/2003	LOX-L39	Canal	2	10	0.70	0	0	0	0	0	7	7	7
9/15/2003	LOX-L40	Canal	1	10	6.80	2	0	3	3	3	62	68	70
9/30/2003	LOX-L40	Canal	1	10	3.80	1	13	28	8	5	25	38	46
9/18/2003	LOX-M	Marsh	1	10	5.70	8	75	114	26	10	22	57	79
9/18/2003	LOX-M	Marsh	2	10	5.40	0	46	73	17	11	3	54	64
10/2/2003	LOX-M	Marsh	1	10	4.40	6	31	62	17	13	14	44	64
10/2/2003	LOX-M	Marsh	2	10	4.40	2	44	57	9	11	24	44	50

Table 2. Continued.

Abbreviations

LOXL40	Arthur R. Marshall Loxahatchee National Wildlife Refuge Levee 40
LOXL39	Arthur R. Marshall Loxahatchee National Wildlife Refuge Levee 39
LOXM	Arthur R. Marshall Loxahatchee National Wildlife Refuge Marsh
WCA2A	Water Conservation Area 2A
WCA3A-TW	Water Conservation Area 3A Tower Camp
WCA3A-HD	Water Conservation Area 3A Holiday Park
WCA3A-N41	Water Conservation Area 3A North of Hwy. 41
ENP-L67	Everglades National Park Levy 67
ENP-SS	Everglades National Park-Shark Slough
ENP-FC	Everglades National Park-Frog City
ENP-EST	Everglades National Park-Shark River Estuaries

Table 3. Summary of Alligator Captures for 2003.

Capture Date	Area	**Tag #	Recapture	HL (cm)	SVL (cm)	TL (cm)	TG (cm)	Weight (kg)	Sex
4/1/2003	LOX	180	NO	15.5	57.0	113.0	20.0	3.10	F
4/1/2003	LOX	184	NO	28.0	106.8	197.0	42.5	24.75	F
4/1/2003	LOX	185	NO	32.5	124.0	241.5	50.3	42.00	F
4/1/2003	LOX	186	NO	19.0	68.0	135.0	28.5	7.30	F
4/1/2003	LOX	181	NO	33.0	120.0	232.0	49.0	37.50	M
4/1/2003	LOX	182	NO	27.3	101.5	195.5	36.5	20.00	M
4/1/2003	LOX	183	NO	23.6	87.7	172.0	32.0	13.00	M
4/1/2003	LOX	190	NO	33.5	123.5	229.0	39.3	32.50	M
4/1/2003	LOX	187	NO	33.5	126.0	248.0	51.8	40.00	M
4/2/2003	LOX	189	NO	14.5	50.0	103.0	18.4	2.50	F
4/2/2003	LOX	192	NO	31.0	121.0	229.0	42.0	32.00	F
4/2/2003	LOX	193	NO	19.2	69.0	140.0	26.5	6.80	F
4/2/2003	LOX	194	NO	18.5	70.0	14.0	26.0	6.80	F
4/2/2003	LOX	188	NO	14.3	50.5	103.5	18.7	2.55	M
4/2/2003	LOX	195	NO	18.0	57.5	132.0	25.3	6.10	M
4/7/2003	WCA2A	30624	NO	12.0	40.8	65.2	16.7	1.50	F
4/7/2003	WCA2A	30625	NO	9.2	34.0	69.5	11.0	0.70	F
4/7/2003	WCA2A	30651	NO	11.0	39.6	77.0	15.0	1.00	F
4/7/2003	WCA2A	30652	NO	28.0	100.0	201.0	41.3	24.00	F
4/7/2003	WCA2A	30653	NO	19.2	71.3	141.1	27.0	6.50	F
4/7/2003	WCA2A	30654	NO	10.5	37.3	75.9	13.2	0.84	F
4/7/2003	WCA2A	30656	NO	22.6	80.5	165.0	30.8	12.00	F
4/7/2003	WCA2A	30657	NO	25.5	97.5	198.2	39.0	22.00	F
4/7/2003	WCA2A	30675	NO	26.0	101.0	199.0	37.7	21.00	F
4/7/2003	WCA2A	36152	NO	28.5	104.5	207.5	38.0	25.50	F
4/7/2003	WCA2A	30601	NO	35.5	126.5	248.0	46.0	44.00	M
4/7/2003	WCA2A	30619	NO	21.0	78.0	159.0	29.6	9.40	M
4/7/2003	WCA2A	30621	NO	17.7	64.0	127.1	24.5	5.60	M
4/7/2003	WCA2A	30622	NO	16.0	60.5	121.5	23.4	4.40	M
4/7/2003	WCA2A	30623	NO	11.2	42.0	86.3	14.5	1.30	M
4/7/2003	WCA2A	30655	NO	13.8	51.0	101.7	17.0	2.00	M
4/7/2003	WCA2A	36020	NO	29.0	107.0	210.0	39.5	27.00	M
4/7/2003	WCA2A	38186	YES	23.5	89.9	180.3	31.8	14.00	M

Table 3. Continued.

Capture Date	Area	**Tag #	Recapture	HL (cm)	SVL (cm)	TL (cm)	TG (cm)	Weight (kg)	Sex
4/7/2003	WCA3A-HD	30626	NO	12.5	44.2	87.1	15.4	1.48	F
4/7/2003	WCA3A-HD	30627	NO	11.4	41.3	82.2	14.2	1.12	F
4/7/2003	WCA3A-HD	30628	NO	16.5	63.6	122.2	22.7	4.00	F
4/7/2003	WCA3A-HD	30629	NO	24.0	86.2	172.8	38.4	19.20	F
4/7/2003	WCA3A-HD	30631	NO	30.4	111.5	216.0	45.4	30.00	F
4/7/2003	WCA3A-HD	30630	NO	24.0	90.9	173.4	36.5	16.80	M
4/7/2003	WCA3A-HD	30632	NO	25.9	93.2	186.0	38.8	19.50	M
4/7/2003	WCA3-HD	30725	NO	26.0	96.2	190.5	36.2	20.00	F
4/7/2003	WCA3-HD	30774	NO	17.1	63.7	127.5	24.0	5.00	F
4/7/2003	WCA3-HD	30775	NO	25.0	94.3	192.2	38.0	18.50	F
4/7/2003	WCA3-HD	30776	NO	18.9	67.7	134.5	23.9	5.50	F
4/7/2003	WCA3-HD	30778	NO	9.9	35.0	71.0	14.5	0.82	F
4/7/2003	WCA3-HD	38112	YES	22.3	85.2	169.5	34.0	13.50	F
4/7/2003	WCA3-HD	30701	NO	9.9	35.1	70.5	12.4	0.75	M
4/7/2003	WCA3-HD	30702	NO	25.0	85.9	171.6	36.7	15.00	M
4/7/2003	WCA3-HD	30751	NO	21.7	81.7	161.8	30.5	10.50	M
4/7/2003	WCA3-HD	30777	NO	20.8	75.8	149.2	29.0	9.06	M
4/7/2003	WCA3-HD	30800	NO	19.3	69.0	135.1	25.0	5.76	M
4/8/2003	ENP-SS	30635	NO	15.0	54.3	107.6	19.9	3.20	F
4/8/2003	ENP-SS	30648	NO	27.9	106.8	171.0	44.5	ND	F
4/8/2003	ENP-SS	30650	NO	32.1	121.3	235.0	48.0	ND	F
4/8/2003	ENP-SS	30721	NO	21.8	79.4	158.2	31.6	10.50	F
4/8/2003	ENP-SS	30722	NO	26.6	97.8	195.0	43.0	25.00	F
4/8/2003	ENP-SS	30723	NO	14.5	54.3	114.0	21.2	3.83	F
4/8/2003	ENP-SS	30724	NO	30.5	111.0	214.0	50.0	37.50	F
4/8/2003	ENP-SS	30633	NO	38.7	140.6	273.0	63.4	ND	M
4/8/2003	ENP-SS	30634	NO	22.7	83.9	170.0	31.9	12.50	M
4/8/2003	WCA3A-N41	30611	NO	18.5	69.0	138.8	26.5	6.80	F
4/8/2003	WCA3A-N41	30612	NO	17.4	63.0	127.6	22.9	4.90	F
4/8/2003	WCA3A-N41	30613	NO	23.5	87.7	178.4	35.3	15.00	F
4/8/2003	WCA3A-N41	30615	NO	12.4	44.3	91.1	16.9	1.80	F
4/8/2003	WCA3A-N41	30616	NO	25.8	99.0	198.2	40.0	22.50	F
4/8/2003	WCA3A-N41	30617	NO	26.9	97.3	193.2	40.6	23.50	F
4/8/2003	WCA3A-N41	30662	NO	13.3	49.5	97.7	17.8	2.20	F
4/8/2003	WCA3A-N41	30664	NO	29.6	111.5	209.8	43.0	30.00	F
4/8/2003	WCA3A-N41	30666	NO	15.2	55.6	110.6	19.0	3.10	F
4/8/2003	WCA3A-N41	30614	NO	23.5	89.6	178.5	35.8	16.00	M
4/8/2003	WCA3A-N41	30618	NO	25.8	97.8	191.0	35.4	17.00	M

Table 3. Continued.

Capture Date	Area	**Tag #	Recapture	HL (cm)	SVL (cm)	TL (cm)	TG (cm)	Weight (kg)	Sex
4/8/2003	WCA3A-N41	30659	NO	17.2	72.7	145.5	29.3	9.10	M
4/8/2003	WCA3A-N41	30660	NO	31.4	117.5	222.7	46.5	32.00	M
4/8/2003	WCA3A-N41	30663	NO	24.0	92.5	177.0	34.3	14.30	M
4/8/2003	WCA3A-N41	30665	NO	16.3	62.2	121.6	23.0	4.20	M
4/9/2003	ENP-SS	30647	NO	12.8	45.7	91.8	17.5	1.90	F
4/9/2003	ENP-SS	30780	NO	28.4	102.2	203.8	36.1	23.00	F
4/9/2003	ENP-SS	30781	NO	21.0	84.5	166.0	31.4	11.50	F
4/9/2003	ENP-SS	30783	NO	28.5	100.7	200.0	38.0	24.00	F
4/9/2003	ENP-SS	30782	NO	33.7	125.5	197.0	50.0	43.00	M
4/9/2003	ENP-SS	30784	NO	35.5	133.3	256.0	55.5	58.00	M
5/6/2003	ENP-EST	38155	NO	21.0	77.0	156.4	32.8	9.50	M
5/6/2003	ENP-EST	38139	NO	13.0	47.0	95.1	19.0	2.30	M
5/7/2003	ENP-EST	38136	NO	35.4	124.7	250.3	50.4	46.00	M
5/7/2003	ENP-EST	38153	NO	20.7	75.0	151.8	31.4	8.80	M
5/7/2003	ENP-EST	38154	NO	31.2	113.4	222.9	44.5	28.50	M
5/7/2003	ENP-EST	38156	NO	37.3	128.9	253.5	53.6	ND	M
5/7/2003	ENP-EST	38157	NO	22.3	80.2	160.4	34.0	6.60	M
5/8/2003	ENP-EST	38069	NO	17.9	67.0	140.0	28.3	6.70	F
5/8/2003	ENP-EST	39080	NO	13.9	48.2	97.3	18.1	2.40	F
5/8/2003	ENP-EST	38135	NO	22.5	81.5	163.9	31.9	10.25	M
5/8/2003	ENP-EST	38138	NO	24.0	85.5	171.6	33.6	12.00	M
5/8/2003	ENP-EST	38147	NO	18.4	66.0	130.4	24.8	5.90	M
5/8/2003	ENP-EST	38151	NO	30.0	112.2	219.5	41.8	27.00	M
5/8/2003	ENP-EST	38159	NO	25.7	94.5	185.6	37.3	16.40	M
5/8/2003	ENP-EST	39087	NO	29.3	106.3	212.0	40.3	24.00	M
10/5/2003	LOX	196	NO	13.0	48.0	93.5	16.5	2.00	F
10/5/2003	LOX	197	NO	18.5	66.0	133.0	25.5	5.90	F
10/5/2003	LOX	198	NO	30.0	109.0	214.5	39.0	24.00	F
10/5/2003	LOX	199	NO	14.0	51.5	104.0	18.5	2.55	F
10/5/2003	LOX	212	NO	17.0	62.5	122.5	22.5	4.80	F
10/5/2003	LOX	213	NO	34.0	127.0	245.0	49.5	46.00	M
10/5/2003	LOX	214	NO	34.0	127.0	233.0	47.0	41.00	F
10/6/2003	LOX	221	NO	20.0	72.5	148.5	27.5	7.90	M
10/6/2003	LOX	219	NO	20.3	72.0	145.0	28.5	8.50	M
10/6/2003	LOX	222	NO	16.6	57.0	117.0	21.0	3.70	F
10/6/2003	LOX	215	NO	27.0	102.5	206.0	38.5	22.00	F
10/6/2003	LOX	216	NO	24.0	87.0	175.0	31.5	13.00	F

Table 3. Continued.

Capture Date	Area	**Tag #	Recapture	HL (cm)	SVL (cm)	TL (cm)	TG (cm)	Weight (kg)	Sex
10/6/2003	LOX	217	NO	26.8	97.0	190.0	35.5	18.50	F
10/6/2003	LOX	218	NO	32.0	112.5	213.5	46.5	27.00	M
10/6/2003	LOX	220	NO	28.2	103.5	206.0	39.5	23.50	F
10/6/2003	WCA2A	38076	YES	19.0	68.2	135.7	24.9	5.70	M
10/6/2003	WCA2A	39801	NO	20.6	76.2	150.0	26.6	7.00	M
10/6/2003	WCA2A	39802	NO	15.8	55.4	111.3	19.7	3.00	F
10/6/2003	WCA2A	39803	NO	11.1	39.2	77.2	11.3	1.10	M
10/6/2003	WCA2A	39804	NO	14.0	51.1	102.4	17.8	2.30	F
10/6/2003	WCA2A	39805	NO	12.2	42.0	82.3	14.3	1.20	M
10/6/2003	WCA2A	39851	NO	10.5	38.5	80.0	14.5	1.08	M
10/6/2003	WCA2A	51127	NO	29.5	111.5	217.4	37.6	25.00	F
10/6/2003	WCA2A	51176	NO	25.6	95.5	182.5	33.5	15.50	M
10/6/2003	WCA2A	51177	NO	29.7	106.5	208.0	37.4	21.00	F
10/6/2003	WCA2A	51178	NO	28.0	102.8	199.5	38.6	21.50	F
10/6/2003	WCA2A	51179	NO	33.0	117.5	229.0	43.6	32.50	M
10/6/2003	WCA2A	51180	NO	21.7	81.4	162.6	31.0	11.00	F
10/6/2003	WCA2A	51181	NO	21.9	78.5	153.0	25.5	8.20	M
10/6/2003	WCA2A	51182	NO	17.7	63.4	128.4	23.9	5.20	F
10/6/2003	WCA3A-TW	38074	NO	15.0	55.9	107.7	19.9	3.15	M
10/6/2003	WCA3A-TW	38075	NO	15.9	56.6	115.8	21.0	3.60	F
10/6/2003	WCA3A-TW	38137	NO	24.3	89.8	176.2	34.1	15.46	ND
10/6/2003	WCA3A-TW	38174	NO	11.7	43.2	88.3	15.4	1.50	M
10/6/2003	WCA3A-TW	38175	NO	10.8	37.6	77.0	13.3	1.05	M
10/6/2003	WCA3A-TW	39826	NO	16.8	59.6	122.5	21.9	4.20	F
10/6/2003	WCA3A-TW	39827	NO	11.3	40.8	79.5	14.4	1.25	F
10/6/2003	WCA3A-TW	39828	NO	12.5	44.8	89.5	16.2	1.75	M
10/6/2003	WCA3A-TW	39829	NO	12.8	46.7	90.2	16.2	1.80	F
10/6/2003	WCA3A-TW	39830	NO	12.0	42.4	83.9	14.4	1.30	M
10/6/2003	WCA3A-TW	39831	NO	14.9	51.1	100.5	18.8	2.75	F
10/6/2003	WCA3A-TW	39832	NO	20.0	71.8	144.5	28.2	7.65	M
10/6/2003	WCA3A-TW	51106	NO	33.5	125.0	238.9	56.0	51.00	F
10/6/2003	WCA3A-TW	51107	NO	23.8	85.1	173.8	32.1	12.15	M
10/6/2003	WCA3A-TW	51148	NO	33.0	117.2	232.8	40.6	31.00	M
10/6/2003	WCA3A-TW	51149	NO	27.9	95.4	190.8	38.6	21.00	M
10/7/2003	WCA3A-TW	51104	NO	39.8	139.0	271.5	58.5	70.00	M
10/7/2003	WCA3A-HD	39805	NO	21.7	81.0	159.5	30.5	10.00	F
10/7/2003	WCA3A-HD	39806	NO	14.3	55.3	107.0	18.5	2.80	F

Table 3. Continued.

Capture Date	Area	**Tag #	Recapture	HL (cm)	SVL (cm)	TL (cm)	TG (cm)	Weight (kg)	Sex
10/7/2003	WCA3A-HD	39807	NO	17.3	64.7	126.2	21.5	4.30	M
10/7/2003	WCA3A-HD	39808	NO	15.3	55.5	111.0	16.5	2.80	M
10/7/2003	WCA3A-HD	39853	NO	11.2	40.7	80.0	14.6	1.20	M
10/7/2003	WCA3A-HD	39854	NO	13.3	46.5	95.0	16.8	2.10	F
10/7/2003	WCA3A-HD	39855	NO	17.6	63.2	127.2	23.9	4.75	F
10/7/2003	WCA3A-HD	39874	NO	11.4	39.9	80.1	14.2	1.30	M
10/7/2003	WCA3A-HD	39875	NO	14.7	53.0	106.9	19.5	3.10	M
10/7/2003	WCA3A-HD	51128	NO	28.5	105.0	200.0	41.5	22.00	F
10/7/2003	WCA3A-HD	51129	NO	29.9	119.0	224.5	45.5	34.00	F
10/7/2003	WCA3A-HD	51183	NO	30.3	111.0	215.6	42.4	27.00	M
10/7/2003	WCA3A-HD	51184	NO	30.4	111.6	219.0	44.8	34.00	F
10/7/2003	WCA3A-HD	51185	NO	26.5	93.8	183.2	35.7	17.40	F
10/7/2003	WCA3A-HD	51186	NO	29.2	106.8	209.7	44.7	28.50	F
10/7/2003	WCA3A-N41	30659	YES	21.0	78.4	157.7	31.6	10.00	M
10/7/2003	WCA3A-N41	39833	NO	22.0	78.0	158.6	31.1	10.40	M
10/7/2003	WCA3A-N41	39834	NO	24.0	90.0	178.5	34.3	14.25	M
10/7/2003	WCA3A-N41	39835	NO	10.3	35.4	72.3	12.0	0.81	M
10/7/2003	WCA3A-N41	39850	NO	14.2	50.6	96.9	18.3	2.60	F
10/7/2003	WCA3A-N41	39976	NO	14.6	49.0	99.6	17.5	2.33	F
10/7/2003	WCA3A-N41	39977	NO	24.9	93.5	185.0	37.8	18.50	F
10/7/2003	WCA3A-N41	39978	NO	10.2	38.0	75.5	14.0	0.98	F
10/7/2003	WCA3A-N41	39979	NO	20.0	72.5	145.0	28.5	8.40	F
10/7/2003	WCA3A-N41	39980	NO	15.2	54.6	110.8	20.6	3.40	F
10/7/2003	WCA3A-N41	51108	NO	28.7	107.3	209.7	43.5	25.25	F
10/7/2003	WCA3A-N41	51109	NO	27.5	103.0	208.1	43.7	26.50	F
10/7/2003	WCA3A-N41	51125	NO	25.5	ND	181.0	35.7	16.00	F
10/7/2003	WCA3A-N41	51167	NO	27.0	101.5	195.3	39.4	22.00	F
10/7/2003	WCA3A-N41	51168	NO	25.8	97.6	188.6	39.9	21.00	F
10/7/2003	WCA3A-N41	51170	NO	28.0	101.8	200.1	45.1	25.50	F
10/8/2003	ENP-FC	38160	NO	23.5	84.5	168.2	27.5	9.50	M
10/8/2003	ENP-FC	38161	NO	25.9	96.9	188.5	35.8	17.50	F
10/8/2003	ENP-FC	38162	NO	22.3	80.9	161.0	32.6	11.30	F
10/8/2003	ENP-FC	38163	NO	17.0	60.1	121.2	22.6	4.20	M
10/8/2003	ENP-FC	38164	NO	23.3	85.8	169.2	30.2	12.00	M
10/8/2003	ENP-FC	39858	NO	17.2	61.8	122.0	22.5	4.60	M
10/8/2003	ENP-FC	39860	NO	12.2	43.9	84.9	14.1	1.30	F
10/8/2003	ENP-FC	39861	NO	11.7	41.4	82.4	15.0	1.25	F

Table 3. Continued.

Capture Date	Area	**Tag #	Recapture	HL (cm)	SVL (cm)	TL (cm)	TG (cm)	Weight (kg)	Sex
10/8/2003	ENP-FC	39870	NO	23.9	86.5	170.5	34.8	14.25	M
10/8/2003	ENP-FC	51101	NO	32.5	118.6	229.8	43.9	34.00	M
10/8/2003	ENP-FC	51173	NO	28.5	111.0	221.9	39.5	27.00	F
10/8/2003	ENP-FC	51187	NO	28.1	104.3	200.8	40.6	25.00	M
10/8/2003	ENP-FC	51189	NO	35.6	131.2	257.0	51.5	49.00	M
10/8/2003	ENP-FC	51190	NO	29.9	111.4	217.0	39.0	24.50	M
10/8/2003	ENP-FC	51192	NO	32.2	118.0	236.0	46.0	34.50	M
10/8/2003	ENP-SS	51131	NO	23.5	89.4	181.3	34.7	10.50	F
10/8/2003	ENP-SS	51133	NO	26.5	97.8	198.6	32.0	16.00	M
10/8/2003	ENP-SS	36196	YES	23.2	87.0	171.3	29.9	12.10	F
10/8/2003	ENP-SS	39810	NO	12.9	45.5	91.1	17.8	1.80	M
10/8/2003	ENP-SS	39821	NO	14.5	52.8	107.6	19.6	2.80	F
10/8/2003	ENP-SS	39824	NO	12.3	44.8	85.0	15.9	1.60	F
10/8/2003	ENP-SS	39836	NO	11.9	41.9	84.7	14.5	1.40	M
10/8/2003	ENP-SS	39837	NO	25.9	97.5	188.3	23.1	13.10	F
10/8/2003	ENP-SS	39838	NO	17.8	65.4	127.3	22.3	5.30	M
10/8/2003	ENP-SS	39839	YES	18.9	69.8	139.8	24.9	6.80	F
10/8/2003	ENP-SS	39840	NO	10.8	38.3	78.7	12.7	1.00	M
10/8/2003	ENP-SS	51130	NO	23.2	87.0	177.0	33.0	14.00	F
10/8/2003	ENP-SS	51132	NO	25.0	91.7	184.2	34.7	16.00	F
10/8/2003	ENP-SS	51134	NO	26.0	96.4	187.7	36.9	18.00	F
10/8/2003	ENP-SS	51135	NO	25.2	94.5	188.0	35.5	16.00	F
10/13/2003	ENP-EST	38088	YES	29.9	109.0	215.9	39.5	26.50	M
10/13/2003	ENP-EST	39867	NO	21.5	81.5	167.0	31.9	11.40	M
10/13/2003	ENP-EST	39992	NO	22.8	81.8	160.2	23.5	9.50	M
10/13/2003	ENP-EST	51103	NO	25.5	93.5	187.2	34.3	15.50	M
10/13/2003	ENP-EST	51158	NO	31.9	116.3	225.2	27.2	20.00	M
10/13/2003	ENP-EST	51159	NO	35.2	125.3	244.0	48.5	46.00	M
10/13/2003	ENP-EST	51160	NO	31.6	114.5	222.5	43.8	34.00	M
10/13/2003	ENP-EST	51161	NO	26.2	110.4	171.5	35.4	23.50	M
10/13/2003	ENP-EST	51162	NO	25.0	90.6	180.4	36.1	18.00	M
10/13/2003	ENP-EST	51163	NO	28.3	105.0	207.9	42.6	28.50	M
10/13/2003	ENP-EST	51165	NO	31.4	116.0	230.0	41.9	34.50	M
10/13/2003	ENP-EST	51166	NO	35.5	133.7	259.0	41.5	35.00	M
10/13/2003	ENP-EST	51172	NO	32.8	118.2	233.6	42.7	32.00	M
10/13/2003	ENP-EST	51191	NO	28.1	104.0	211.0	37.4	21.50	M
10/13/2003	ENP-EST	51193	NO	25.2	91.2	179.8	33.7	15.50	M

Table 3. Continued.

Capture Date	Area	**Tag #	Recapture	HL (cm)	SVL (cm)	TL (cm)	TG (cm)	Weight (kg)	Sex
10/13/2003	ENP-EST	51194	No	22.6	85.5	147.0	30.3	10.50	M
10/13/2003	ENP-EST	51195	NO	24.8	93.5	186.5	33.5	14.50	M
10/13/2003	ENP-EST	51198	NO	38.5	137.5	277.7	38.4	39.00	M
10/13/2003	ENP-EST	51199	NO	28.2	103.0	206.8	42.5	25.00	M

Abbreviations

LOXL40	Arthur R. Marshall Loxahatchee National Wildlife Refuge Levee 40
LOXL39	Arthur R. Marshall Loxahatchee National Wildlife Refuge Levee 39
LOXM	Arthur R. Marshall Loxahatchee National Wildlife Refuge Marsh
WCA2A	Water Conservation Area 2A
WCA3A-TW	Water Conservation Area 3A Tower Camp
WCA3A-HD	Water Conservation Area 3A Holiday Park
WCA3A-N41	Water Conservation Area 3A North of Hwy. 41
ENP-L67	Everglades National Park Levy 67
ENP-SS	Everglades National Park-Shark Slough
ENP-FC	Everglades National Park-Frog City
ENP-EST	Everglades National Park-Shark River Estuaries
**	For LOX captures this corresponds to a scute clip number and for everywhere else it corresponds to a toe tag number.
ND	No Data

Table 4: Range of alligator condition for Fulton's K from Everglades data for October 1999 to October 2003 (n = 723). This shows division of condition by quartiles.

1st quartile: 2.57 – 6.4 – low condition
2nd quartile: 6.41 – 10.23 – low to average condition
3rd quartile: 10.24 – 14.06 – average to high condition
4th quartile: 14.07 – 17.89 – high condition

Table 5. R^2 for relationship between University of Florida (UF) staff gauges and water level gauge data provided by SFWMD.

	SFWMD Gauge		
UF Gauge	2A-2A17	2A-2A300	2A-WCA2U3
WCA2A 1	0.90*	0.82	0.83
WCA2A 2	0.90*	0.86	0.84
WCA2A 3	0.77*	0.73	0.72
WCA2A 4	0.87*	0.81	0.79

	SFWMD Gauge			
UF Gauge	Tow-Head S339	Tow-Tail S339	Tow-363	Tow-3ANE
Tower 1	0.69	0.75	0.83*	0.78
Tower 2	0.62	0.85	0.89*	0.78
Tower 3	0.82	0.80	0.76	0.94*

	SFWMD Gauge			
UF Gauge	41-CA3AVG	41-369	41-365	41-3A4
41-1	0.88*	0.87	0.81	0.81
41-2	0.92*	0.90	0.86	0.88
41-3	0.94*	0.92	0.88	0.93
41-4	0.89*	0.87	0.83	0.84

	SFWMD Gauge				
UF Gauge	Hol-S340H	Hol-S340T	Hol-3AS	Hol-3A9	Hol-3A4
Holiday 1	0.95	0.93	0.92	0.97*	0.89
Holiday 2	0.94	0.93	0.93	0.97*	0.91
Holiday 3	0.92	0.89	0.88	0.93*	0.89

* R^2 representing the best relationship between UF gauge and regional station data for predicting future and past water levels along survey routes.

Appendix 1: Alligator Survey Network Nighttime Spotlight Survey Procedures

-Survey routes have been established based on hydrological characteristics, accessibility, and orientation in and around habitats. Current routes will be re-assessed and modified upon completion of the first round of 2003 surveys.

-Surveys routes are of variable length and survey transects of 10km in length have been randomly selected along existing airboat trials for analysis based on analysis of previous surveys and Florida Fish and Wildlife Conservation Commission recommendations.

-Two 10km survey transects will be used in each marsh/estuarine study area. Subsequent transects and routes may be added if they are determined to be beneficial/necessary.

-One 10km survey transect will be used in each canal study area. This is based upon variability of power analysis of past A.R.M. Loxahatchee NWR survey data.

-Observers will be trained according to the following methods and will not be the primary observer until such time as they have demonstrated acceptable proficiency at size estimation:

- Trainees will participate on several surveys as recorders. During this time, several hand grab size animals will be captured and measured for comparison to estimates.
- Trainees will participate in more surveys and both trainer and recorder will make size estimates for comparison. Only the trainers estimate will be retained for the survey data. Some small animals will continue to be captured.
- Trainee will participate in gator catch and estimate size as soon as possible after an animal is observed. Size estimates and actual size will be compared for accuracy.
- The trainee will continue to participate in catches and surveys until it is deemed that they possess sufficient skill/experience to be a primary observer.

Current survey areas include:

- LOX, A.R.M. Loxahatchee N.W.R. (WCA1)
- WCA2
- WCA3 (Three routes-3AHD, 3ATW, and 3AN41)
- Everglades National Park (Four routes- Shark River, Shark Slough, Frog City, L-67)

Appendix 1: continued

-Surveys will be conducted twice in the spring (dry season) and will not be conducted in marshes where water levels are equal to or less than 6 inches. This period is selected to record maximum concentrations of alligators. The first surveys will be conducted before April 1st or at such time as to allow the second surveys to be completed before water levels drop below the established 6 inches minimum. May 15 will be the last day to complete surveys in order to prevent observing changes contributable to the onset of breeding behavior.

-Surveys will be conducted twice in the fall (wet season) to assess pods and provide an index of reproduction. Surveys will begin in mid-September and the second round will be completed no later than October 31st.

-Surveys will be conducted at least 14 days apart in order to insure independence of counts between surveys.

-Staff gauges will be placed at the beginning, midpoint, and end of each route; excluding Everglades National Park and Lox, which will then be used in conjunction with existing hydrostations to determine the proper date to begin surveys. Staff gauges will be checked and recorded once monthly throughout 2003.

-Surveys will not be conducted during a full moon, heavy rain, wind greater than 15mph, or begun when in-situ water temperature is below 20 degrees Celsius.

-Crews must be at the survey start point (as set forth in individual route guidelines) prior to sunset or wait 30 minutes before beginning survey. Paired marsh/canal surveys performed in the same night for each area must be consistently done in the same order. Order is not important between geographical study areas.

-Size estimates will be in 0.25 m increments with the estimate indicating the lower bound of the size class. Size class estimates that cannot be accurately made should be classed as follows:

Hatchlings = (H)
Small = 0.1 - <1.0m
Medium = 1.0 - <1.75m
Large = ≥ 1.75m
Unknown* = (U) No size estimate could be made using the available information

*Every effort should be made to place an animal into one of the more descript size classes. Only use Undetermined if no inference to the size class can be made.

Appendix 1: continued

-A 200,000 candlepower spotlight will be used by the driver/primary observer. Once animals have been spotted, headlamps may be used to reestablish close proximity eyeshines or to count hatchlings.

-Only animals observed by the primary observer will be recorded.

-Only animals within 50 m of the designated transect will be recorded. Every effort should be made to return to the survey route at the same point and by the same path after deviating from coarse to approach an eyeshine. Animals observed within 50 m of the primary route will be recorded even when observed while going to and from an eyeshine.

- Time, water temp., air temp., water depth, and bedrock depth should be recorded at the beginning, and end of each survey route. These data should be recorded at the staff gauges where applicable.

- Tracks and waypoints of the route will be recorded using map datum WGS 84.

- Waypoints and corresponding UTM's for the location of each individual animal will be recorded in datum WGS 84. Animals within 10 m of each other do not require separate waypoints. Habitat type will be recorded for each animal

- Habitat type should be noted for each observed animal and placed into the most appropriate numbered category from the following:

1 = Open Water	7 = Cattail Marsh
2 = Forested Wetlands	8 = Water Lilly/ Floating Leaved Veg.
3 = Shrubs/Shrub Islands	9 = Canal
4 = Mixed Emergents	10 = Alligator Hole
5 = Sawgrass Marsh	11 = Levee Break
6 = Spikerush Marsh	12 = Mangrove Pond

- All survey protocols will be subject to review, testing, and subsequent modification upon completion of each year the Alligator Survey Network Monitoring Program is in place.