SPECIAL PUBLICATION SJ2010-SP8

ALLIGATOR AND AMPHIBIAN MONITORING ON THE LAKE APOPKA NORTH SHORE RESTORATION AREA: ASSESSING ORGANOCHLORINE PESTICIDE LEVELS AND POTENTIAL BIOMONITORS FINAL REPORT

Final Report

Alligator and Amphibian Monitoring on the Lake Apopka North Shore Restoration Area – Assessing Organochlorine Pesticide Levels and Potential Biomonitors

SJRWMD Contract #25331

FWC/FRWI File Code F2735-08-09F

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May 15, 2010

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LIST OF ACRONYMS

AIC	Akaike's information criterion
FCFWRU	Florida Cooperative Fish and Wildlife Research Unit
FWC	Florida Fish and Wildlife Conservation Commission
FWS	United States Fish and Wildlife Service
g	gram
GLM	Generalized Linear Model
GLMER	Generalized Linear Mixed Effects Model
GPS	Global positioning system
ha	hectare
HTEMP	High air temperature (in regards to movement model)
IOP	Instrument output
K	Body condition index factor
KDE	Kernel density estimator
km	kilometer
LA	Lake unit
LOD	Level of detection
m	meter
MCP	Minimum convex polygon
MDL	Minimum detection limit
n	Sample size
ND	Non detect
NSRA	North shore restoration area
OCP	Organochlorine pesticide
P1	Phase 1 (also referred to as U2W)
P2	Phase 2
SEA	Season (in regards to movement model)
SJRWMD	St. Johns River Water Management District
TL	Total length
TRV	Toxicity reference value
U2W	Unit 2 West (also referred to as P1)
UF	University of Florida
UNIT	Capture unit (in regards to movement model)
USGS	United States. Geological Survey
WLEV	Water level (in regards to movement model)

EXECUTIVE SUMMARY

The 1998-99 avian mortality event on the North Shore Restoration Area (NSRA) of Lake Apopka prompted research on the effects of organochlorine pesticides (OCPs) on local piscivorous birds and other wildlife. Alligators may be susceptible to bioaccumulation of contaminants found in wetlands due to their long lives and high trophic level. They may be a useful environmental indicator of OCPs because of these life history traits and their relatively small home range. Amphibians may also be good indicators of ecosystem health because they readily absorb contaminants through their integument and gastrointestinal tract, have been shown to transmit OCP to their offspring through eggs, and exhibit sub-lethal effects such as physical malformations.

In 2007, a pilot study was initiated on the NSRA to examine alternative monitoring strategies for OCP accumulation within selected impoundments using alligators and frogs. This study provided baseline information about OCP contaminants in populations on the NSRA. Our research in 2008-09 was a continuation of the 2007 project with a primary focus on juvenile alligators. This study was conducted by Florida Fish and Wildlife Conservation Commission (FWC) in conjunction with the St. Johns River Water Management District (SJRWMD), U.S. Fish and Wildlife Service (FWS), U.S. Geological Survey (USGS), and the University of Florida (UF).

The 2008-09 project examined the following objectives:

Objective 1. Determine alligator size structure and distribution on Lake Apopka and the NSRA wetland units by night-light surveys.

Findings. Our surveys and analyses showed a decrease in alligator counts in all wetland units except Phase 1, which increased dramatically after it was flooded in 2008.

Objective 2. Determine alligator nesting distribution and density on Lake Apopka and the NSRA by helicopter or boat searches.

Findings. An aerial nest survey conducted via helicopter in July of 2008 showed that 49 of the 66 total nests in the NSRA were located on levees in the West Marsh, indicating adults are capable of nesting on the NSRA. Nesting densities within the West Marsh were found to be comparable to other central Florida lakes. All nests in the NSRA were on elevated levees or berms as this was usually the highest ground of the surrounding marsh.

Objective 3. Determine movement patterns and home ranges of alligators from the lake and the NSRA wetlands by using radio telemetry.

Movement Findings. We captured 408 alligators ranging from 30-197 cm total length and tracked a subset (n = 96) with radio-transmitters on a weekly basis. Our models showed the probability of an individual moving is inversely proportional to size and dependent on the unit in which it is residing. We documented a net emigration of alligators from the lake into the NSRA, suggesting that they were seeking more suitable habitat than the lake. Body condition data indicated that alligators captured on the lake had significantly lower body condition than those in the marsh, suggesting alligators in the NSRA have greater prey availability.

Home Range Findings. Estimated juvenile alligator mean home range for all units was 56.8 ha and ranged from 38.4-70.2 ha. Alligators in Duda consistently had the smallest home ranges, alligators in Phase 1 and Lake Apopka had intermediate-sized home ranges, and alligators in the West Marsh had the largest home ranges. Female alligators tended to have larger home ranges in general, and there was evidence that some male alligators

occupy two core home ranges. The greatest movement was observed for alligators in the West Marsh, with one individual moving 7.7 km from the West Marsh to Phase 1.

Objective 4. Determine if fasting improves the ability to use blood as a predictor of OCP concentrations in fat in juvenile alligators.

Findings. We concluded in 2008, that blood from alligators (n = 16) fasted for seven days or more may be a useful, noninvasive method for estimating fat and liver concentrations for 4,4'-DDE. The day-7 blood concentrations had significant associations found for 4, 4'-DDE ($R^2 = 0.842$, $P < 0.001$) and total OCPs ($R^2 = 0.548$, $P = 0.001$). In addition, the day-14 blood concentrations of OCPs were positively associated with those of dieldrin ($R^2 = 0.288$, $P = 0.032$), 4, 4'-DDE ($R^2 = 0.726$, $P < 0.001$), and total OCPs ($R^2 = 0.431$, $P = 0.006$).

Objective 5. Determine the utility of using juvenile alligators as an area-specific OCP monitoring tool by evaluating the relationship between the home range of juvenile alligators and OCP concentrations in blood.

Findings. We sampled and tracked 40 juvenile alligators during 2008-2009, and found alligators initially captured from the West Marsh had greater 4,4'-DDE and toxaphene concentrations in blood than other areas. No significant differences were found within units for blood concentrations of lipid, dieldrin, or total chlordane (sum of *cis*-nonachlor, *trans*-nonachlor, oxychlordane, heptachlor epoxide, *alpha*-chlordane, *gamma*-chlordane and heptachlor). Lipid and OCPs in blood were not significantly associated with home range size, with the exception of dieldrin for Lake Apopka alligators. Lake Apopka results suggest that concentrations of dieldrin in blood increased as home range (minimum convex polygon) increased. Total home range (95%) estimations were not significantly associated with concentrations of either lipid or OCPs in blood. For Lake Apopka, core home range (50%) estimations were significantly and negatively associated with total chlordane levels.

Objective 6. Collect a sample of anurans for OCP analysis after the flooding of new NSRA fields (Phase 1).

Findings. In 2008, pig frogs (n =30) were sampled across Phase 1. All OCPs of concern were well below toxicity reference values (TRV) for fish-eating birds.

Objective 7. Survey and collect one alligator hatchling per clutch from year 2007 clutches for OCP analysis, and identify and tag alligator pods hatched in 2008.

Findings. In 2008, we recaptured yearling alligators from the 2007 cohort, which had been sampled for OCPs the previous year, using egg yolk. Since the OCP levels were known, we could investigate the rate of OCP accumulation in yearling alligators over one year. Concentrations of toxaphene and total chlordane in alligator hatchlings were linearly associated with those in eggs. Comparisons indicated eggs had greater concentrations of trans-nonachlor than hatchlings, but lower concentrations of 4.4'-DDT and endrin aldehyde than hatchlings.

In summary, we found that juvenile alligators are more likely to move from the lake into newly flooded restoration units than the reverse, and there is a high probability that juvenile alligators will remain in those units after arriving. Furthermore, we conclude that post-fasting OCP concentrations in alligator blood can be a reliable indicator of environmental OCP levels. Significant alligator nesting is occurring within the NSRA, and egg viability was elevated relative to past levels on Lake Apopka. Hatchling alligators had greater OCP body burdens than

pig frogs. However, OCP levels observed in frogs and alligators pose negligible risk to birds. We suggest monitoring of alligator populations and blood OCP concentrations before, during, and after flooding new units would provide more insight on bioavailability of OCPs to piscivorous birds.

CHAPTER 1
INTRODUCTION

BACKGROUND

Lake Apopka was once world-renowned by sportsmen for its clean water and superior bass fishery (Shofner 1982). At that time, it was a clear lake, fed by springs, rainfall, and storm water runoff, with abundant macrophyte growth and healthy fish populations. By the 1970s, it had become one of the most degraded aquatic ecosystems in Florida (U.S. Environmental Protection Agency 1979). Located about 15 miles northwest of Orlando, Lake Apopka lies between the Mount Dora ridge to the east, and the Lake Wales ridge to the west, and is the beginning of the Ocklawaha chain of lakes. Historically, Lake Apopka was Florida's second largest lake, exceeded in size only by Lake Okeechobee. In the 1940s, the Zellwood Drainage District, a consortium of vegetable farms, diked and drained an extensive marsh on the north side of the lake to make the rich peat soil available to vegetable farming (Shofner 1982). Over the next decade, approximately 8,000 ha of marsh were drained, relegating Lake Apopka to Florida's fourth largest lake (Shafer et al. 1986). Historically, vegetable farms along the north shore were shallowly flooded after every growing season to reduce soil erosion and combat nematodes. Fallow fields were usually flooded during the summer months, and the water was pumped back into the lake prior to the fall planting season. This influx of wastewater was a major source of nutrients (nitrogen and phosphorus) into the lake (SJRWMD 2004).

Other sources of pollution to the lake include a reported chemical spill in 1980 at Tower Chemical Company located near the Gourd Neck area of the lake (U.S. EPA unpub. report), and discharge from citrus processing plants, and sewage from the city of Winter Garden in the southern part of the lake. This addition of nutrients to the lake caused algal blooms, which destroyed much of the aquatic macrophytes in Lake Apopka. The shift from macrophytes to algae is thought to have subsequently disturbed the nutrient cycling process of the system (Conrow et al. 1989).

Organochlorine pesticides (OCPs) were widely used from the 1940s to 1980s for crop pest control in the drained peatlands. Pesticides and fertilizers were selectively applied to various farmlands in central Florida for vegetable and corn production. Aldrin, chlordane, DDT, dieldrin, endrin, and heptachlor were used as pre-emergence soil insecticides (Natural Resource Council 1977).

The Lake Apopka Restoration Act (LARA) of 1985 (Chapter 85-147, Laws of Florida) and the Lake Apopka Surface Water Improvement and Management (SWIM) Act of 1987 (Chapter 85-97, Laws of Florida) initiated efforts to improve water quality in the lake. A portion of the farmland was acquired on the west side of the Apopka-Beauclair Canal to develop a marsh flow-way system that filters lake water to remove phosphorus (SJRWMD 2006). In 1996, the Lake Apopka Improvement and Management Act (Section 373.461, Florida Statures 1996) determined that it was in the public interest to pursue a buy-out of all of the farms and restore agricultural lands along the north shore to wetlands. The St. Johns River Water Management District (SJRWMD), along with the U.S. Department of Agriculture's Wetland Reserve Program, implemented a buy-out plan to purchase the remaining farms. These two agencies focused on restoring the north shore to marsh and modifying the levee arrangement that disconnected the original marsh system (SJRWMD 2004). Currently, the main management objectives of SJRWMD on Lake Apopka are to reduce phosphorus in the lake, restore wetland

habitat, and establish a scientific framework for restoring the eastern units of the North Shore Restoration Area (NSRA) (SJRWMD 2006).

In 1998, when the land purchase from farmers was completed, fields were left flooded with 46 cm of water after the final summer harvest in an effort to deter growth of terrestrial vegetation and prevent contaminated water from returning to the lake. In the fall of 1998, migrating birds began to forage on these flooded agricultural fields. Subsequently, there was a significant bird mortality event during the winter of 1998-1999, which was attributed to OCP poisoning from residual pesticides (SJRWMD 2004, Sepúlveda et al. 2005). A wide range of piscivorous birds were affected, presumably by eating contaminated fish. However, American white pelicans *(Pelecanus erythrorhynchos),* wood storks (*Mycteria americana*), great blue herons (*Ardea herodias*), and great egrets (*Ardea alba*) accounted for most of the fatalities (Exponent 2003). Soon after the first bird mortalities occurred, the SJRWMD began draining the fields, and those fields remained de-watered until 2008 (SJRWMD 2004). The SJRWMD worked closely with its Federal partners to establish protocols for restoring the agricultural fields to wetlands. In 2002, the first 276 ha were successfully flooded, and by 2009, over 3,000 ha of the former fields were undergoing wetland restoration.

RESEARCH AND MONITORING

Wading Bird Investigation

Following the mortality event, a series of studies was undertaken to investigate the effects of bioaccumulation of OCPs by piscivorous (fish-eating) birds inhabiting the NSRA. Bird eggs in nearby areas were assessed for OCP burdens, hatch rates, and eggshell thickness. This provided SJRWMD with an indication of the health of a rookery located in the NSRA (Walton et al. 2004). Studies also showed that mosquitofish (*Gambusia holbrooki*) could potentially serve as a good monitoring tool because their pattern of bioaccumulation matched the distribution of OCPs in the soils (Sepúlveda et al. 2005). However, the home range size of most piscivorous birds may include foraging sites outside the NSRA (Coulter et al. 1999). Therefore it is difficult to assess the amount of OCPs acquired by birds from the NSRA.

Alligator and Amphibian Monitoring Project 2007

In 2007, a pilot study was initiated by the Florida Cooperative Fish and Wildlife Research Unit (FCFWRU) to examine alternative monitoring strategies for OCP accumulation within selected impoundments of the NSRA using American alligators (*Alligator mississippiensis*) and anurans (frogs). NSRA impoundments included in the study were; several cells in the West Marsh, Duda, and Phase 1 (Fig. 1.1). The objectives of the study were to 1) determine alligator nesting distribution and density on Lake Apopka and the NSRA, 2) collect and incubate 30 clutches of alligator eggs from each of the NSRA impoundments and Lake Apopka, 3) determine relative distribution and density of alligators on Lake Apopka and the NSRA, 4) tag and release juvenile alligators within the NSRA to provide a baseline for subsequent observations of movements, 5) collect anuran population data for site occupancy estimation within selected impoundments, and 6) provide anurans, alligator muscle tissue, and alligator egg samples to the SJRWMD for OCP analysis.

The results of this pilot study indicated that alligator and amphibian populations in Lake Apopka and the NSRA were relatively healthy (Appendix A). Further, in 2007, the average alligator egg viability rate for Lake Apopka (0.81) was not significantly different from the egg viability rate for the NSRA (0.73), and these rates were considered relatively high compared to those reported elsewhere in Florida (Woodward et al. 1989, 1993). However, the viability rate in 2007 was markedly higher than past egg viability rates on Lake Apopka (Woodward 1993). OCP concentrations found in the NSRA eggs were significantly higher than the levels in Lake Apopka eggs. OCP concentrations in juvenile alligators varied among impoundments, which suggested they may be a potential monitoring tool. There were no signs of abnormalities in frog specimens collected from the sample locations. Pig frogs (*Rana grylio*) sampled for OCPs had significantly higher concentrations of DDE and oxychlordane in the NSRA compared to Lake Apopka. However, the levels were far below the toxicity reference values (TRV) for wading birds and lower than concentrations found in fish (Appendix A). The OCP results from this 2007 study can be found in appendix G.

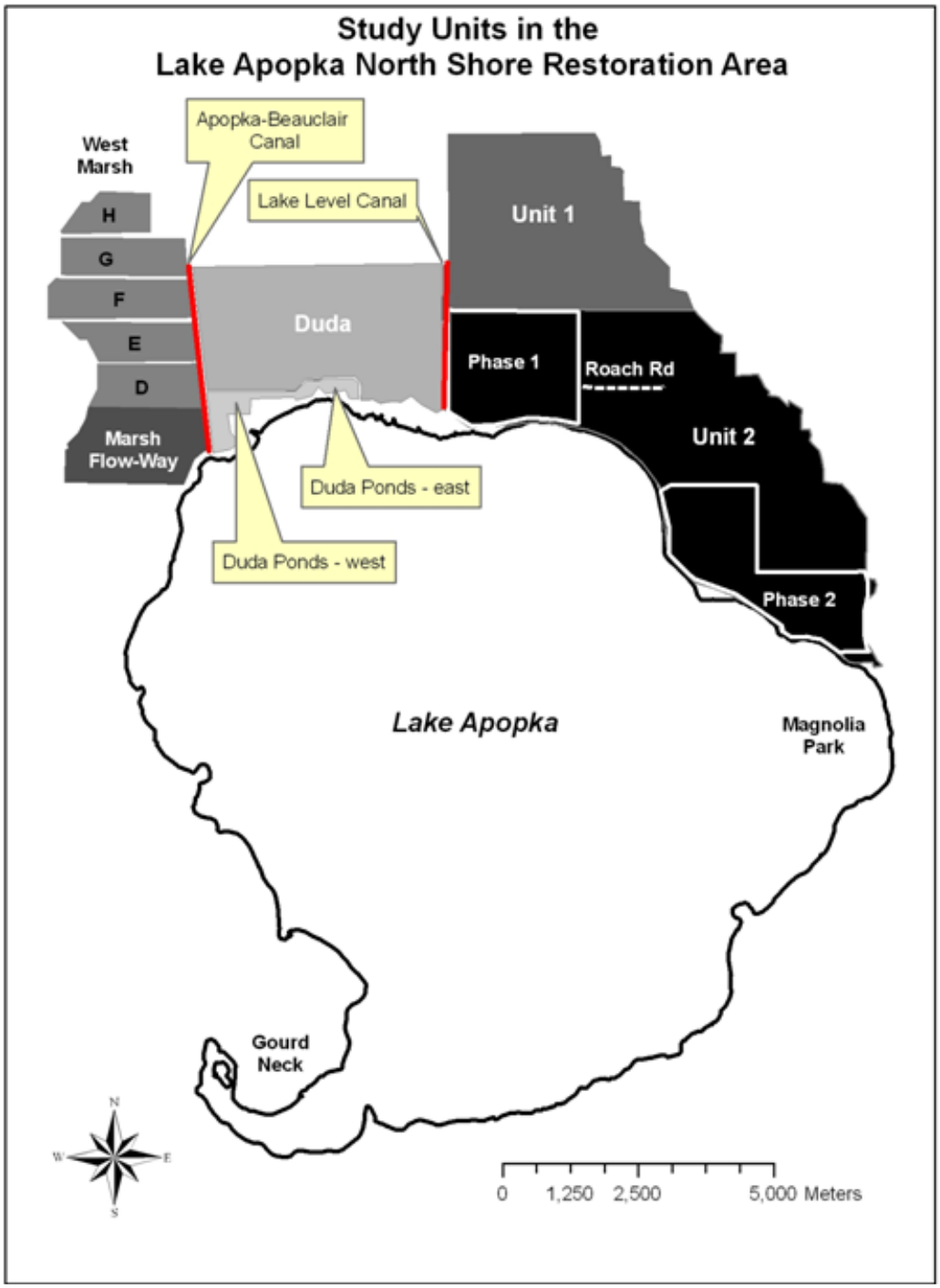

Figure 1.1. Lake Apopka and the North Shore Restoration Area study units; West Marsh, Duda, Phase 1, and Phase 2.

Alligator and Amphibian Research Project 2008–09

The 2007 pilot study provided baseline information about OCP contaminants in alligator and amphibian populations on the NSRA. Our research in 2008 and 2009 was a continuation of the 2007 project with a primary focus on alligators. Although 27 species of piscivorous birds were

known to be affected by the avian mortality event in 1999, wood storks were of primary interest because of their federal listing as endangered (Coulter et al. 1999, SJRWMD 2004). The foraging range of wood storks in north Florida is on average about 12 km from the colony (Coulter et al. 1999) but can be as far as 130 km, depending on food availability (Kahl 1964, Ogden et al. 1978). Fish are the most common food consumed by wood storks, followed by arthropods, plant material, amphibians, reptiles, mammals, and birds (Kahl 1964, Kushlan 1979, Coulter et al. 1999). Due to the uncertainty of foraging locations of wood storks and other wading birds, they were not considered suitable taxa for making inferences about the OCP availability in the NSRA.

Alligators can bioaccumulate contaminants found in wetlands (Delany et al. 1988, Khan and Tansel 2000, Rumbold et al. 2002), due to their long lives and high trophic level (Delany and Abercrombie 1986, Ogden et al., 1974). Because of this, and their relatively small home range (Goodwin and Marion 1979), they may be a useful environmental indicator of OCPs (Campbell 2003, Rauschenberger et al 2004, Milnes and Guillette 2008).

We examined three potential indicators of OCP availability to determine which would be best for long-term monitoring of OCP bio-availability: 1) egg and hatchling OCP levels and survival, 2) OCP levels in juvenile alligators, and 3) OCP levels in anurans. Alligator hatch rate and hatchling survival can be indicators of ecosystem health because adult female alligators tend to have strong site fidelity (Joanen and McNease 1970, Goodwin and Marion 1979) and feed in well-defined area compared to wading birds (Rootes and Chabreck 1993). Alligators also transfer OCPs to eggs (Rauschenberger et al 2004), and have easily identifiable nests.

Juvenile alligators in the 90-150 cm size range may be suitable surrogates for monitoring OCP levels on the NSRA because they occupy similar feeding habitat as wading birds and are less mobile. Previous studies have shown that the average home range sizes of juvenile alligators were 439 ha for females and 565 ha for males (McNease and Joanen 1974), which are smaller than the size of typical management units on the NSRA (SJRWMD 2006). Similar to wood storks, juvenile alligators are opportunistic feeders, and their diet typically includes many of the same prey groups (Chabreck 1972, Delany 1990).

We also examined the health of the anuran population on the NSRA as another method of OCP monitoring. Research has shown that amphibians may transmit OCPs to their offspring through eggs, and that they are susceptible to other types of sub-lethal effects that may impact survival and reproduction (Hayes et al. 2006, Hopkins et al. 2006). Anurans may be particularly good indicators of ecosystem health because they readily absorb contaminants through their integument and gastrointestinal tract (Collins and Storfer 2003). The management program for the NSRA currently reduces risk of birds to OCP exposure by minimizing fish habitat through manipulating water levels to optimize dense, herbaceous wetland vegetation. However, little can be done to prevent establishment of anuran populations. Therefore, examination of OCP concentrations in anurans in the NSRA provided important information in assessing the potential risk to birds that may prey on anurans.

The objectives for the project during 2008 were to: 1) determine alligator size structure and distribution on Lake Apopka and NSRA wetlands by night-light surveys, 2) determine alligator nesting distribution and density on Lake Apopka proper and within NSRA units by helicopter or boat searches, 3) determine alligator movements and home ranges of alligators on NSRA wetlands by using radio telemetry on 60 juvenile alligators, 4) survey alligator hatchlings from year 2007 clutches, and identify and tag alligator pods hatched in 2008, 5) provide alligator samples to the SJRWMD for contaminant analysis, 6) provide one alligator hatchling specimen

per clutch for OCP analysis from the 2007 cohort, 7) collect a sample of anurans for OCP analysis if new NSRA fields are flooded, 8) capture and tag 60–120-cm (2–4-ft) alligators from within NSRA wetlands to provide a baseline for subsequent observation of movements of alligators from one habitat to the other, and 9) determine movements and home range of alligators on NSRA wetlands by using radio telemetry on up to 100 alligators, sizes 90–121 cm (3–4 ft).

The objectives for the project during 2009 were to: 1) conduct surveys of alligators on Lake Apopka and within NSRA wetlands, 2) capture and tag 60–90-cm alligators from within NSRA wetlands to provide a baseline for subsequent observation of movements of alligators from one habitat to the other, 3) provide alligator samples to SJRWMD for contaminants analyses, 4) determine home range and migration of alligators in NSRA wetlands using radio telemetry on up to 100 alligators, sizes 90–121 cm.

STUDY AREAS

The majority of research was conducted on four study units; Lake Apopka, Duda, West Marsh, and Phase 1 (Fig. 1.1). Selection of the four units was based primarily on a gradient of pesticide levels detected in the soils by the SJRWMD (unpublished data) and occupancy by alligators. We also did a small amount of work on an additional area, Phase 2 (Fig. 1.1), which was flooded in the summer of 2009 near the end of our study.

Duda (1203 ha) is located between the West Marsh and Unit 2. It has two retention ponds about 30 cm deep with surrounding cattail (*Typha latifolia*) and willow (*Salix caroliniana*). Water depth range was 0–60 cm, with the deepest areas located in irrigation ditches that transect the unit. Duda represented an area of lower OCP contamination, and it has been flooded or saturated since 2003. Dense cattail stands and willow heads are the predominant vegetation components on Duda, with a few open areas containing smartweed (*Polygonum hydropiperoides)*. The predominant soil type is Everglades, which comprises about half the area. Terra Ceia and Gator soils make up the remainder of Duda (Appendix K).

West Marsh (cells G and H) is a 290-ha area north of the marsh flow-way and west of the Apopka-Beauclair Canal. Water depths ranged from 30–150 cm, with the shallowest areas in cell H. West Marsh soils represent higher OCP contamination relative to the other two study areas, and most of the unit has been flooded since 1994. Willow and cattail stands border the site, with the center comprised of dense hydrilla (*Hydrilla verticillata*), water hyacinths (*Eichhornia crassipes*), and open water. Half of the underlying soil type is Everglades and the rest is a mixture of nine other types (Appendix K).

Phase 1 is a 719-ha site located in the northwest corner of Unit 2. Water depths ranged from saturation to around 150 cm, with the deepest water in the northern sections and the shallowest areas along the southern edge. Abrupt changes in depth occur throughout the unit due to a network of old irrigation ditches. Phase 1 represents an area of intermediate OCP contamination, and has been flooded since 2008. Clumps of willow and cattail are interspersed throughout the site, with open water areas and a few scattered patches of alligatorweed (*Alternanthera philoxeroides*) and duckweed (*Lemna minor)*. The predominant soil type is Gator, with a few patches of Canova and Terra Ceia types (Appendix K).

ACKNOWLEDGEMENTS

This was truly a cooperative project, with participation by The Florida Fish and Wildlife Conservation Commission (FWC), the St. Johns River Water Management District (SJRWMD), the U.S. Fish and Wildlife Service (USFWS), the University of Florida (UF), the Florida Cooperative Fish and Wildlife Research Unit (FCFWRU), and the U.S. Geological Survey (USGS).

We would first like to thank the SJRWMD for their continued support for herptofaunal research on the Lake Apopka NSRA and for funding this project. We are grateful to Jim Peterson, Lorri Lilja, Ellen Bailey, Paul Ek, Don Nickerson, Marc Henderson, Jon Shields and the entire SJRWMD staff at the Lake Apopka Field station for providing data, moral support, assistance in the field, and tow trucks. Sincere gratitude is extended to Patrick Delaney for his tireless help in the field. We also appreciate Dr. Franklin Percival and Dr. Ken Rice for their intellectual support. We give special thanks to Erin Leone, Dwayne Carbonneau, Jason Waller, and Arnold Brunell of the FWC staff for their technical assistance. We particularly thank Erin Leone for providing design and statistical consulting for the project. We also express our gratitude to Harry Robinson, Doug Throm, and University of Florida interns and volunteers who assisted in the field.

CHAPTER 2
ALLIGATOR SIZE STRUCTURE AND DISTRIBUTION

INTRODUCTION

Comparisons of size structure, relative abundance and distribution between wildlife populations can provide an objective indication of the general state of those populations (Lancia et al. 2005). Comparisons of animal abundance over time provide population trend information with which to assess the response of populations to management actions or environmental and human-induced perturbations. Significant portions of wildlife populations are generally not detectable during surveys, thus, estimating population size can be problematic (Lancia et al. 2005). Population indices have been used in lieu of population estimates to assess alligator population trends (Wood et al. 1985). Night-light counts are commonly used to obtain relative abundance of crocodilian populations (Wood et al. 1985, Bayliss 1987, Hutton and Woolhouse 1989), and nest counts are used as an indicator of nest production (McNease and Joanen 1978, Rice et al. 2000). Up to 91% of the total alligator population may go undetected during night-light surveys (Murphy 1977, Brandt 1989, Woodward et al. 1996), and nest surveys may account for only 77% of the total nest production (Rice et al. 2000). Alligator counts from nightlight surveys provide a relative index of alligator population size, and can be used to assess population trends, identify shifts in size structure, and compare relative population status.

Although nest counts can provide some indication of population size and trend (McNease and Joanen 1978), they can be extremely variable, particularly in nesting habitat with dense tree canopy, such as those found on lakes in Florida (Rice et al. 2000). Alligator nest surveys have been conducted on Lake Apopka since 1981. However, the estimated production trend during that period was difficult to assess because of changes in detectability of nests due to changes in the tree canopy Recruitment into the juvenile alligator size classes suggests nest production was adequate to support an expanding population [Woodward et al. 2010 (in prep.)]. The Lake Apopka alligator population underwent a collapse during the early 1980s and has been recovering since 1988 [(Woodward et al. 1993, Woodward et al. 2010 (in prep)]. It is unclear what caused the collapse but OCPs and nutrient-related changes in the lake have been suspected of either directly or indirectly contributing to increased alligator mortality and poor reproductive success [Woodward et al. 2010 (in prep)]. These same factors may be affecting alligator populations in the NSRA.

The objectives of this component of the project were to: 1) determine and compare alligator size structure and distribution on Lake Apopka and the NSRA wetlands, and 2) compare relative nesting among study areas. We used night light surveys and nest surveys to achieve these objectives.

METHODS

Night-light surveys

Night-light surveys (Woodward and Marion 1978) were conducted on Lake Apopka and on the NSRA during 2007-2009. We attempted to conduct two surveys on each unit during May through early June each year, to improve precision in trend analysis (Woodward and Moore 1993). Spring surveys are optimal for night-light counts because alligators are active due to

warming water temperatures. Also, increased mating activity and courtship leads to the highest proportion of adult alligators detected, and reproductive females have not yet moved into inaccessible marshes to nest (Woodward and Marion 1978).

We conducted alligator night-light surveys with an airboat on Lake Apopka and all accessible locations in the NSRA. We used a 200,000 candle-power spotlight, sweeping in an approximate 150º arc in front of the boat. The boat operator counted alligators and estimated sizes, while the passenger recorded data. We operated the survey craft at a speed of 20-25 km/hr, only slowing to get a more accurate count in areas of densely grouped alligators, or in dense vegetation, where sizes are difficult to determine at a high rate of speed. We estimated the size of alligators in one-foot (30-cm) total length (TL) increments using the snout length to TL index as described by Chabreck (1966) and Woodward and Marion (1978). We assigned alligators, that could not be confidently assigned to one-foot size classes, to general size class categories, including 0-61 cm (0–2 ft), 61–122 cm (2–4 ft), 122–183 cm (4–6 ft), ≥122 cm (≥4 ft), ≥183 cm (≥6 ft) and ≥274 cm (≥9 ft). An alligator's size was classified as unknown if no indication of size was apparent and it was observed in areas typically inhabited by all sizes of alligators.

We surveyed accessible areas of cells G and H in the West Marsh. Most areas in these cells were accessible except for willow thickets around the perimeter. Duda surveys consisted of the two retention ponds (west pond and east pond) in the southern portion of the unit. We surveyed all accessible areas of Phase 1, except the south-central portion, which usually was dry.

We conducted 2007 NSRA surveys on 29 May, with a replicated survey on 13 June. Survey areas included the Duda west and east detention ponds, and the West Marsh (cells G and H). The 2008 surveys were conducted on 24 April, with two replicate surveys on the nights of 30 May, 1 June, and the nights of 7 and 10 July. Survey areas included Duda west and east detention ponds, the West Marsh (cells G and H), and Phase 1. We conducted surveys in 2009 on 11-12 May and 4 June. Survey areas included Duda west and east detention ponds, the West Marsh (cells G and H), and Phase 1. We conducted surveys on Lake Apopka in the last week of May with a replicate in the second week of June for 2007, 2008, and 2009. We selected data from the northeast route, which runs along the shoreline, adjacent to the NSRA between the Apopka-Beauclair Canal and Magnolia Park, during 2005, 2006, 2008, and 2009. No surveys were conducted in Phase 2 due to low water levels.

We performed trend analysis on alligator night-light counts of adult (≥183-cm) and juvenile (61-182-cm) alligators to determine population trends for study units. Linear regression was done in statistical analysis software, R, using the mean of the two repeated surveys per unit. Counts were not adjusted for water level due to only having three years of survey data. Phase 1 was only surveyed in 2008 and 2009. For trend analysis purposes, the 2007 count was assumed to be 1 because that unit did not hold any water. In 2007, crews from the University of Florida conducted anuran surveys in Phase 1, and did not observe any alligators within the unit.

Nest surveys

Aerial nest surveys of the NSRA were conducted by two biologists in a helicopter flying at an altitude of approximately 30–40 m and a speed of 40 km/hr. Surveys were conducted 31 July 2007 and 19 July 2008, after the majority of nesting was completed (Goodwin and Marion 1978). We surveyed all areas of the NSRA and the marsh flow-way that had significant water associated with them. Levees are suitable habitat for nesting because they are often the highest ground available, therefore, we focused the nest survey along levees. We counted visible nests

and recorded their global positioning systems (GPS) coordinates. In 2007, we conducted nest searches in the NSRA by foot and by all-terrain vehicles to complement aerial nest surveys and collect eggs for incubation.

RESULTS

West Marsh night-light surveys

Alligators in the West Marsh were discernibly larger than alligators in other study areas during 2007 (Fig. 2.1–2.3). The size distribution in 2008 was similar to the 2007 size distribution (Table 2.1). However, in 2009 the number of alligators in smaller size classes decreased relative to previous years (Table 2.1). More alligators were counted in 2007 than in 2008 and 2009 (Table 2.1; Fig. 2.1). Trend analysis for alligators showed a slight decrease in counts for juvenile alligators (Fig. 2.6d) as well as for adult alligators (Fig. 2.7d), although the trends were not significant (P = 0.25 and 0.49). The percent change in counts for juvenile and adult size classes between 2007 and 2009 was -48% and -16% (Table 2.2). Raw counts from night-light surveys are presented in Appendix B.

Duda night-light surveys

Alligators counted at the Duda ponds in 2007 and 2009 were distributed irregularly throughout all size classes (Fig. 2.2). The size distribution was more evenly distributed in 2008, with most alligators in the 61–91 cm class (Fig. 2.2). Counts in 2009 were the lowest of all years, with just 11 alligators observed (Table 2.1). Counts in Duda were unstable over years (Fig. 2.2). Trend analysis for the Duda Ponds showed a decrease for the juvenile alligators (Fig. 2.6a) and no trend for adult alligators (Fig. 2.7a), although trends were not significant (P = 0.62 and 0.90). Percent change in counts for the juvenile and adult size classes was -90% and 14% (Table 2.2). Raw counts from 2007-08 night-light surveys are presented in appendix B.

Phase 1 night-light surveys

Flooding of Phase 1 in 2008 began in April at approximately the same time surveys began. Alligators were difficult to detect south of Roach Road due to dense vegetation. Very few adult alligators were detected in Phase 1 (Fig. 2.3). However, the counts of 60–121cm alligators steadily increased during Jun-Sep 2008 (Appendix B). Counts of alligators in Phase 1 were considerably higher in 2009 than in 2008, with alligators in the 61-152-cm range most frequently observed (Fig. 2.3). Total number of alligators increased from 115 to 234 alligator between 2008 and 2009 (Table 2.1). We observed a shift in the size distribution from smaller to larger alligator from 2008 to 2009 (Fig. 2.3). Trend analysis showed a significant (P = 0.01 and 0.03) increase in the juvenile (Fig. 2.6c) and adult size classes (Fig. 2.7c). Counts increased considerably during 2007-2009, with 19,200% for juveniles and 1,100% for adults (Table 2.2). Raw count data from 2007-08 night-light surveys are presented in Appendix B.

Lake Apopka night-light surveys

We observed near record numbers of alligators on Lake Apopka during 2007 and 2008. However, in 2009, we observed a remarkable drop off in counts (Table 2.1, Fig. 2.4). We observed a decrease in counts along the northeast route of Lake Apopka in 2009 relative to previous years (Fig. 2.5). Both adult (Fig. 2.7b) and immature (Fig. 2.6b) alligators on Lake Apopka decreased from 2007-09, although the declines were not significant (P = 0.44 and 0.19). The percent change for juvenile and adult alligators on Lake Apopka was -93% and -42% respectively (Table 2.2). Raw count data for 2007-08 night-light surveys are presented in Appendix B.

Nest Surveys

We counted 45 intact nests from aerial surveys on Lake Apopka in 2007. We found 57 intact nests, 1 flooded nest, and 1 depredated nest on the NSRA in 2007; 38 nests in West Marsh, 15 nests in Duda, and 4 nests in Phase 1. In July 2008, only the NSRA was surveyed, and we found 49 nests in the West Marsh, 7 nests in Duda, and 10 nests in Phase 1 (Fig. 2.8). All nests in the NSRA were on elevated levees or berms (Fig. 2.8). We found mean ha of nesting habitat per nest within the West Marsh (21.0) to be comparable to other central Florida lakes; Orange Lake = 19.6, Lochloosa Lake = 77.5, and Lake Woodruff = 85.5 (Woodward et al. 1992)

DISCUSSION

The West Marsh had higher counts and a greater proportion of adult alligators compared to other units in the NSRA. Alligator counts and size structure were relatively stable in the West Marsh during the 3-year study. Counts in Duda, conducted in 2007 and 2008, indicated that alligators were evenly distributed among size classes, although counts were low relative to the other study units. Duda ponds were almost dry in 2009, with a few pockets of available water in which alligators could be found and boats could survey (Table 2.3). This lack of available water likely explains the decrease in alligator counts from previous years. We documented a steady increase of juvenile alligators in Phase 1 from flooding in the spring of 2008 into the summer months. Night-light counts of alligators decreased in all units except for Phase 1, which had a dramatic increase in the juvenile alligator population. Counts during 2008 and 2009 indicate juvenile alligators are the first to colonize a newly flooded wetland, and the number of larger alligators increase at a slower rate over time. This could be a function of prey type availability and habitat characteristics. Counts on Lake Apopka decreased in 2009 when compared to the previous two years. Examining Lake Apopka in more detail, night-light counts along the northeast route decreased substantially, which could have been associated with the flooding of Phase 2. Overall, we documented a decrease of alligators in Lake Apopka and Duda and an increase of alligators in Phase 1. Interestingly, an analysis of Lake Apopka survey data from 1988 indicates the alligator population increased substantially from 1988-1998, dipped during the 2000-2003 drought, increased during 2004-2007, then dipped again from 2007-2009 (Fig. 2.9). These fluctuations may be due to changing water conditions and migration of alligators in between Lake Apopka and the NSRA in response to changing conditions. These short-term fluctuations demonstrate the need for long term monitoring of the alligator population if reliable long-term

trends are to be obtained. Due to the small sample of count data (n = 3 years) trend analysis could not be adjusted for water levels in this study. Water level can account for some variability in counts and improve precision in trend analysis. Water levels fluctuated throughout the study areas during 2008-2009 (Fig 2.10) and the NSRA levels were closely related to Lake Apopka level. Long term water level data for Lake Apopka shows the variability between years (Figure 2.11). Water level seems to have an effect on detecting juvenile alligators (Woodward and Moore 1993). When water declines, juvenile alligators tend to emerge from vegetative cover in the shallows and venture into remaining water, which is frequently open. And they return to vegetative cover when water rises again. When water levels are low in the NSRA, marsh impoundments are more susceptible to drying than the lake, so alligators may concentrate in the lake during low rainfall years. During periods of normal or high water levels, alligators of different sizes and sexes use wetland habitats differently. In general, previous studies have found males prefer open, deeper water areas; females, along with hatchlings and yearlings are found in small ponds in a marsh wetland; and juveniles and sub adults are transient, essentially occurring spatially and temporally where adults are not found (Goodwin and Marion 1979; Joanen and McNease 1970, 1972; McNease and Joanen 1974). This tendency for alligators to move in response to changing water levels may affect counts and the reliability of night-light surveys for trend analysis (Woodward and Marion 1978, Wood et al. 1985).

Night light surveys are the most efficient and effective method to monitor alligator populations in lake and open marsh habitats. More years of count data will allow adjustment for water level in analyses and account for some of the variability in counts over time. This will allow a more precise assessment of alligator population trends within the NSRA.

Alligator nests observed in the NSRA were typically located on levees. This is likely due to the relatively high elevation of levees compared to the adjacent marsh. The Duda impoundment was drier than Lake Apopka and the West Marsh in 2007-2008. Lack of nearby deep water may discourage female alligators from nesting, which could explain the low number of nests found in Duda. Lack of nesting in Phase 1 is probably due to few adult alligators inhabiting that unit during 2008 (Table 2.1). We expect nesting to increase as more adult alligators move into Phase 1.

Table 2.1. Mean counts from 2-3 replicate night-light alligator surveys in Lake Apopka and three units of the North Shore Restoration Area during 2007-09. Densities (alligators/ha) are estimated from available habitat area.

	Phase 1		**Duda**			**West Marsh**			**Lake Apopka**		
n	3	2	2	3	2	2	3	2	2	2	2
Size (cm)	**2008**	**2009**	**2007**	**2008**	**2009**	**2007**	**2008**	**2009**	**2007**	**2008**	**2009**
Hatchlings	0	10	17	0	0	6	10	8	132	239	28
30-60	8	18	0	3	1	10	14	9	622	693	34
61-90	49	76	10	20	0	23	20	21	466	384	37
91-121	37	77	7	6	0	24	9	9	162	103	4
122-151	10	26	2	4	0	14	11	8	97	71	6
152-182	5	13	1	6	2	27	10	8	71	60	5
183-212	4	7	7	4	0	41	28	19	155	158	64
213-243	2	5	0	1	6	27	17	22	77	87	48
244-273	0	0	0	2	2	13	16	20	25	73	43
274-304	0	0	0	2	0	13	10	12	45	42	26
305-334	0	0	0	2	0	8	9	8	42	38	13
335-365	0	0	0	2	0	4	3	5	21	10	11
366-395	0	0	0	0	0	0	0	2	12	2	7
≥396	0	0	0	0	0	0	0	0	0	0	2
61-182	100	193	21	36	2	87	51	45	796	619	52
≥183	7	12	7	13	8	106	83	89	376	411	215
Total	115	234	44	53	11	209	158	151	1926	1961	329
Habitat (ha)	379		100			290			2077		
Juvenile density	0.29	0.58	0.37	0.40	0.03	0.35	0.26	0.21	0.74	0.73	0.05
Adult density	0.02	0.03	0.07	0.13	0.08	0.36	0.28	0.31	0.18	0.20	0.10

Table 2.2. Percent change in counts for juvenile (61-182 cm) and adult (≥183 cm) from alligator night-light surveys in Lake Apopka and the North Shore Restoration Area during 2007-09.

		Count			
Size class	**Area**	**2007**	**2008**	**2009**	**% Change**
61-182 cm	Duda	21	36	2	-90
	Lake Apopka	796	619	52	-93
	Phase 1*	1	100	193	19,200
	West Marsh	87	51	45	-48
≥183 cm	Duda	7	13	8	14
	Lake Apopka	376	411	215	-42
	Phase 1*	1	7	12	1,100
	West Marsh	106	83	89	-16

* Survey not conducted in 2007, count was assumed to be 1, due to no available water within unit.

Table 2.3 Estimated percent coverage of water in the Duda Ponds based on aerial photos.

	% cover		
Date	West Pond	Middle Pond	East Pond
7/6/2007	95	95	90
12/6/2007	95	95	90
3/25/2008	80	80	75
7/3/2008	35	40	5
3/5/2009	40	70	30
9/24/2009	10	30	5
1/4/2010	20	40	5

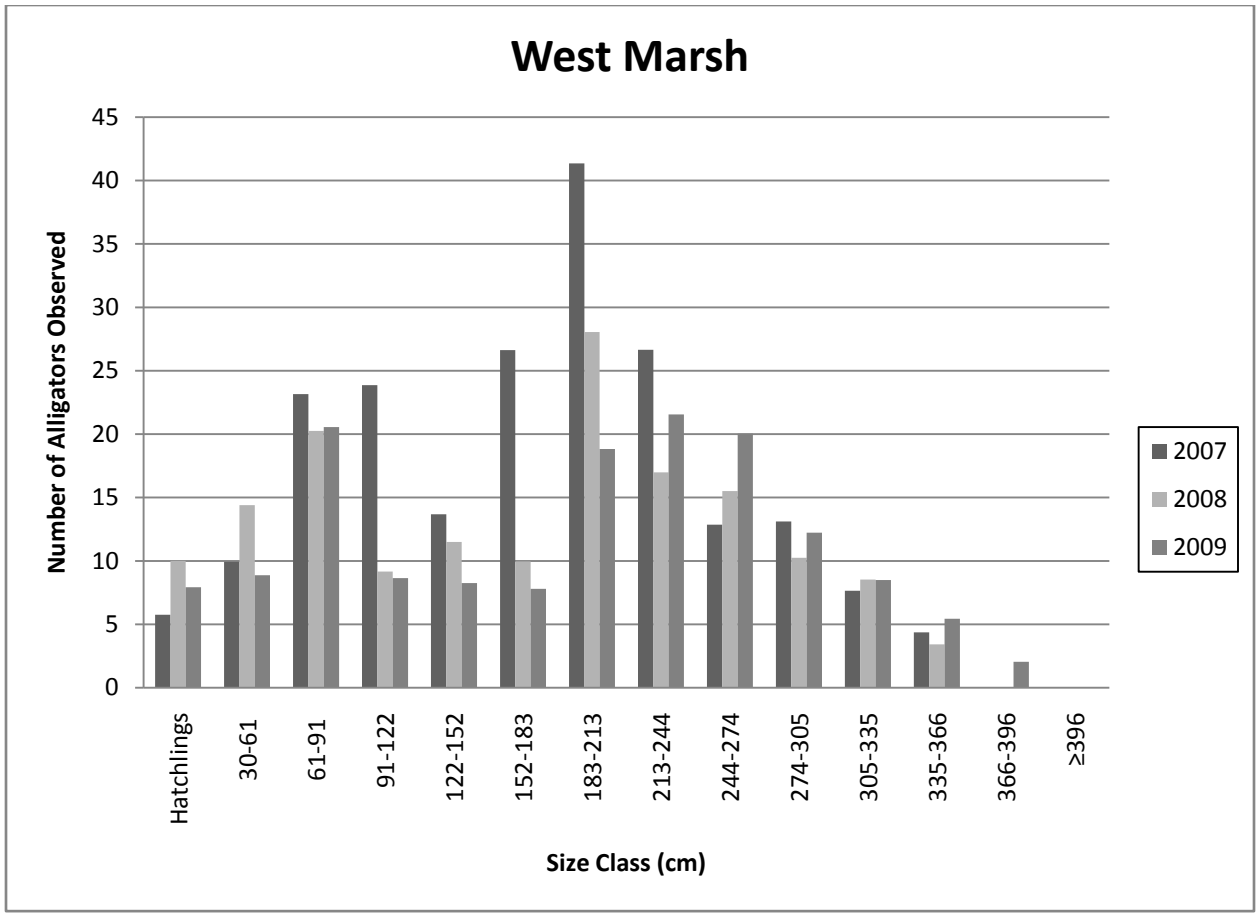

Figure 2.1. Alligator size distribution from night-light counts in the West Marsh (cells G and H) of the North Shore Restoration Area of Lake Apopka during 2007-09.

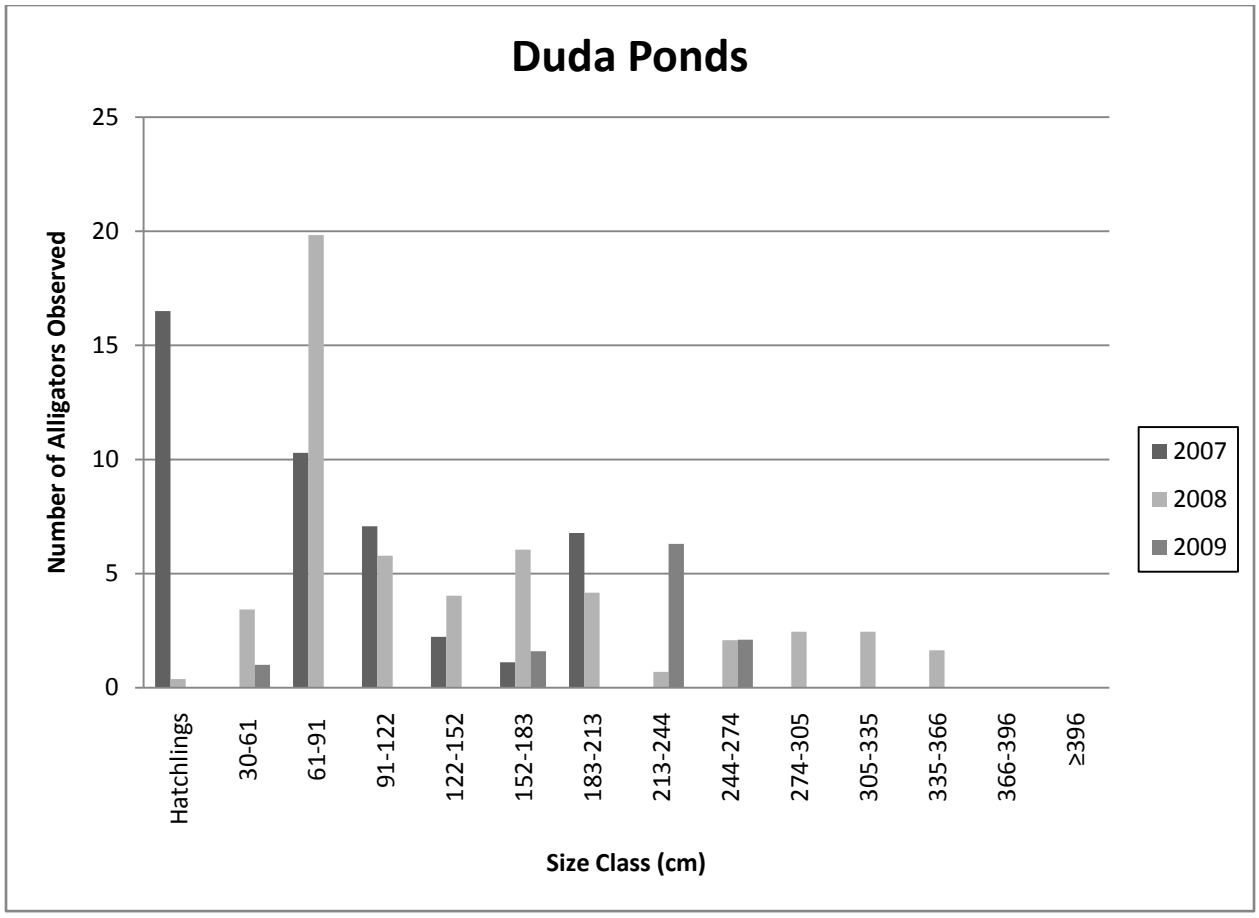

Figure 2.2. Alligator size distribution from night-light counts in Duda (east and west ponds) of the North Shore Restoration Area of Lake Apopka during 2007-09.

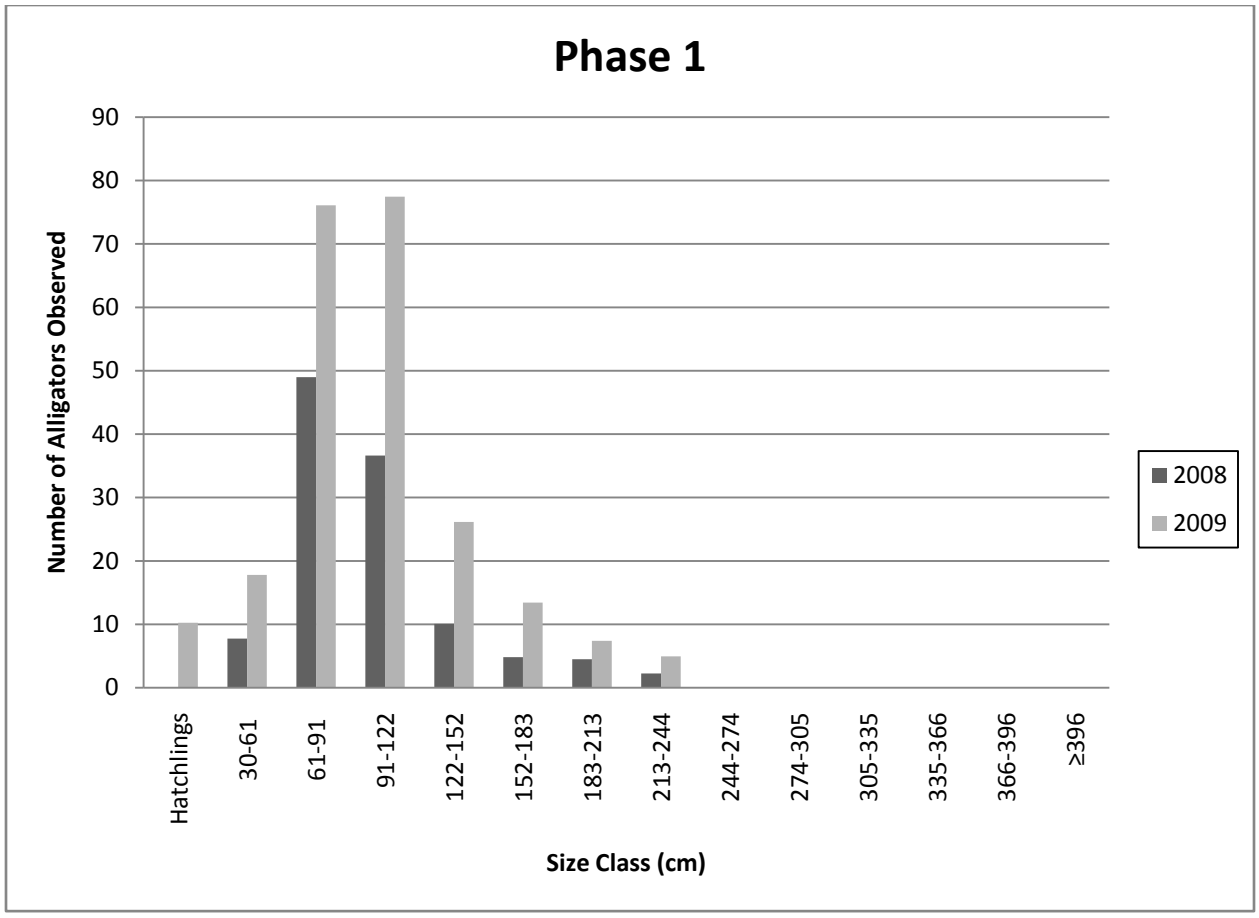

Figure 2.3. Alligator size distribution from night-light counts in Phase 1 of the North Shore Restoration Area of Lake Apopka during 2008-09.

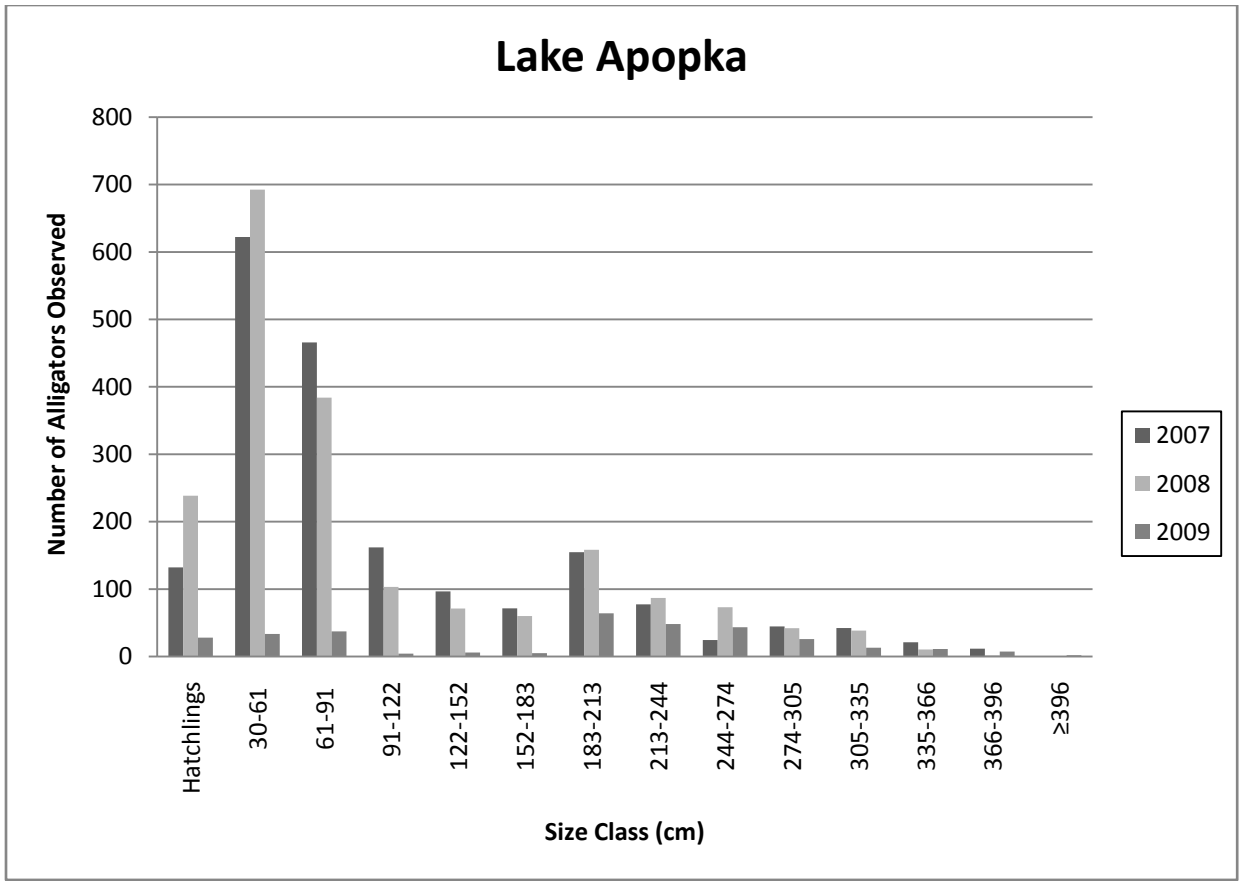

Figure 2.4. Alligator size distribution from night-light counts in Lake Apopka during 2007-09.

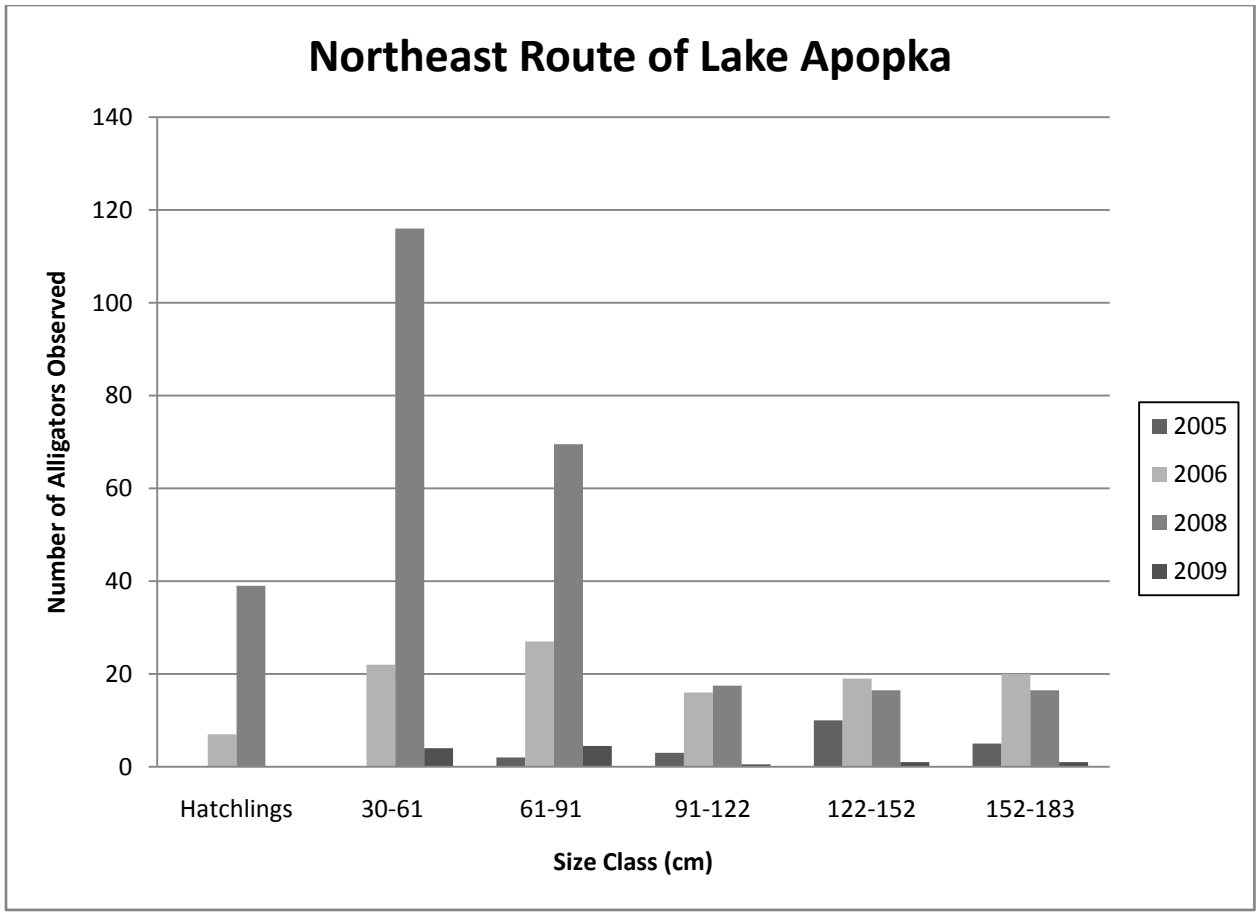

Figure 2.5. Alligator size distribution for 0-182-cm alligators observed along the northeast route of Lake Apopka during 2005-2009. The route extends from the Apopka-Beauclair Canal along the north shore to Magnolia Park.

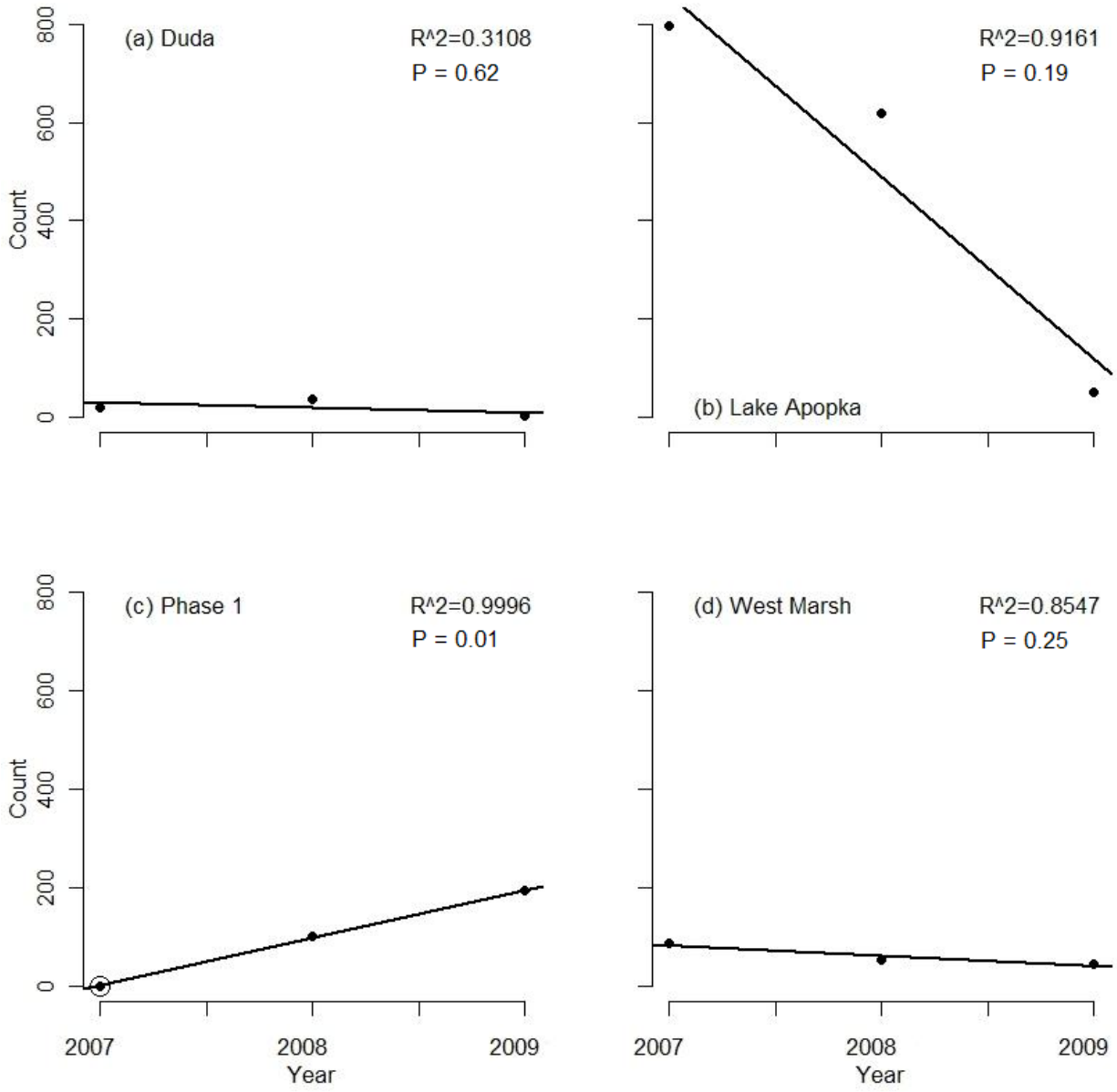

Figure 2.6. Trend analysis of alligators 61-183 cm in Lake Apopka and the North Shore Restoration Area for 2007-09. Count for Phase 1 in 2007 assumed to be 1. A significant increase was observed in Phase 1(P = 0.01).

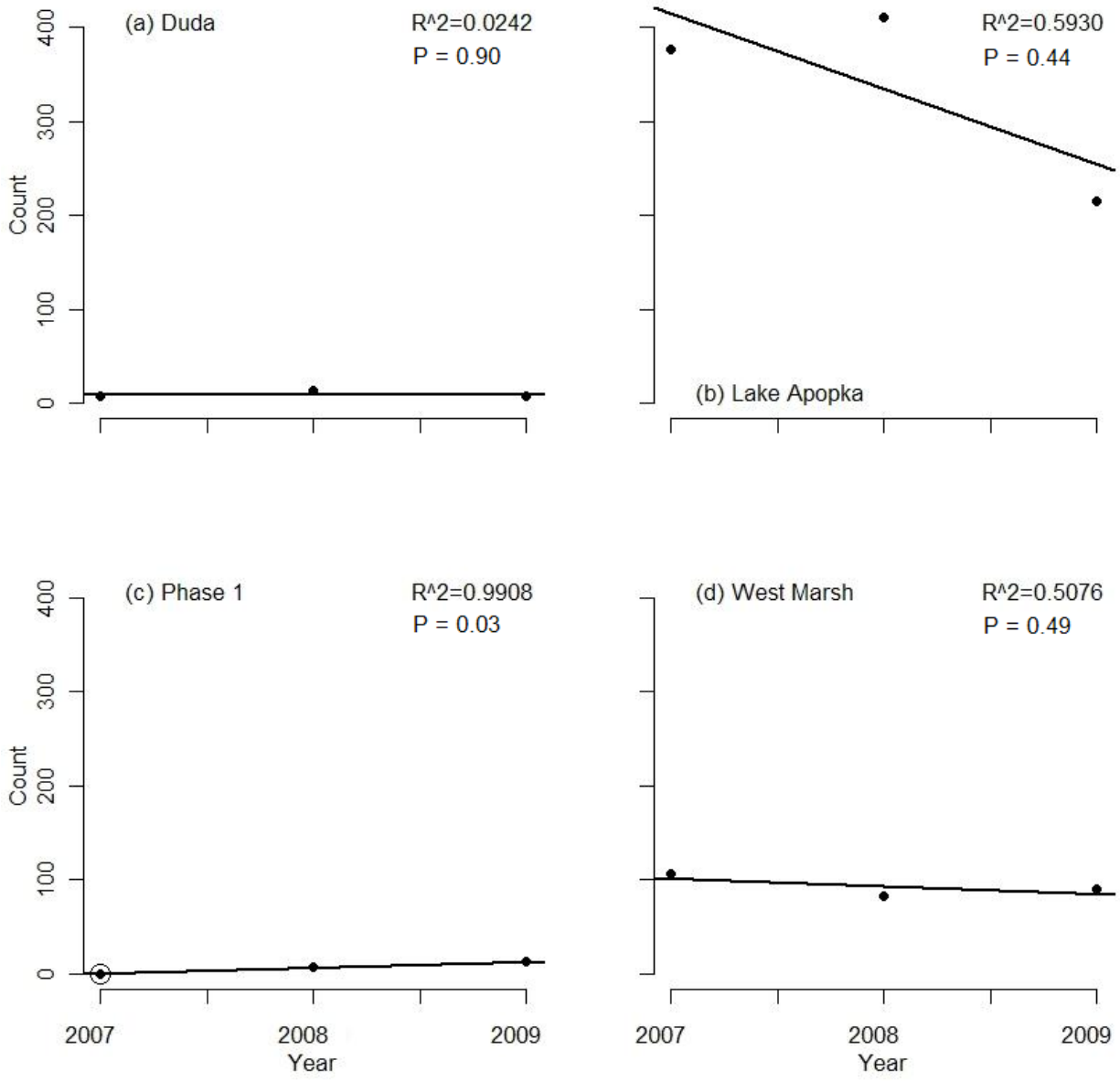

Figure 2.7. Trend analysis of alligators ≥183 cm in Lake Apopka and the North Shore Restoration Area for 2007-09. Count for Phase 1 in 2007 assumed to be 1. A significant increase was observed in Phase 1 (P = 0.03).

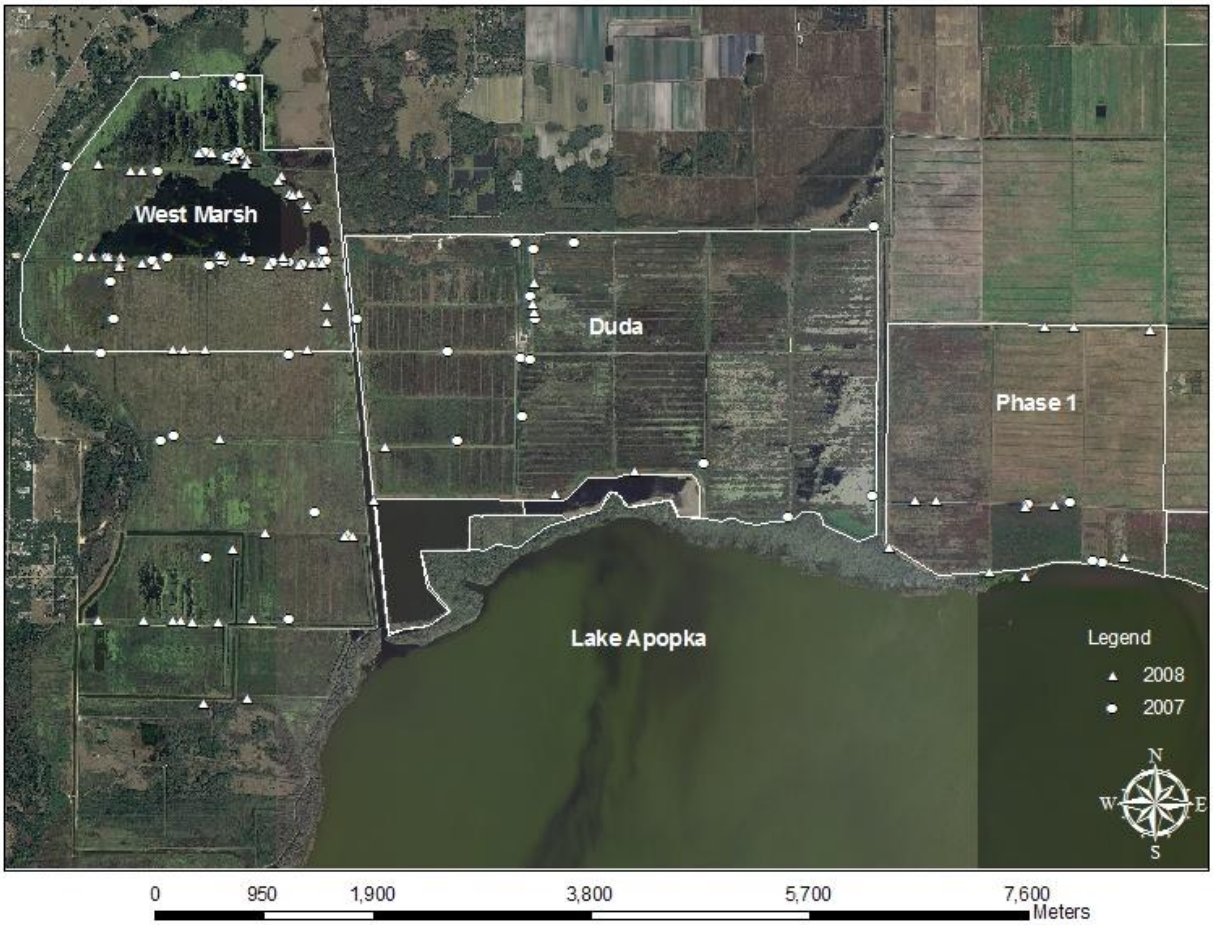

Figure 2.8. Distribution of alligator nests found from helicopter and ground surveys in the North Shore Restoration Area of Lake Apopka in July, 2007 and 2008.

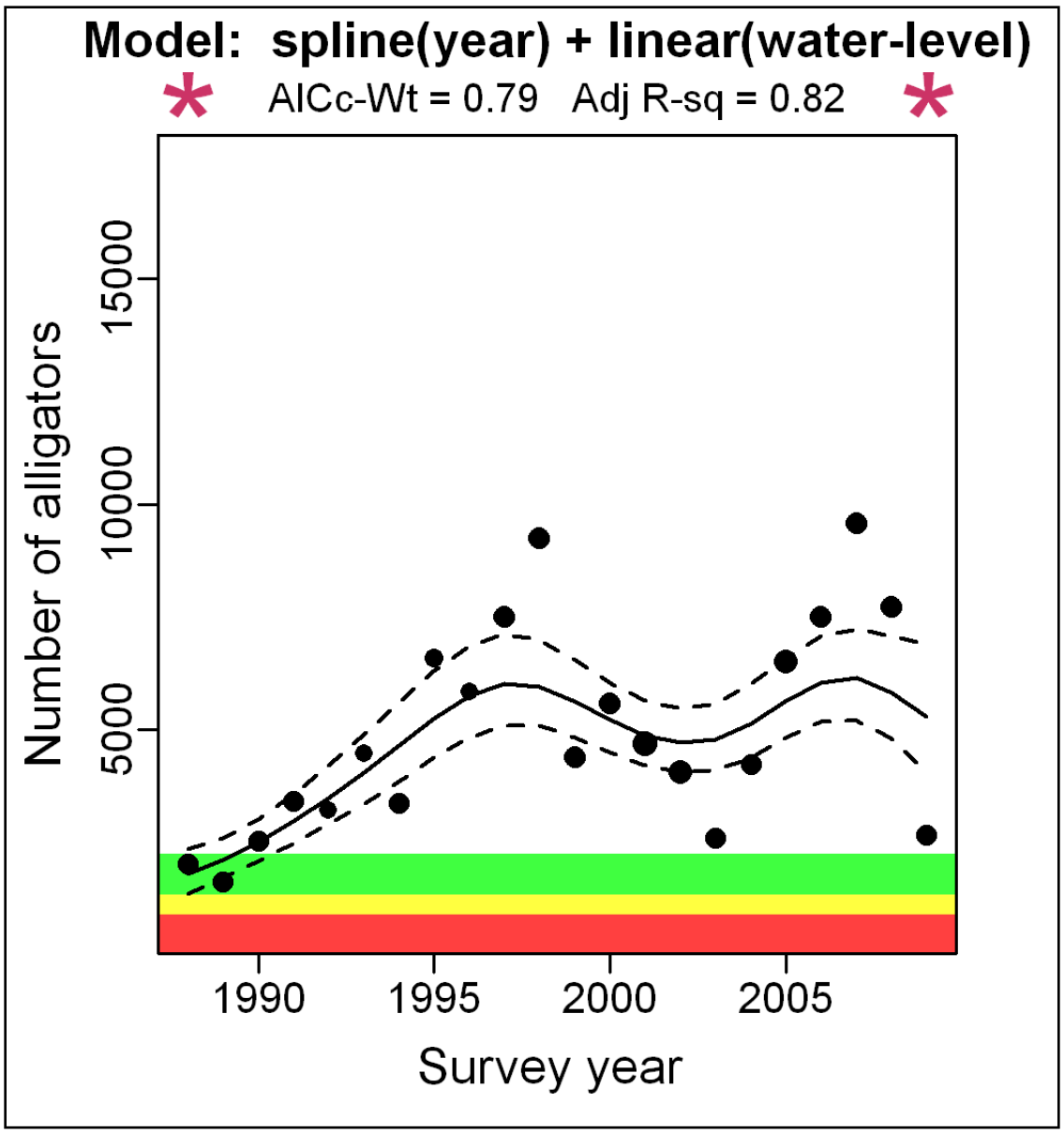

Figure 2.9. Estimated population of alligators on Lake Apopka from 1988 to 2009. Model was selected by AIC weight from a set of six generalized additive models based on spline and linear effects of year and water level.

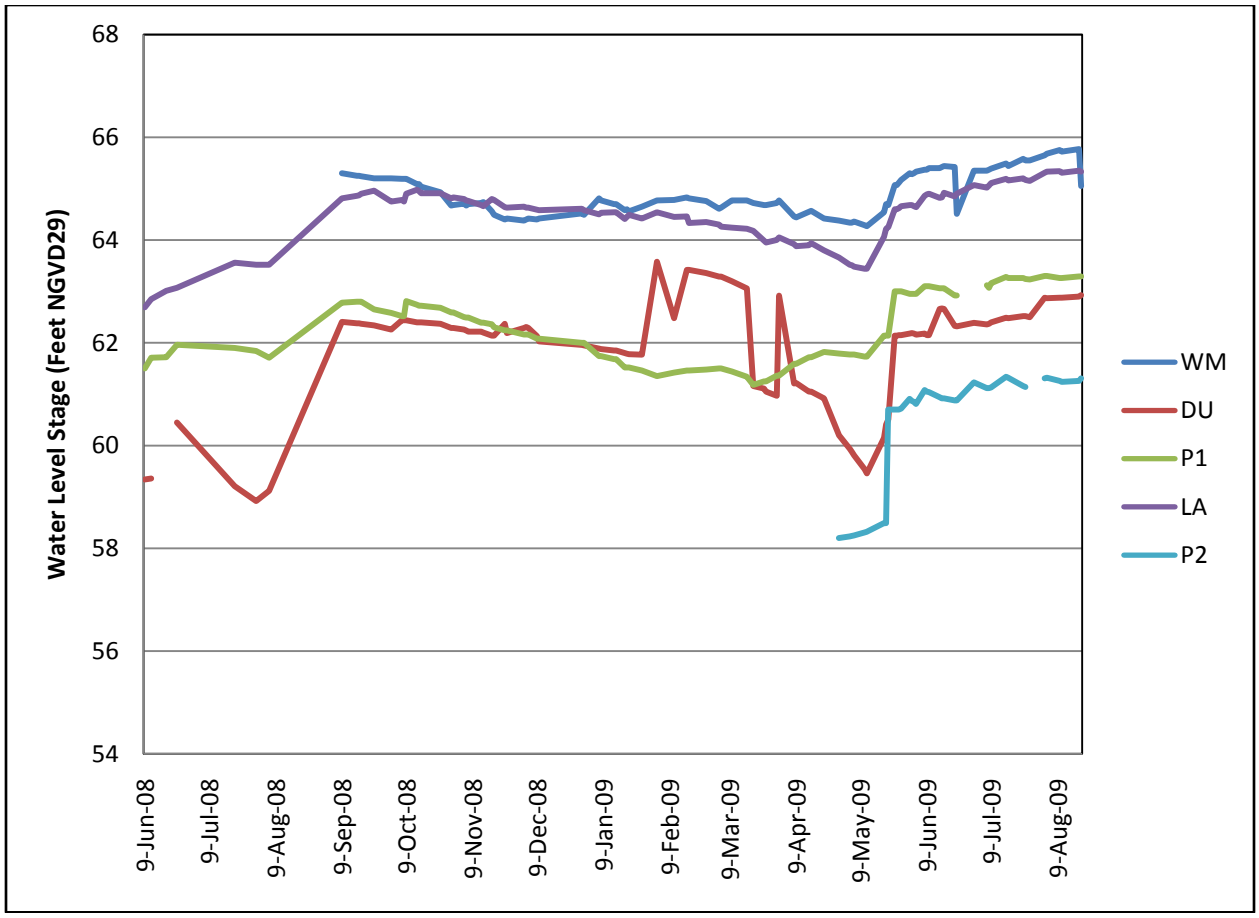

Figure 2.10. Water levels for Lake Apopka and the NSRA for 2008-2009. Areas are Duda (DU), Lake Apopka (LA), Phase 1 (P1), Phase 2 (P2), and West Marsh (WM).

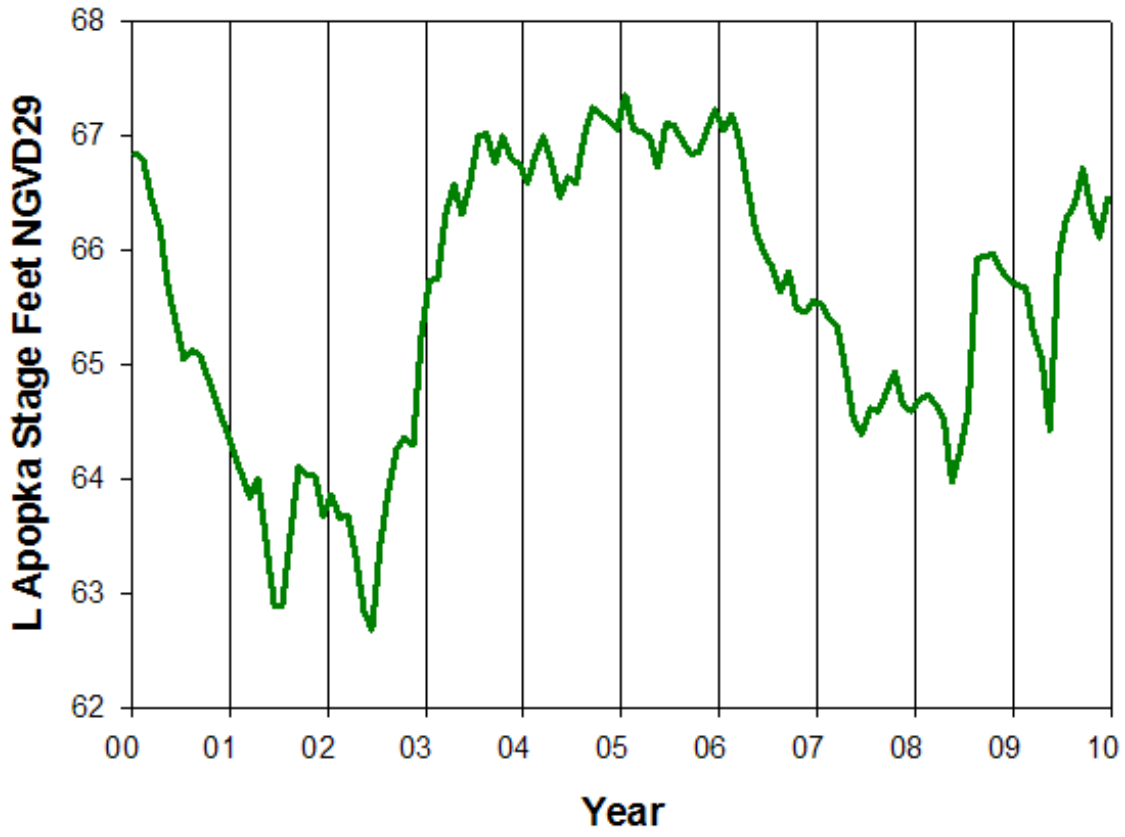

Figure 2.11. Water level for Lake Apopka from 2000-2010. The thirty year mean level is 66.7 ft NGVD29

CHAPTER 3
ALLIGATOR SITE FIDELITY AND MOVEMENTS

INTRODUCTION

The SJRWMD had been concerned with OCP bioaccumulation in piscivorous birds and other wildlife on the NSRA since the avian mortality event in 1999. Juvenile alligators in the 90-150 cm size range may be suitable surrogate for monitoring OCP levels in piscivorous birds on the NSRA because they feed on similar species and sizes of prey, and they are less mobile. In addition to having a smaller home range, juvenile alligators may eat approximately the same mixture of fish, invertebrates, amphibians, and reptiles as some piscivorous birds (Chabreck 1972, Coulter et al. 1999, Delany 1990, Kahl 1963, Kushlan 1979). In previous work on the NSRA, OCP levels measured in juvenile alligators varied among management units, suggesting that OCP body burdens of an individual alligator are reflective of OCP levels within their home range (Appendix A). We considered adult alligators to be less suitable candidates as indicators of contaminant bioavailability because they have larger home ranges and the ability and propensity to move greater distances than juvenile alligators (Joanen and McNease 1970, Joanen and McNease 1972, McNease and Joanen 1974). Also, the diet of adult alligators (Delany and Abercrombie 1986, Delany et al. 1999) is less similar than juvenile alligators to piscivorous bird diets (Khan and Tansel 2000).

Mark-recapture studies are frequently used for determining movements of fish and reptile populations (Rutherford and Gregory 2003, Bolle et al. 2005, Quiroz et al. 2009). Although mark-recapture experiments do not provide information about the extent and direction of movement during the period between captures, they can provide insight into coarse population movements (Bolle et al. 2005). Marking animals bordering a study area can improve estimates of immigration rates and, when used in conjunction with radio telemetry, can generate more reliable inferences about the movements (Powell et al. 2000). However, alligators tend to become warier after capture, and the probability of recapturing a marked animal is thought to decline with each succeeding recapture (Pacheco 1996, Ron et al. 1998). Therefore, findings from mark-recapture experiments may bias estimates of the migration rates.

Home range size can be useful information for assessing the value of juvenile alligators as an indicator species for OCP bioaccumulation in piscivorous birds in the NSRA. One of the main objectives of this study was to determine if OCP body burdens of captured juvenile alligators differed among the flooding units. Home range size of juvenile alligators has not been studied for impounded wetlands adjacent to large lakes. However, a study on impounded wetlands in Louisiana showed that the average home range size of juvenile alligators was 439 ha for females and 565 ha for males (McNease and Joanen 1974), which are smaller than the size of management units on the NSRA (SJRWMD 2006). Further, juvenile alligators have site fidelity, sometimes returning greater than 5 km to their original capture site after being displaced (Rodda 1985). Knowledge of the average home range size for alligators in the NSRA would allow us to better determine if OCP concentrations found in juvenile alligators accurately represent the area in which they are caught. A good method for determining home range utilization and habitat preference is through radio telemetry (McNease and Joanen 1974).

Supplementation of radio-telemetry projects with mark-recapture efforts have proved useful in previous studies (Garrett and Franklin 1988, Rappole et al. 1989, Griffiths and Christan 1996, Holland et al. 1996). Using both methods can increase reliability of survival estimates by

combining two sources of information about the same parameter (Burnham 1993). It also allows for separate inferences on movement, emigration, and mortality rates that are often confounded in complex ways, particularly in studies at broad spatial scales (Powell et al. 2000). Tests of potential radio package effects on survival may be made, which strengthens survival rate estimates (Burger at al. 1991, Peitz et al. 1993, Ward and Flint 1995). Powell et al. (2000) found that precision of recapture and movement rates increased under a model which included mark-recapture and radio-telemetry data. In this study, we conducted mark and recapture to support ongoing radio telemetry findings and provide a baseline for subsequent observation of movements of alligators among impoundments and Lake Apopka. As an added benefit, recaptured individuals can provide information about growth rates of NSRA and Lake Apopka alligators.

The main objectives of this study included determining the probability of movements between study sites, estimating juvenile home range, and marking juvenile alligators for future movement studies.

METHODS

Capture

During 2008 and 2009 we captured 408 alligators ranging in size from 30–200 cm TL. Capture efforts in 2008 consisted of two day and seven night catches. Capture efforts in 2009 consisted of two day and nine night catches. We recorded standard body measurements, sex, and location for each alligator, and we marked alligators with #3 Monel web tags as described by Woodward et al. (1987).

Monitoring movements

We outfitted a subset (n = 96) of marked juvenile alligators with radio transmitters (Advanced Telemetry Systems, Isanti, MN) attached with a backpack-style harness. Radio transmitters were approximately 7.5-cm long, 4.3-cm wide, 3-cm high, and weighed 63 g. We collected blood samples from alligators that received radios, and alligators were transported to and temporarily held at the Florida Fish and Wildlife Conservation Commission, Wildlife Research Lab, Gainesville. Once outfitted with radio-transmitters, we released alligators at their capture sites. All capture and experimental techniques met University of Florida's Institute for Animal Care and Use Committee's guidelines.

We monitored radio-outfitted alligators weekly by triangulation using a truck-mounted null-peak antenna system and a R4000 model receiver. An electronic digital compass was mounted on the antenna to take azimuth readings, and calibration was checked weekly. We used a digital GPS receiver, set for Universal-Transverse-Mercator (UTM) grid coordinates and wirelessly linked to a Palm Pilot. We typically tracked alligators from a pick-up truck using the digital equipment described above. When we occasionally tracked from an airboat, we used a handheld GPS, a handheld antenna, and a manual compass. A study was conducted on the ingestion of radios by larger alligators to ensure we were not tracking adults that preyed on radio out-fitted juveniles (Appendix J).

We used program Locate III software (Nams 2006) loaded on a Palm Pilot to record and plot weekly locations of radio-outfitted alligators. A minimum of three bearings were recorded

for individual alligator locations. When a location was calculated, an error ellipse was also calculated. If the error ellipse was greater than the maximum acceptable error, more bearings were taken. Acceptable elliptical error was maintained around 10,000 m^2, but the majority of locations were well under 2,000 m^2. In addition, all bearings used for one location were maintained within 40 minutes of each other, with the assumption that the alligator would not move an appreciable distance during that time period. Successive locations for each individual were separated by one week and conducted over a one-year span; therefore autocorrelation was not considered an issue (Swihart and Slade 1997). Tracking times were alternated every week between day and night periods to ensure coverage of any key temporal habitat use. Day was defined as sunrise to sunset, and night was defined as sunset to sunrise. Radio locations on the four study units were alternated between day and night. Location data were loaded into the windows version of Locate III after each tracking session.

Movement analysis

Alligator condition was analyzed in this study to determine if differences between body conditions occurred among study units. Due to variable sample size and alligator size distribution among study units, body condition was analyzed for only the 61-90 and 91-121-cm size classes. Fulton's condition factor, K, was used for assessing condition (Zweig 2003), and is described by the following equation:

$$K = W/L^3 \times 10^n$$

where W = weight of alligator in kg, L = alligator snout vent length (SVL) in cm, and n = 5. An analysis of covariance was performed in statistical analysis software, R (R Development Core Team 2005), to determine differences in condition between study units and sex.

Alligators with a minimum of five consecutive weeks of locations (n =77) were used for developing movement probability models. Movement data were converted into binary data, where a one (1) represented movement, and a zero (0) represented no movement. Two groups of models (yearly and weekly) were constructed to examine movement among Lake Apopka and NSRA study units. The first group examined yearly probabilities of moving out of, or into, a given unit. Yearly movement model sets included the variables, UNIT, SEX, and TL, and only included the starting and ending unit for individual alligators. Models were structured as generalized linear models with the GLM package (R Development Core Team 2005). The second group of models examined weekly movement probabilities of moving out of, or into, a given unit. Weekly movement model sets included the variables, UNIT, SEX, Total length (TL), air temperature (HTEMP), season (SEA), and water level (WLEV), and included all locations for individual alligators. These models were structured as mixed effects models with the GLMER package (R Development Core Team 2005). All models used for weekly probabilities had the tag number of individual alligators set as repeated measures random effect. All models to be tested were established *a priori* based on biological and environmental factors thought to influence alligator movements. Probabilities for alligator movements related to size were all reported as total length (TL). We model-averaged the ingress and egress models to estimate movement probabilities among units by males and females and by TL. Averaging models also eliminated or greatly reduced model selection uncertainty (Anderson 2008).

The Akaike Information Criterion (AIC) was used to determine which variables or mixture of variables resulted in the best fit for modeling juvenile alligator movements (Burnham and Anderson 2002, Pollock et al. 2002). AIC helps identify the best fit of models by taking into

account the number of parameters in the model. AIC penalizes additional parameters and therefore selects the best fitting model with a minimal number of parameters. AIC weight represents the probability that the model is the best fit, given data and models tested. The beta parameters represent the covariate slope of the regression line

Location data were also used to estimate juvenile alligator home range. Alligator locations were examined individually to find outliers and associated bearing readings with large error. Most locations had error ellipses <1,000 m^2. Locations with error ellipses greater than 5,000 m^2 were excluded from the dataset for home range analysis. Fifty-three alligators had at least 30 locations, which we deemed as the minimum number required for reliable home range analysis (Seaman et al. 1999). Locations were collected at least 5 days apart to minimize autocorrelation of individual locations. Estimated home range sizes were calculated using the Home Range Tools (Rogers et al. 2005) extension for ArcMap 9.3.1 (Environment Systems Research Institute, Inc., Redlands, CA). Fixed Kernel Density Estimation was used with 95%, 80%, and 50% isopleths to estimate total, primary, and core home ranges. Least Squares Cross Validation was selected for bandwidth, and the utility distribution (UD) was set to minimize the extent of UD for individual alligators (Seaman et al. 1999). An analysis of covariance was conducted in SAS (PROC GLIMIX, SAS 2009) to examine the effect of UNIT, TL, SEX, and MOVED on home range size. The initial model included all two-way and the three-way interactions of TL, SEX, and MOVED. Interactions were shown to have no effect, therefore, the model was reduced to include just UNIT + SEX + TL + MOVED with no interaction effects.

RESULTS

Capture and Recapture

We captured most alligators in Phase 1 (n = 192), followed by the West Marsh (n = 88), Lake Apopka (n = 76), Duda (n = 33), and Phase 2 (n = 12) (Appendix C). We recaptured 20 alligators (<5%), most of which occurred of over a short time period (<1 month). Therefore, we were unable to obtain gross movement patterns or meaningful growth rates from recapture data. Differences were found in body condition between study units for both the 61–90-cm and 91–122-cm size classes (Figs 3.1 and 3.2). The body condition index (K) for alligators from Lake Apopka was significantly lower for the 61–90-cm size class ($P < 0.05$) than it was for Phase 1 and West Marsh alligators and showed some evidence of a difference from Duda alligators ($P = 0.059$). Alligators 91–122-cm on Lake Apopka were in lower condition than similar-sized alligators in Duda ($P = 0.041$), Phase 1 ($P < 0.001$), Phase 2 ($P < 0.001$), and West Marsh ($P < 0.001$) (Table 3.1, Fig. 3.1). We found no alligators within the 61–91-cm size class in Phase 2. Alligators in the 91–122-cm. size class on Phase 2 had a higher ($P < 0.001$) condition score when compared to the other study units (Table 3.1). There were no significant differences ($P > 0.05$) in body condition between male and female alligators for either size class (Fig. 3.3 and 3.4).

Yearly Probabilities of Movements

The best model for explaining yearly movement probabilities for moving out (egress) from a study unit was the model with the covariates, UNIT + SEX + TL, which had an AIC of 60.34 and an AIC weight of 0.50. This indicates that this model correctly predicts movement probabilities 50% of the time. The next best model with an AIC of 61.02 and an AIC weight of

0.36 was the model that included UNIT + SEX (Table 3.2). To estimate yearly movement probabilities, we used an average of the two highest ranked models, which would correctly predict movement probabilities 86% of the time. We did not include models 3 and 4 in the average because there was a clear separation in AIC weights from model 2 (0.36) to model 3 (0.06), and the evidence ratio was slightly higher (Table 3.2). The covariate with the most effect on egress was UNIT, which was found in models that accounted for 100% of the AIC weight. SEX accounted for 91% of model weight and TL accounted for 60% of model weight (Table 3.2).

The best model for yearly movement probabilities of moving in (ingress) to a unit was the model with the covariates, UNIT + SEX. This model had an AIC of 52.99 and an AIC weight of 0.47, and would predict movement probabilities 47% of the time (Table 3.3). The second best model was UNIT + SEX + TL, which had an AIC of 53.69 and an AIC weight of 0.33. The third and fourth models had AIC weights of 0.12 and 0.07 (Table 3.3). We selected an average of the top four models as the best predictor of moving into a unit because there was no clear separation in AIC weights among these models. Model-averaging this set would predict ingress movement probabilities 99% of the time.

The positive beta parameters for yearly movement probability models (Table 3.4) indicated that males had a higher probability of both ingress and egress than did females. The negative beta parameter for TL indicated smaller alligators had a higher probability of movement than larger juvenile alligators.

The mean probability of males and females moving out of Duda depended on size, and was 0.43 at 90 cm, and 0.17 at 150 cm (Fig. 3.5a). The mean probability for moving into Duda ranged from 0.28 for alligators 90 cm to 0.14 for alligators 150 cm. Mean probabilities for moving out of Lake Apopka ranged from 0.85–0.53 for 90–150-cm alligators. The mean probability for moving into Lake Apopka ranged from 0.28–0.14 for 90–150-cm alligators (Fig. 3.5b). No alligators moved out of Phase 1. The probability of alligators moving into Phase 1 ranged from 0.22–0.11 for alligators 90–150 cm (Fig. 3.5c). No movement into the West Marsh was detected, but egress probabilities ranged from 0.19–0.07 for 90–150-cm alligators (Fig. 3.5d). Movement probabilities indicate males of all sizes were more likely to move out of (Table 3.5) and into (Table 3.6) study areas.

Weekly Probabilities of Movement

The superior model for weekly probabilities of egress included the covariates, HTEMP + UNIT + TL, with an AIC of 440.2 and AIC weight of 0.39 (Table 3.7). Although model 1 was the best model, evidence ratios of 1.4–7.7 in models 2–5 indicated some evidence of support for those models. The model-averaging approach suggested for model set 1–5 minimized model selection uncertainty, and provided unbiased estimates of movement probabilities (Table 3.8). The AIC weight sums for the beta variables, UNIT and HTEMP, accounted for 1.0 AIC weight, so we decided those covariates had the greatest effect on movement probabilities (Table 3.8). TL was second with a sum of 0.55, followed by WLEV with a sum of 0.32, and, lastly, SEX with a sum of 0.05. The sum of AIC weights indicated TL and water level had a moderate effect, whereas SEX had very little effect on weekly movement probabilities. Air temperature had a positive effect on weekly movement probabilities, so higher temperature meant a greater probability of alligator movement. Total length had a negative effect on weekly movement, so smaller

alligators had higher probabilities of movement than larger alligators. Water level had a positive effect on movements, so more movement occurred at higher water levels.

The model set for weekly probabilities of ingress indicated the best model had covariates of HTEMP + TL + WLEV + UNIT, with the lowest AIC (420.1) and an AIC weight of 0.43 (Table 3.9). Models 2–5 indicated some evidence of support of model fit, with evidence ratios of 2.0 to 5.8. Once again, model averaging was applied to model set 1–5 (Table 3.10), which accounted for a combined 0.95 AIC weight. There was minimal evidence supporting models 6-9, which had a combined AIC weight of 0.05. When examining AIC weight sums for the covariates, UNIT and HTEMP accounted for an AIC weight of 0.95, so those were determined to have the greatest effect on movement probabilities (Table 3.10). WLEV was second in importance, with a sum of 0.75, followed by TL with a sum of 0.56, and last was SEX, with a sum of 0.10. The low AIC weight sum implied that sex had little effect on weekly movement probabilities. Lake Apopka and Duda showed the greatest variability in seasonal variation in movement probabilities among units (Figure 3.6). Alligator TL had a negative effect on the weekly movement models (Fig. 3.8), but air temperature (Fig. 3.7) and water level had a positive effect. Phase 1 was the only unit in which ingress was greater than egress (Fig. 3.6, 3.7 and 3.8). All equations and corresponding adjusted weights for model averaging of yearly and weekly egress and ingress movement probabilities can be found in Appendix D.

Home Range

Estimated mean home range size for juvenile alligator on all units was 56.8 ha, and ranged from 38.4–70.2 ha. Mean primary home range size was 31.5 ha, and ranged from 21.6–38.6 ha. Mean core home range size was 12.5 ha and ranged from 8.3–15.6 ha (Table 3.11). Alligators in Duda consistently had the smallest areas and alligators in the West Marsh consistently had the largest areas for core, primary and total home ranges. West Marsh and Lake Apopka alligators had the most variability in home range sizes for all home range classifications (Table 3.11 and Fig. 3.9). Male alligators exhibited a tighter pattern of home range size grouping for all home range classifications (Fig. 3.10), whereas female home range sizes were more dispersed over the size range. When all areas were combined, female alligators consistently had larger home range sizes than males ($P = 0.021 – 0.056$) (Table 3.11 and 3.12), and home range sizes of females varied more than males (Fig. 3.11). Larger ($P = 0.014 – 0.018$) home ranges were also found for alligators that had moved between units compared to alligators that had not moved (Table 3.11 and Fig. 3.12). Unit ($P = 0.136 – 0.147$) and TL ($P = 0.633 – 0.881$) had no significant effect on core home range sizes (Table 3.12).

Composite location maps of total and core home ranges of alligators show the extent of juvenile alligator movement and locations within the North Shore Restoration Area (Fig. 3.13–3.14). Phase 1 was the only site in which all radio-instrumented alligators stayed within the capture unit (Fig. 3.15-3.16). Alligators in the West Marsh had the second highest amount of egress from the original capture unit. The total home range shows the movement patterns of alligators (Fig. 3.17), while the core home range (Fig. 3.18) shows where alligators that moved finally settled. Some of the longest movements were: 1) alligator 150.335 moved 7.7 km from the West Marsh to Phase 1; 2) alligator 150.133 moved 3.8 km to just north of Duda; and 3) alligator 150.564 moved 2.0 km to the borrow pits just south of the Lake Apopka Field Station. Alligators in Duda also moved some of the greatest distances (Fig. 3.19). The core home range (Fig. 3.20) indicated that alligators that moved out of Duda usually returned. Of the alligators

that moved out of Duda, 150.513 moved 3.2 km to the marsh flow-way, 150.283 moved 3.4 km to Phase 1, and 150.713 moved across the southern levee of the west Duda pond and into Lake Apopka. Lake Apopka alligators moved the greatest distances of all units (Fig. 3.21). The core home range (Fig. 3.22) indicates that most Lake Apopka alligators moved into the North Shore Restoration Area and stayed, with the exception of 150.604. There was a net movement into the NSRA from Lake Apopka (Fig. 3.23). All individual home range maps for the alligators can be found in Appendix E.

DISCUSSION

Capture and Recapture

We had difficulty catching the desired sample size of alligators on Lake Apopka because water was often back in the swamp and alligators were usually in thick shrub or emergent vegetation. We also had difficulty to finding animals within the specified size range on Lake Apopka. The target sample size of alligators on Duda was also difficult to attain because of low water, thick vegetation, and sparse alligators of target sizes. The three locations within Duda that we could consistently find alligators were the two Duda detention ponds and the marsh in the north-central section. Although we were able to find alligators in the Duda marsh, the density was much lower than those in the West Marsh or Phase 1. It was relatively easy to capture alligators within the targeted size range in the West Marsh. Captures in the West Marsh were primarily made in cell H where the water was shallow and hydrilla was dense. Because most of cell G was open water, no juvenile alligators were captured there. Alligators were most easily caught in Phase 1 because density of juvenile alligators was relatively high and most alligators were easily accessible. Although we were unable to analyze gross movement patterns or growth rates due to low number of recaptures, an adequate number of marked alligators should be available in the NSRA and Lake Apopka for future investigations on gross movement patterns and growth rates.

Movement Probability Models

Alligators in Lake Apopka and Duda were the most likely to move in or out of those areas, and they exhibited the greatest variability in movements. Alligator movement probabilities in the West Marsh and Phase 1 were relatively stable with lower emigration probabilities. We hypothesize that the movement out of Lake Apopka could be a result of less suitable habitat, less food resources, and elevated predation pressure from larger alligators. The very small strip of emergent marsh along the levee on the north shore of Lake Apopka greatly reduced the amount of escape cover for juvenile alligators. We speculate that juvenile alligators on the north shore probably move around until they find suitable habitat that provides protection from larger alligators and has a desirable food supply. Movement out of Duda may be a result of sub-optimum habitat quality and frequent low water levels. The dense stands of cattail with scattered willow heads on Duda may be less suitable for adult and juvenile alligators due to the lack of open water, which reduces mobility and feeding opportunities. Duda also had the shallowest water during the study period, which we think resulted in higher water temperatures and resulting lower prey abundance.

We documented a net influx of alligators into Phase 1, with no emigration during our study period. We suspect that emigration might increase if adjacent impoundments are flooded.

We documented a gradual increase in the average size of alligators in Phase 1 during the study, which suggests water levels and prey availability are becoming more desirable for larger alligators. If this trend continues, we would expect less immigration between Phase 1 and surrounding impoundments. The importance of study unit in movement probabilities, relative to other variables such as temperature, and water level suggests that habitat differences are important in retaining alligators within an area. Possible unit specific variables that could affect movement are habitat structure, food availability, predation risk, size distributions, competition, and other environment or social interactions. In summary, our telemetry investigations indicate that alligators are most sedentary in the West Marsh, probably because it has had an extended period of relatively stable water levels, desirable water depths, a mixture of habitat types, and rich substrate for producing alligator prey. Therefore, OCP levels from these alligators would be expected to most accurately represent sediment concentrations. We documented a net migration of alligators from Lake Apopka into the NSRA, suggesting that they are searching for improved habitat, finding it, and remaining. As expected, alligators from Lake Apopka tended to move to the closest impoundment to their original capture location on the lake. Alligators in Duda showed a considerable amount of variability in site fidelity and origin, and our findings indicate they probably had fed in multiple areas. Alligators in Phase 1 represent a mixture of origins and varied residence periods; thus, it is unlikely their OCP levels represent OCP availability from that marsh at this time. However, as time progresses, OCP levels in Phase 1 alligators can be expected to be more representative of that area.

Body condition analysis provided some insight on possible drivers for juvenile alligator movements. Lake Apopka alligators had lower body condition than the other units within the NSRA. This may indicate food availability is greater in NSRA units. Lake Apopka has a narrow band of emergent vegetation around the perimeter of the north shore, which is likely critical foraging habitat and cover for juvenile alligator. Lake Apopka might have adequate juvenile alligator prey sources in open water but foraging there is likely to have an elevated risk of cannibalism with the high density of adult alligators in that habitat. We speculate that juvenile alligators from Lake Apopka moved into the NSRA to search for more suitable foraging habitats with less predation risk. Duda, Phase 1, and the West Marsh all have greater habitat diversity, patchiness, and structure within their respective marshes when compared to the lake. Under conditions of suitable water availability, the diversity of NSRA wetlands could contribute to the net influx of juvenile alligators from the lake. Alligators in newly flooded Phase 2 had a higher body condition than other study units. Although the sample size was small (n = 5), it still provides an indication that food resources and foraging habitat may be better for juvenile alligators in newly flooded wetlands. We speculate that food resources are more abundant within the newly flooded, although no data were collected to support this hypothesis.

Home Range

All home range size estimates were considerably smaller than the size of study units. Although there were no significant differences in home range size among units, alligators in Duda tended to have smaller home range sizes. The Duda unit seemed to have less suitable juvenile alligator habitat than did the other NSRA units. Marsh in the Duda unit was very dense with little open water when compared to the other units. Habitat structure of Duda might have limited juvenile alligator home ranges. We also found that females had larger home ranges than males. A good proportion of males exhibited a multiple-core home range, whereas females usually had one

large core area. This concurs with findings in Louisiana where almost half (46%) of juvenile male alligators exhibited two or more widely separated centers of activity within a larger overall home range complex, whereas only 27% of females showed definite multiple temporary range centers (McNease and Joanen 1974). Some alligators, both male and female, exhibited exploratory tendencies, which indicates that we should focus on core home range rather than total home range. Burt (1943), defined home range as the area traversed by the individual in its normal activities of food gathering, mating, and caring for young, and that occasional sallies outside the area, perhaps exploratory in nature, should not be considered part of the home range. In the case of alligators on the NSRA and Lake Apopka, core home range estimates represent the area that juvenile alligators are most likely to do the majority of foraging activities and, therefore, body burdens of OCPs would reflect OCP availability in that area. Daytime and nighttime home ranges were visually examined and no discernable differences were detected.

Table 3.1. Sample size (n), mean body condition, and significant difference (P-value) matrix of body condition among study units in Lake Apopka and the North Shore Restoration Area for two size classes of alligators during 2008-09. Areas are Lake Apopka (LA), Duda (DU), Phase 1 (P1), Phase 2 (P2), and West Marsh (WM).

					Area P-values				
Size class	**Area**	***n***	$\bar{x}$	**SE**	**Duda**	**Lake**	**Phase1**	**Phase2**	**West Marsh**
61-91 cm	DU	14	2.148	0.059	.				
	LA	36	1.993	0.032	0.059	.			
	P1	61	2.337	0.036	0.015	<0.001	.		
	WM	13	2.316	0.090	0.095	<0.001	0.786	.	
91-122 cm	DU	19	2.229	0.054	.				
	LA	20	2.073	0.046	0.041	.			
	P1	93	2.270	0.025	0.497	<0.001	.		
	P2	5	2.725	0.110	<0.001	<0.001	<0.001	.	
	WM	34	2.328	0.041	0.145	<0.001	0.218	<0.001	.

Table 3.2. Yearly movement probability models of egress of radio-instrumented alligators from study units in Lake Apopka and the North Shore Restoration Area during 2008-2009.

Model	Model parameters	AIC	ΔAIC	AIC weight	-logLik	Deviance	Evidence ratio
1.	(UNIT + SEX + TL)	60.34	0.00	0.50	-24.17	48.34	1.0
2.	(UNIT + SEX)	61.02	0.68	0.36	-25.51	51.02	1.4
3.	(UNIT * SEX + TL)	64.69	4.35	0.06	-23.34	46.69	8.8
4.	(UNIT + TL)	65.03	4.69	0.05	-27.52	55.03	10.5
5.	(UNIT)	65.33	4.99	0.04	-28.67	57.33	12.2
6.	(SEX)	92.40	32.07	0.00	-44.20	88.40	9,201,427.0
7.	(TL)	93.77	33.43	0.00	-44.88	89.77	18,189,757.0
8.	(TL + SEX)	94.11	33.77	0.00	-44.06	88.11	21,614,376.0

Table 3.3. Yearly movement probability models of ingress of radio-instrumented alligators to study units within Lake Apopka and the North Shore Restoration Area during 2008-2009.

Model	Model parameters	AIC	ΔAIC	AIC weight	-logLik	Deviance	Evidence ratio
1.	(UNIT + SEX)	52.99	0.0	0.47	-19.49	38.99	1.0
2.	(UNIT + SEX + TL)	53.69	0.70	0.33	-18.85	37.69	1.4
3,	(UNIT + TL)	55.74	2.75	0.12	-20.87	41.74	4.0
4,	(UNIT)	56.78	3.79	0.07	-22.39	44.78	6.6
5.	(UNIT * SEX + TL)	61.21	8.22	0.01	-17.61	35.21	60.9
6.	(SEX)	92.40	39.41	0.00	-44.20	88.40	361,410,233.0
7.	(TL)	93.77	40.78	0.00	-44.88	89.77	714,450,484.0
8.	(TL + SEX)	94.11	41.12	0.00	-44.06	88.11	848,961,378.0

Table 3.4. Beta parameters for yearly probabilities of egress and ingress among Lake Apopka and the North Shore Restoration Area units during 2008-2009.

	Ingress				Egress	
Beta parameters	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 1**	**Model 2**
Intercept	-2.7139	2.0136	4.8341	-1.0986	4.0341	-1.8032
UnitLA	-0.0242	0.2018	-0.2743	-0.5108	2.6913	2.2233
UnitO	22.2260	22.2295	20.7603	20.6647		
UnitP2	23.0670	23.2550	21.3972	20.6647		
UnitP1	-0.4498	-0.3604	-0.3996	-0.3830	-19.0204	-19.0433
UnitWM	-19.1819	-19.1758	-18.5975	-18.4675	-1.4953	-1.3060
Total Length (cm) = TL		-0.0439	-0.0573		-0.0564	
Sex Male = SEXM	2.2420	2.0129			2.0055	1.8788

Table 3.5. Probabilities of egress from a unit for juvenile male and female alligators in Lake Apopka and North Shore Restoration Area units during 2008-2009.

		Unit			
Sex	**Total length (cm)**	**Lake Apopka**	**Duda**	**Phase 1**	**West Marsh**
Male	90	0.95	0.64	0.00	0.31
	100	0.94	0.56	0.00	0.24
	110	0.92	0.48	0.00	0.19
	120	0.89	0.41	0.00	0.15
	130	0.85	0.34	0.00	0.13
	140	0.79	0.30	0.00	0.11
	150	0.71	0.27	0.00	0.11
Female	90	0.74	0.21	0.00	0.06
	100	0.69	0.16	0.00	0.04
	110	0.62	0.12	0.00	0.03
	120	0.54	0.09	0.00	0.03
	130	0.46	0.08	0.00	0.02
	140	0.39	0.07	0.00	0.02
	150	0.34	0.07	0.00	0.02

Table 3.6. Probabilities of ingress to a unit for juvenile male and female alligators in Lake Apopka and North Shore Restoration Area units during 2008-2009.

		Unit			
Sex	**Total length (cm)**	**Lake Apopka**	**Duda**	**Phase 1**	**West Marsh**
Male	90	0.42	0.42	0.33	0.00
	100	0.37	0.37	0.28	0.00
	110	0.32	0.32	0.24	0.00
	120	0.29	0.29	0.21	0.00
	130	0.26	0.26	0.19	0.00
	140	0.24	0.24	0.18	0.00
	150	0.22	0.22	0.17	0.00
Female	90	0.13	0.14	0.10	0.00
	100	0.10	0.11	0.08	0.00
	110	0.08	0.09	0.06	0.00
	120	0.07	0.07	0.05	0.00
	130	0.06	0.06	0.04	0.00
	140	0.05	0.06	0.04	0.00
	150	0.05	0.05	0.04	0.00

Table 3.7. Weekly movement probability models of juvenile alligator egress from Lake Apopka and the North Shore Restoration Area units during 2008-2009.

Model	Model parameters	AIC	ΔAIC	AIC weight	-logLik	Deviance	Evidence ratio
1.	(HTEMP + UNIT + TL + (1 | tag))	440.2	0.0	0.39	-212.1	424.2	1.0
2.	(HTEMP + UNIT + (1 | tag))	440.9	0.7	0.28	-213.4	426.9	1.4
3.	(HTEMP + TL + WLEV + UNIT + (1 | tag))	442.0	1.8	0.16	-212.0	424.0	2.4
4.	(HTEMP + WLEV + UNIT + (1 | tag))	442.7	2.5	0.11	-213.4	426.7	3.5
5.	(HTEMP + SEX + WLEV + UNIT + (1 | tag))	444.3	4.1	0.05	-213.1	426.3	7.7
6.	(SEA + UNIT + (1 | tag))	449.6	9.4	0.00	-215.8	431.6	109.1
7.	(SEA + WLEV + UNIT + (1 | tag))	451.0	10.8	0.00	-215.5	431.0	219.7
8.	(WLEV + UNIT + (1 | tag))	451.3	11.1	0.00	-218.6	437.3	255.2
9.	(HTEMP + WLEV + (1 | tag))	474.1	33.9	0.00	-233.0	466.1	22,796,736.0
10.	(HTEMP + WLEV + SEX +TL+ (1 | tag))	474.7	34.5	0.00	-231.4	462.7	30,772,375.0
11.	(HTEMP + WLEV + SEX + (1 | tag))	476.0	35.8	0.00	-233.0	466.0	58,945,741.0

Table 3.8. Beta parameters for weekly movement probability models of juvenile alligator egress from Lake Apopka and the North Shore Restoration Area unit during 2008-2009.

Beta parameters	Model selection					AIC weight sum	Parameter rank
	Model 1	Model 2	Model 3	Model 4	Model 5		
Intercept	-2.4378	-6.0388	-7.5383	-11.0091	-11.5701		
UnitLA	0.9680	0.9023	0.7908	0.7304	0.7556	1.0	1
UnitP2	-1.7207	-1.9515	-1.6630	-1.8989	-1.8046	1.0	1
UnitP1	-2.7951	-3.0091	-2.8611	-3.0737	-3.0840	1.0	1
UnitWM	-1.1046	-1.0359	-1.3605	-1.2839	-1.2524	1.0	1
Air Temperature (HTEMP)	0.1004	0.1013	0.1003	0.1012	0.1029	1.0	1
Water level (WLEV)			0.0829	0.0805	0.0859	0.32	3
Total Length (TL)	-0.0337		-0.0339			0.55	2
Sex Male (SEXM)					0.3293	0.05	4

Table 3.9. Weekly movement probability models of juvenile alligator ingress to Lake Apopka and North Shore Restoration Area units during 2008-2009.

Model	Model parameters	AIC	ΔAIC	AIC weight	-logLik	Deviance	Evidence ratio
1.	(HTEMP + TL + WLEV + UNIT + (1 | tag))	420.1	0.0	0.43	-201.1	402.1	1.0
2.	(HTEMP + WLEV + UNIT + (1 | tag))	421.5	1.4	0.22	-202.8	405.5	2.0
3.	(HTEMP + UNIT + TL + (1 | tag))	422.5	2.4	0.13	-203.2	406.5	3.3
4.	(HTEMP + SEX + WLEV + UNIT + (1 | tag))	423.1	3.0	0.10	-202.6	405.1	4.5
5.	(HTEMP + UNIT + (1 | tag))	423.6	3.5	0.08	-204.8	409.6	5.8
6.	(HTEMP + WLEV + (1 | tag))	426.0	5.9	0.02	-209.0	418.0	19.1
7.	(HTEMP + WLEV + SEX + TL + (1 | tag))	427.9	7.8	0.01	-207.9	415.9	49.4
8.	(HTEMP + SEX + WLEV + (1 | tag))	428.0	7.9	0.01	-209.0	418.0	51.9
9.	(WLEV + UNIT + (1 | tag))	428.7	8.6	0.01	-207.3	414.7	73.7
10.	(SEA + WLEV + UNIT + (1 | tag))	430.6	10.5	0.00	-205.3	410.6	190.6
11.	(SEA + UNIT + (1 | tag))	436.8	16.7	0.00	-209.4	418.8	4,230.2

Table 3.10. Beta parameters, AIC weight sums, and parameter ranks for weekly probabilities of ingress of juvenile alligators for Lake Apopka and North Shore Restoration Area units during 2008-2009.

Beta parameters	Model selection					AIC weight sum	Parameter rank
	Model 1	Model 2	Model 3	Model 4	Model 5		
Intercept	-33.5246	-37.0825	-3.1062	-37.5950	-7.3542		
UnitLA	-0.8822	-0.9124	0.0758	-0.8918	0.0303	0.95	1
UnitP2	2.3674	2.1603	1.8153	2.2509	1.6353	0.95	1
UnitP1	-0.9590	-1.1223	-0.6519	-1.1408	-0.8102	0.95	1
UnitWM	-2.1894	-2.0380	-0.8003	-1.9930	-0.6743	0.95	1
Air Temperature (HTEMP)	0.1019	0.1026	0.1136	0.1042	0.1141	0.95	1
Water level (WLEV)	0.4979	0.4854		0.4902		0.75	2
Total Length (TL)	-0.0401		-0.0394			0.56	3
Sex Male (SEXM)				0.3283		0.10	4

Table 3.11. Estimated home range size for juvenile alligators on Lake Apopka and North Shore Restoration Area units in 2008-09.

		Mean home range size (ha)					
	n	**50% Core**	**SE**	**80% Primary**	**SE**	**95% Total**	**SE**
Unit							
Duda	11	8.3	3.2	21.6	7.4	38.4	12.1
Lake Apopka	11	13.4	3.8	34.7	9.8	62.3	18.2
Phase 1	15	11.4	2.4	29.0	5.5	52.0	9.7
West Marsh	16	15.6	4.1	38.6	9.2	70.2	16.3
Sex							
Female	24	15.5	3.2	37.4	7.3	66.4	12.9
Male	29	9.9	1.6	26.7	4.2	48.8	7.6
Moved							
No	38	10.9	2.1	27.7	4.7	50.2	8.3
Yes	15	16.5	3.2	41.3	8.0	73.6	14.3
Total	53	12.5	1.7	31.5	4.1	56.8	7.2

Table 3.12. ANCOVA results of home range analysis of juvenile alligators with effects of study area (Unit), Sex, moved from capture unit (Moved), and alligator total length (TL) in Lake Apopka and the North Shore Restoration Area, 2008-2009.

	Home range (*P*-values)		
Effect	**Core 50%**	**Primary 80%**	**Total 95%**
Unit	0.147	0.142	0.136
Sex	0.021	0.041	0.056
Moved	0.018	0.014	0.017
TL	0.881	0.732	0.633

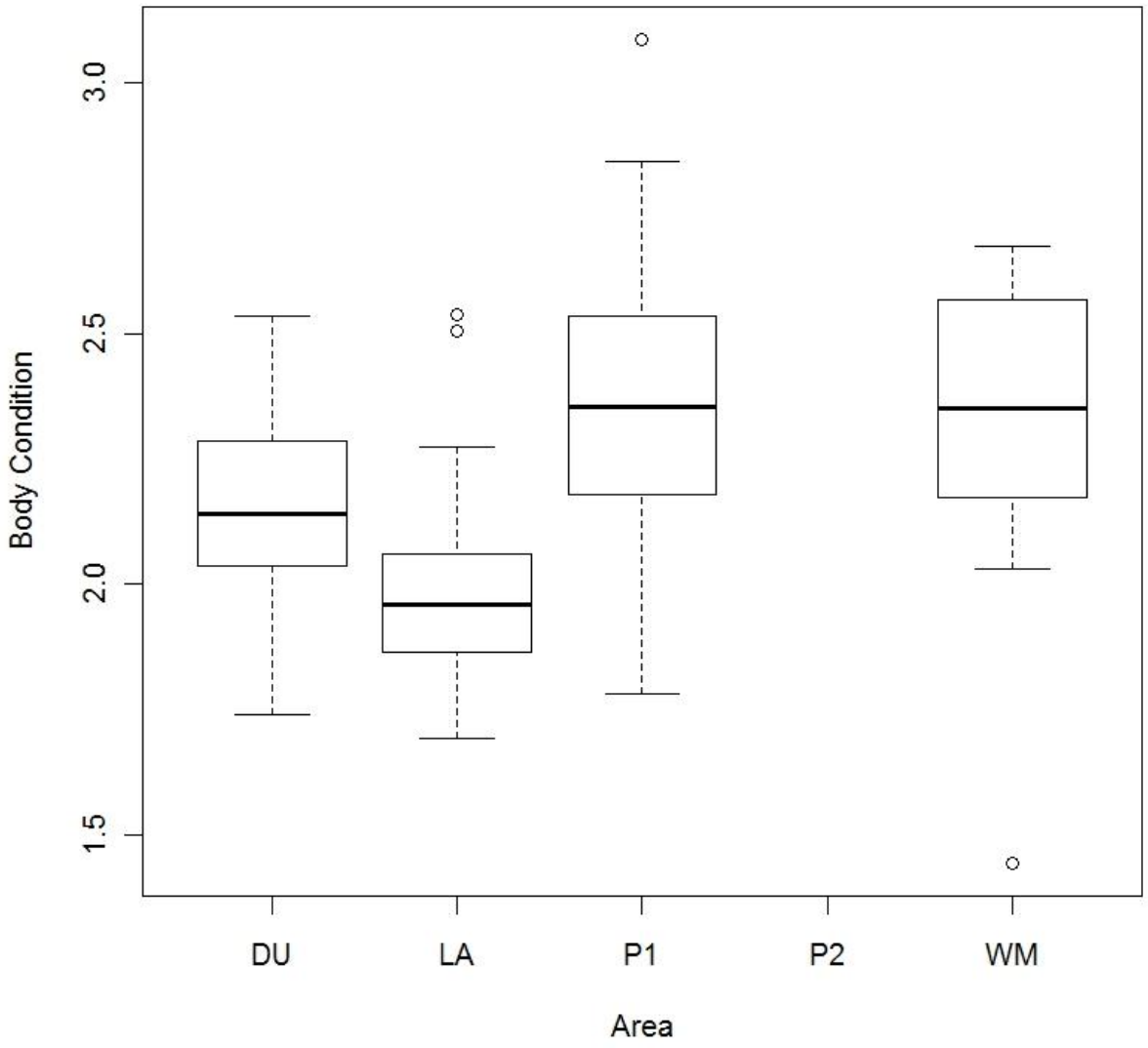

Figure 3.1. Body condition (Fulton's K) for 61-90-cm alligators in Duda (DU, n = 14), Lake Apopka (LA, n = 36), Phase 1 (P1, n = 61), and West Marsh (WM, n = 13) study areas. Differences ($P < 0.001$) were found between Lake Apopka and the NSRA units (Phase 1 and West Marsh). Some indication of differences were found between Lake Apopka and Duda ($P = 0.059$).

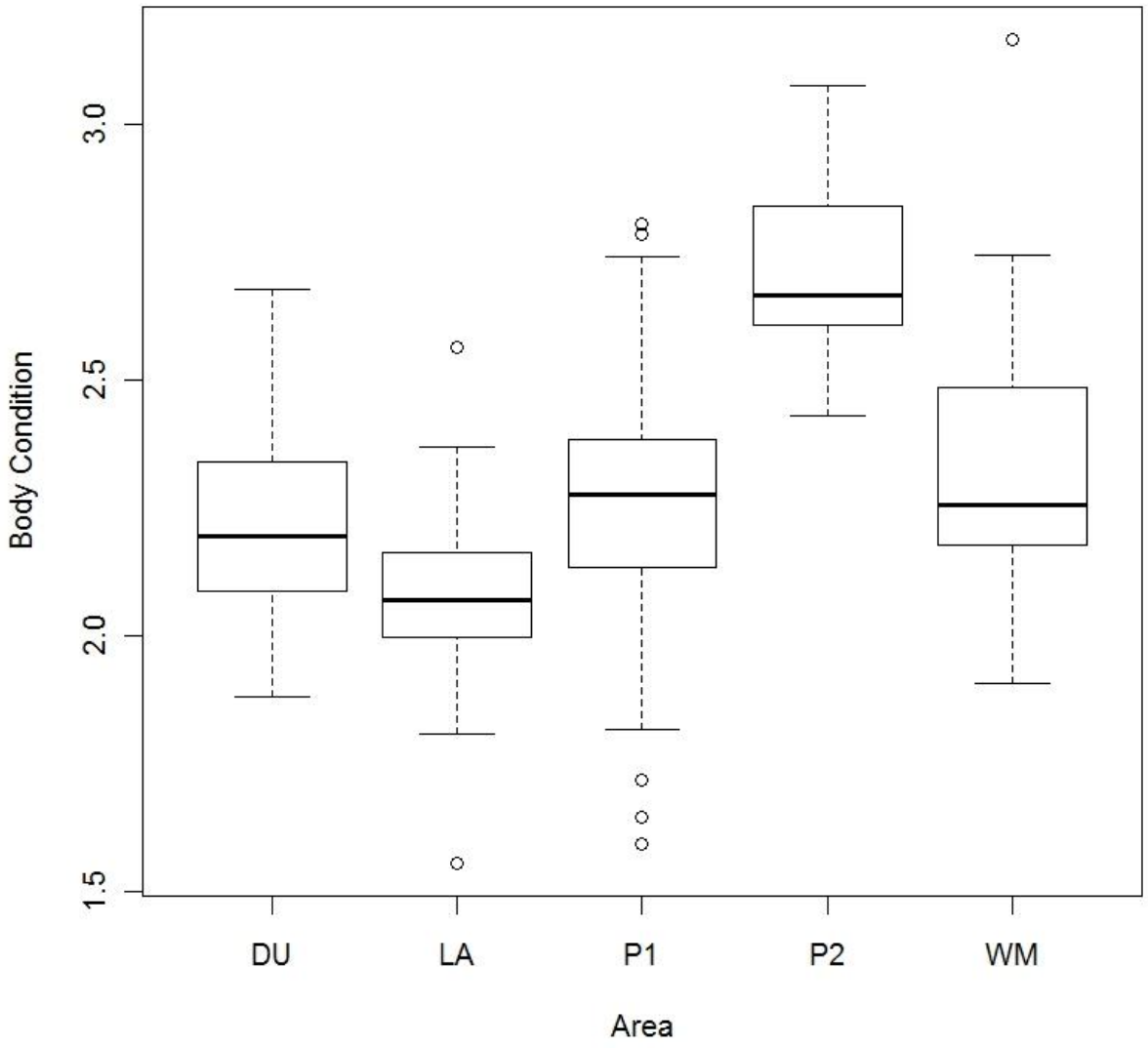

Figure 3.2. Body condition (Fulton's K) for 91-122-cm alligators in Duda (DU, n = 19), Lake Apopka (LA, n = 20), Phase 1 (P1, n = 93), Phase 2 (P2, n = 5), and West Marsh (WM, n = 34) study areas. Differences were found ($P < 0.05$) between Lake Apopka and the NSRA units. Phase 2 had significantly higher ($P < 0.001$) condition compared to all units.

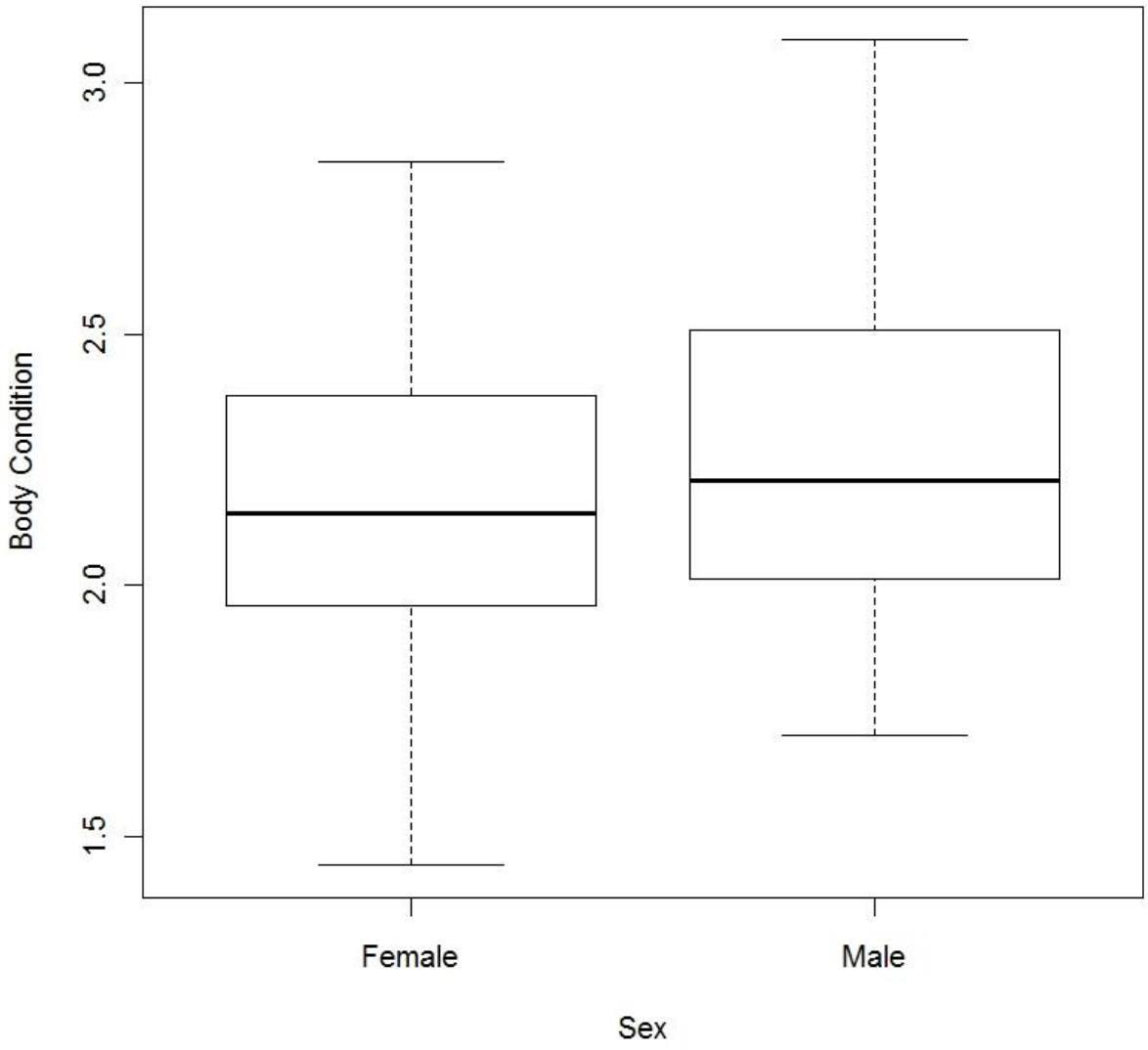

Figure 3.3. Body condition for 61-90-cm female (n = 51) and male (n = 80) alligators in Lake Apopka and North Shore Restoration Area units during 2008-2009. No significant difference (P > 0.05) was found.

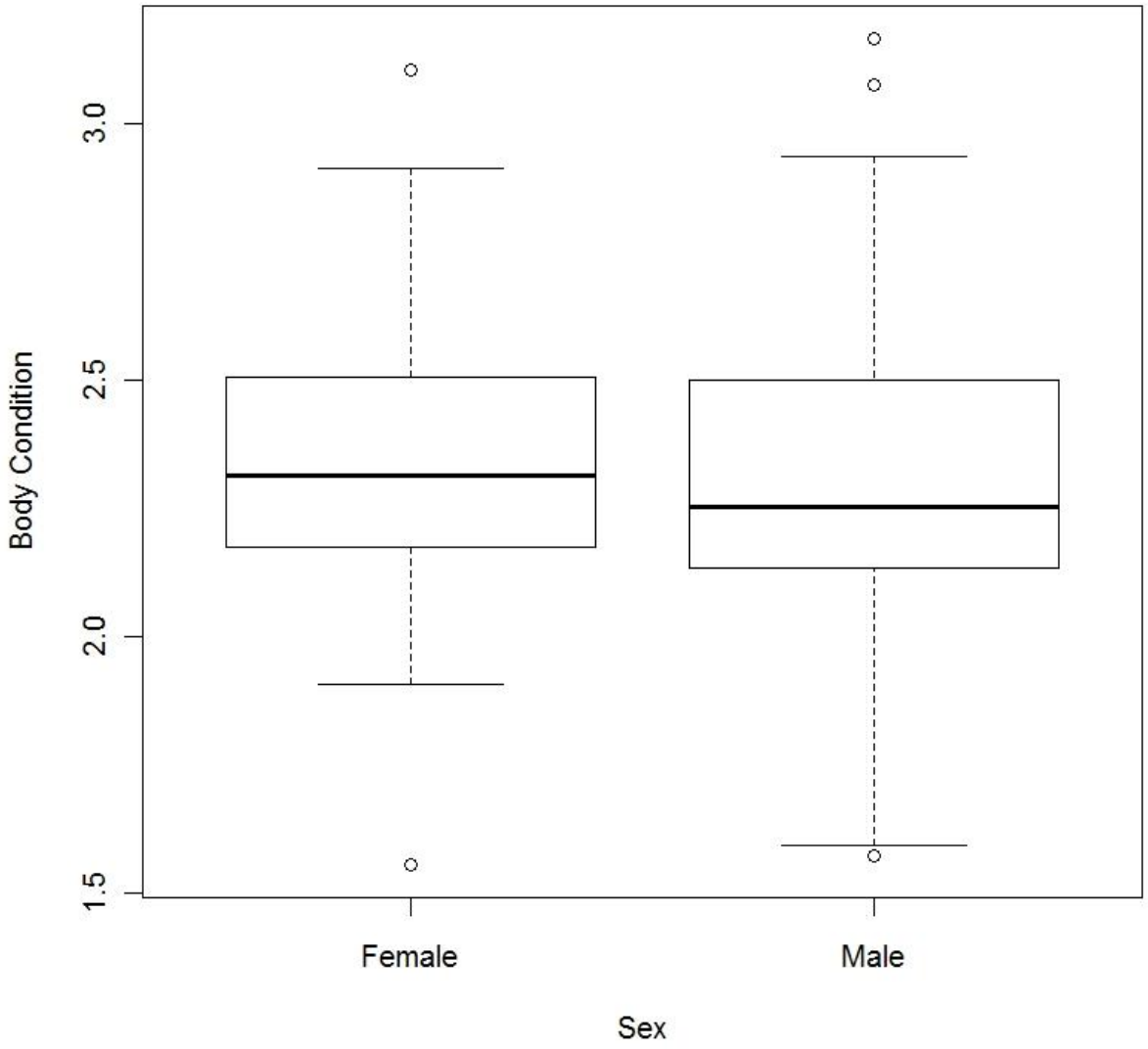

Figure 3.4. Box plot of body condition (Fulton's K) for 91-122 cm female (n = 90) and male (n = 101) alligators in Lake Apopka and North Shore Restoration Area units during 2008-2009. No significant difference (P > 0.05) was found.

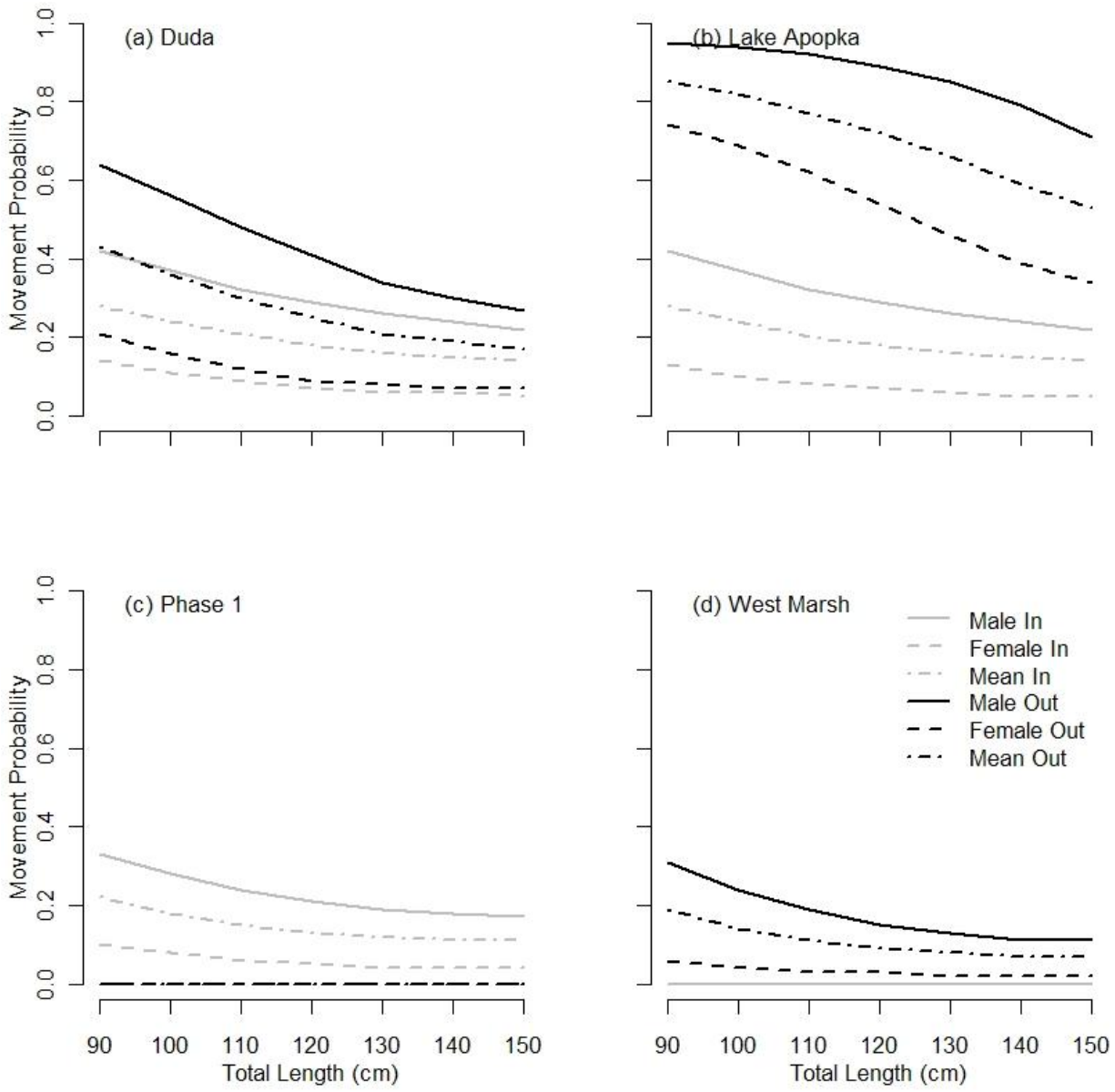

Figure 3.5. The effect of alligator total length on yearly movement probabilities of juvenile (91-150-cm) alligators in Lake Apopka and North Shore Restoration Area units during 2008-2009.

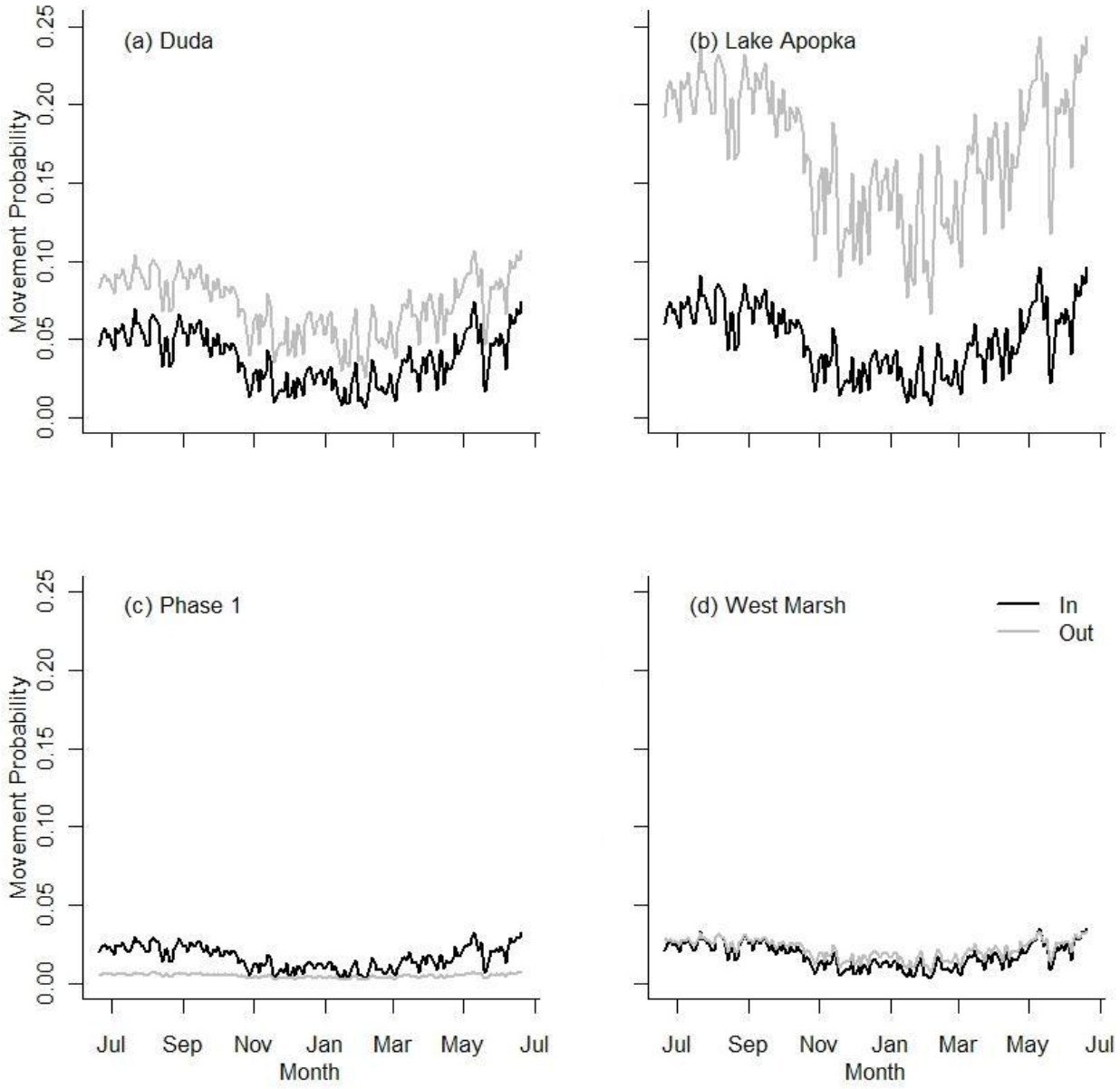

Figure 3.6. Seasonal variation in movement probabilities of juvenile alligators among Lake Apopka and North Shore Restoration Area units. High air temperatures were fixed at daily values from June 2008-July 2009. Total length was fixed at 90 cm and water levels were fixed at mean unit water level from June 2008-July 2009.

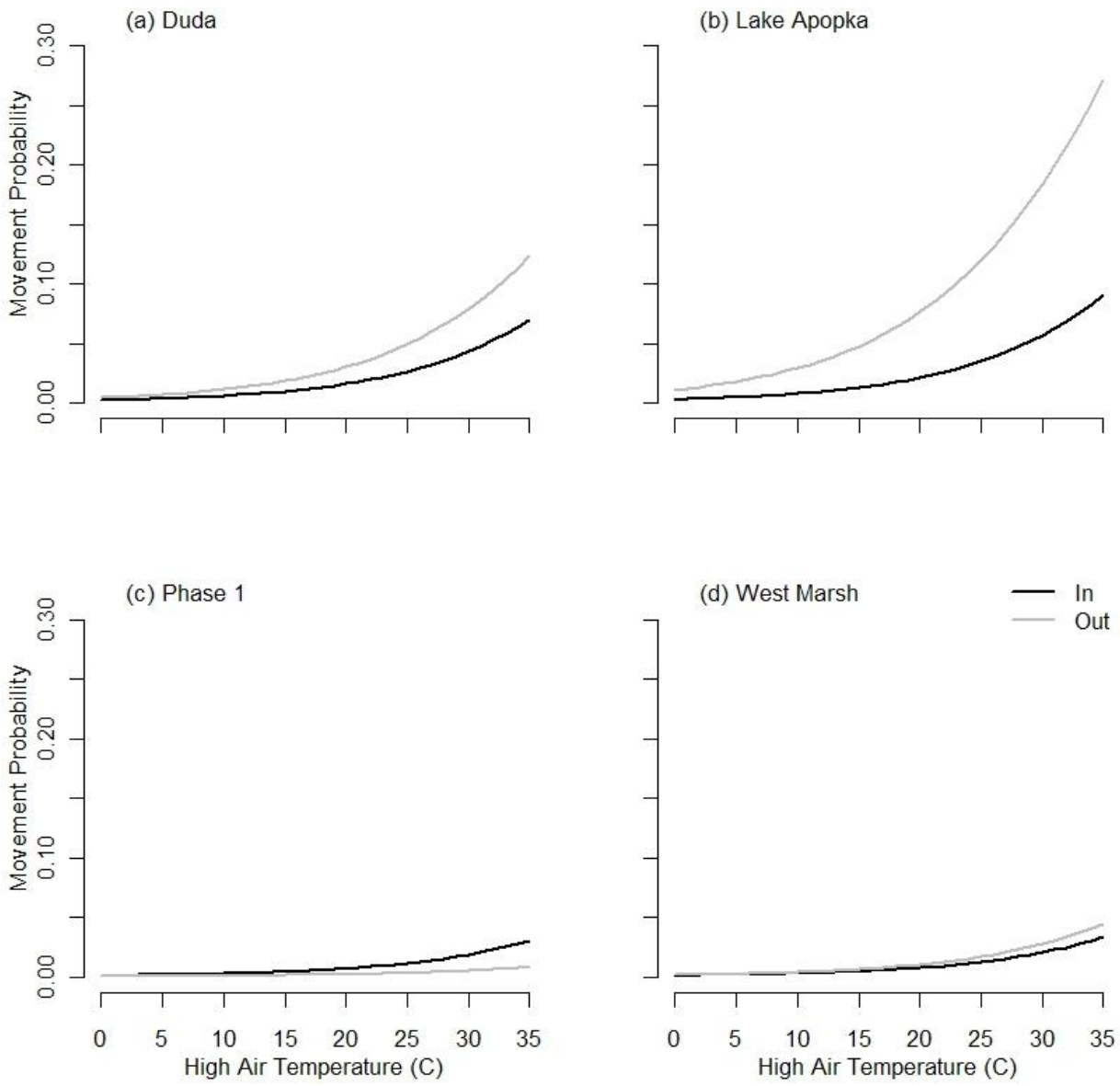

Figure 3.7. The effect of mean daily high temperature on weekly ingress and egress movement probabilities of juvenile alligators for Lake Apopka and North Shore Restoration Area units. Total length was fixed at 90 cm and water levels were fixed at annual mean unit water levels.

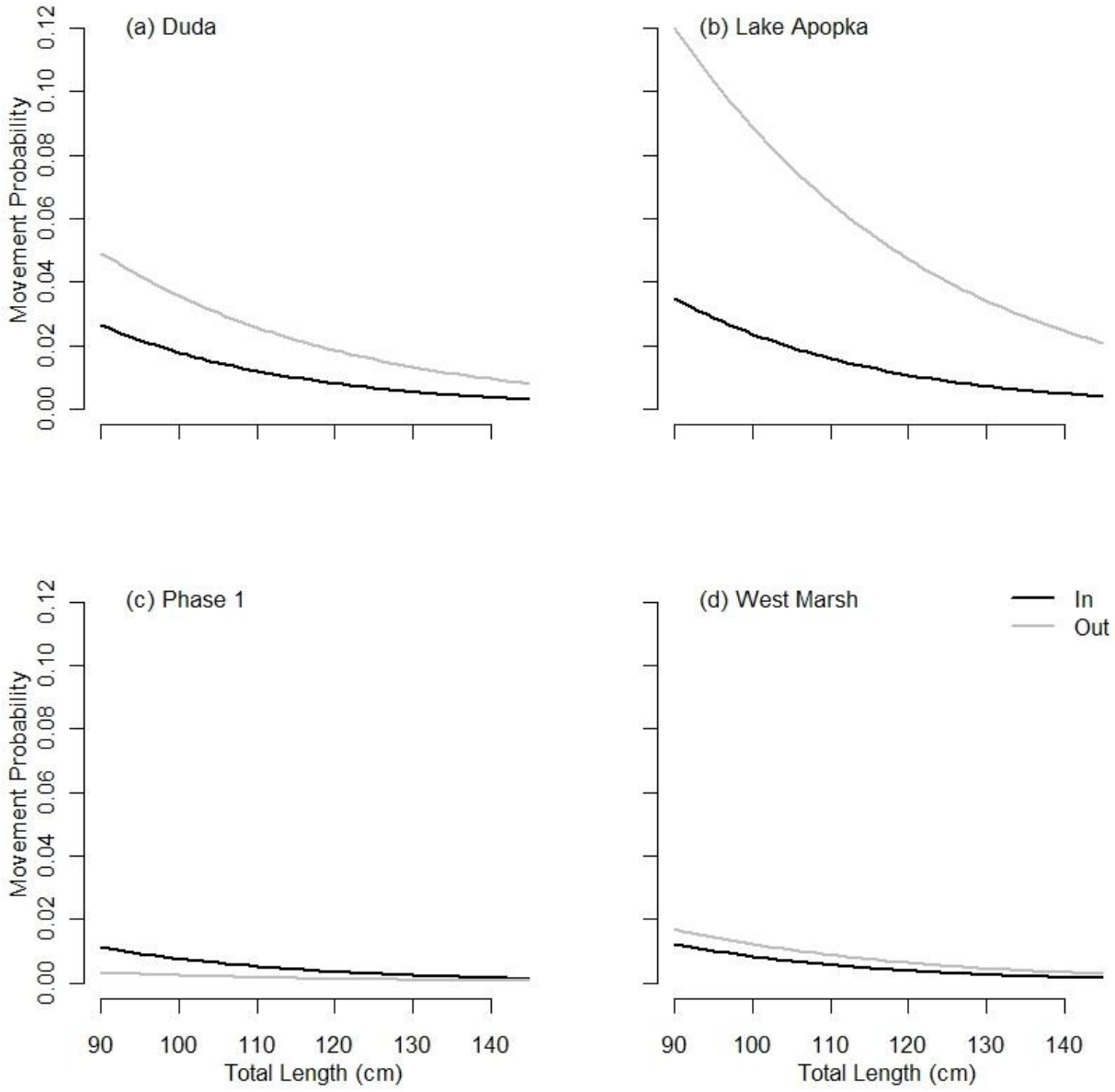

Figure 3.8. The effect of alligator total length on weekly ingress and egress movement probabilities of juvenile alligators for Lake Apopka and North Shore Restoration Area units. Air Temperature was fixed at 25˚ C and water levels were fixed at annual mean unit water levels.

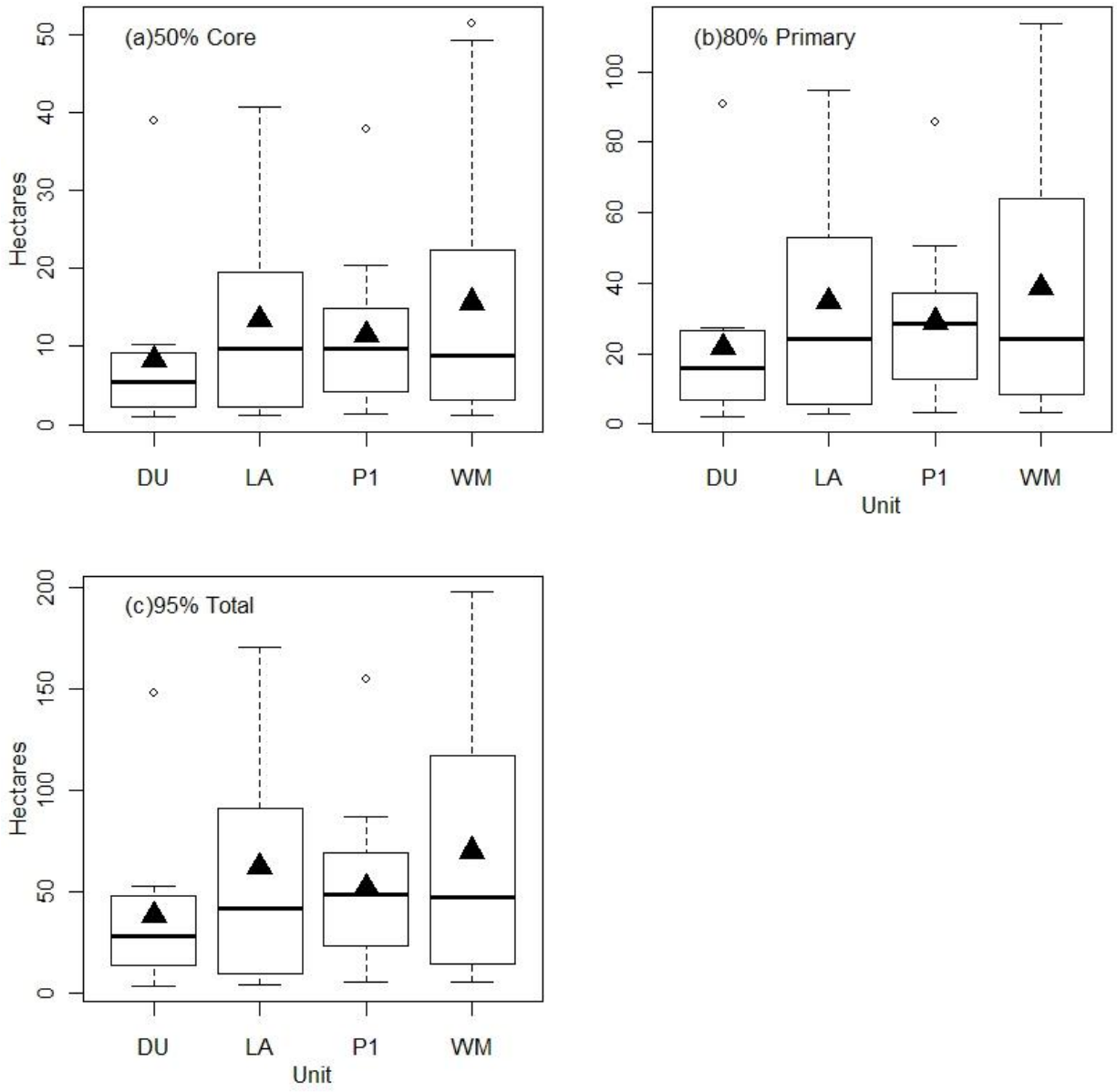

Figure 3.9. Box plots showing home range sizes by unit for juvenile alligator in Lake Apopka and North Shore Restoration Area units during 2008-09. Mean home range is represented by a triangle.

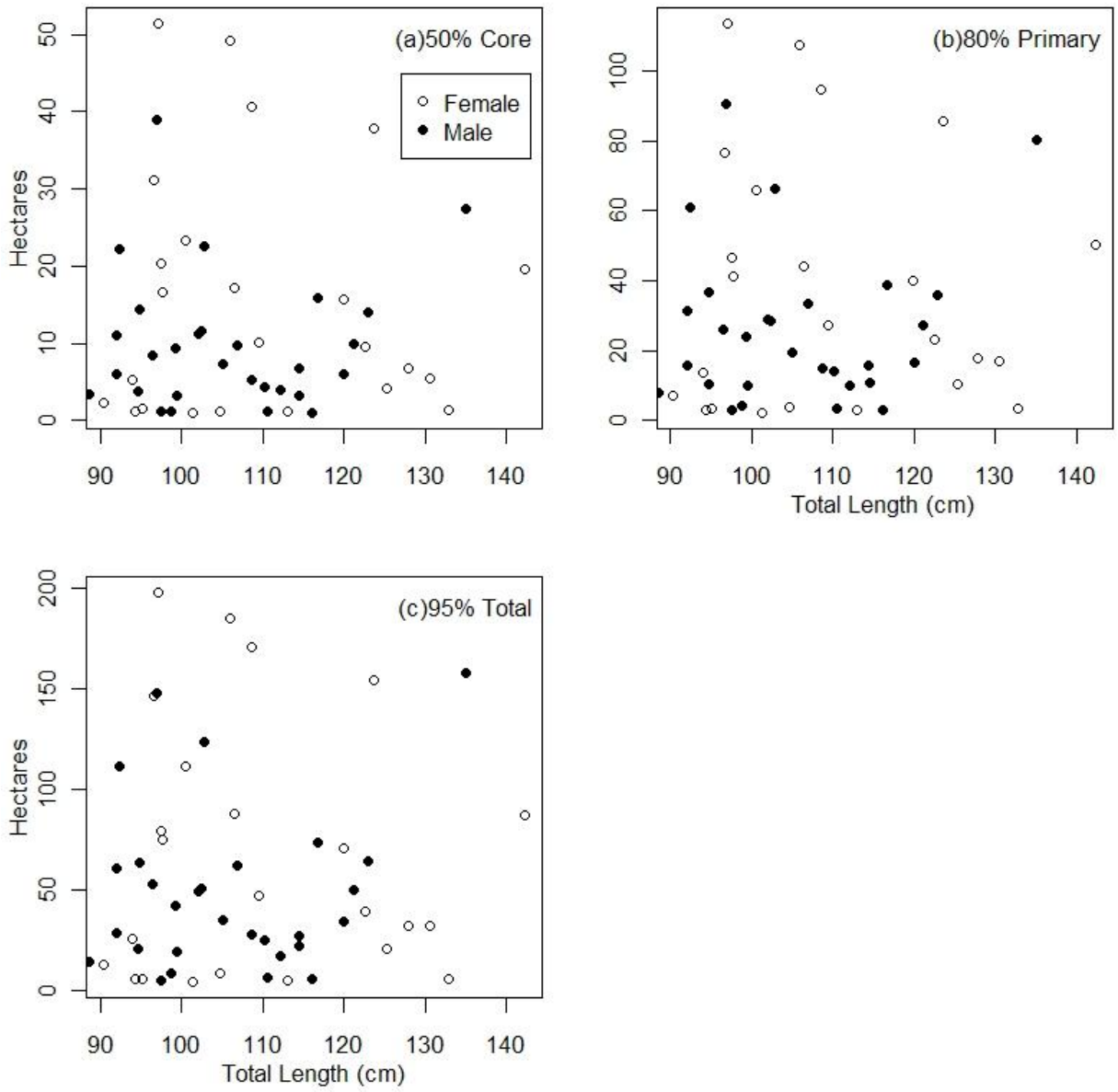

Figure 3.10. Scatter plot of home range sizes and total length for radio-instrumented individual male and female alligators in Lake Apopka and the North Shore Restoration Area during 2008-09.

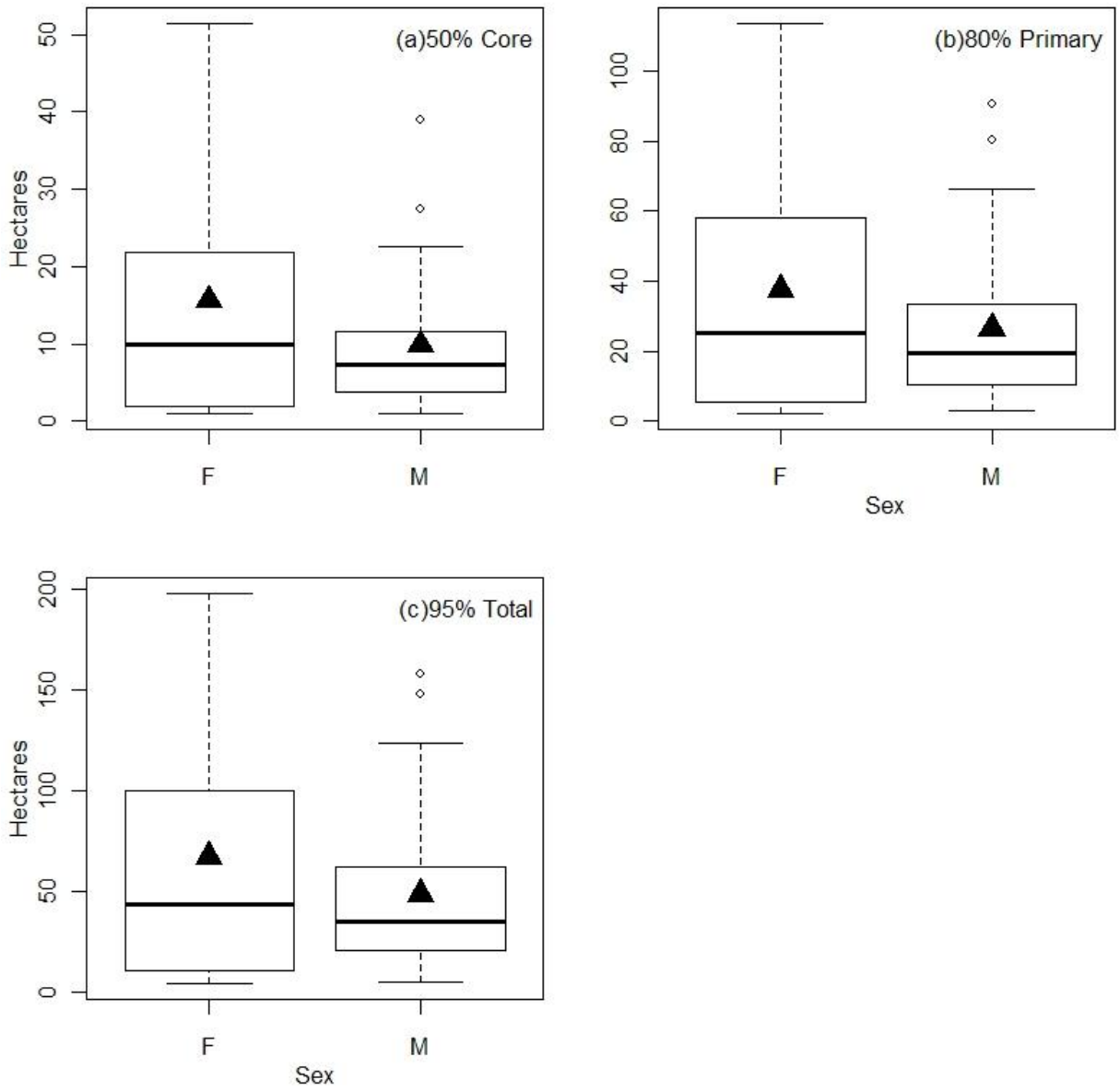

Figure 3.11. Box plots of home range sizes for radio-instrumented male and female alligators in Lake Apopka and the North Shore Restoration Area during 2008-09. Mean home range is represented by a triangle. Female home ranges were significantly larger for core (P = 0.021) and primary (P = 0.41).

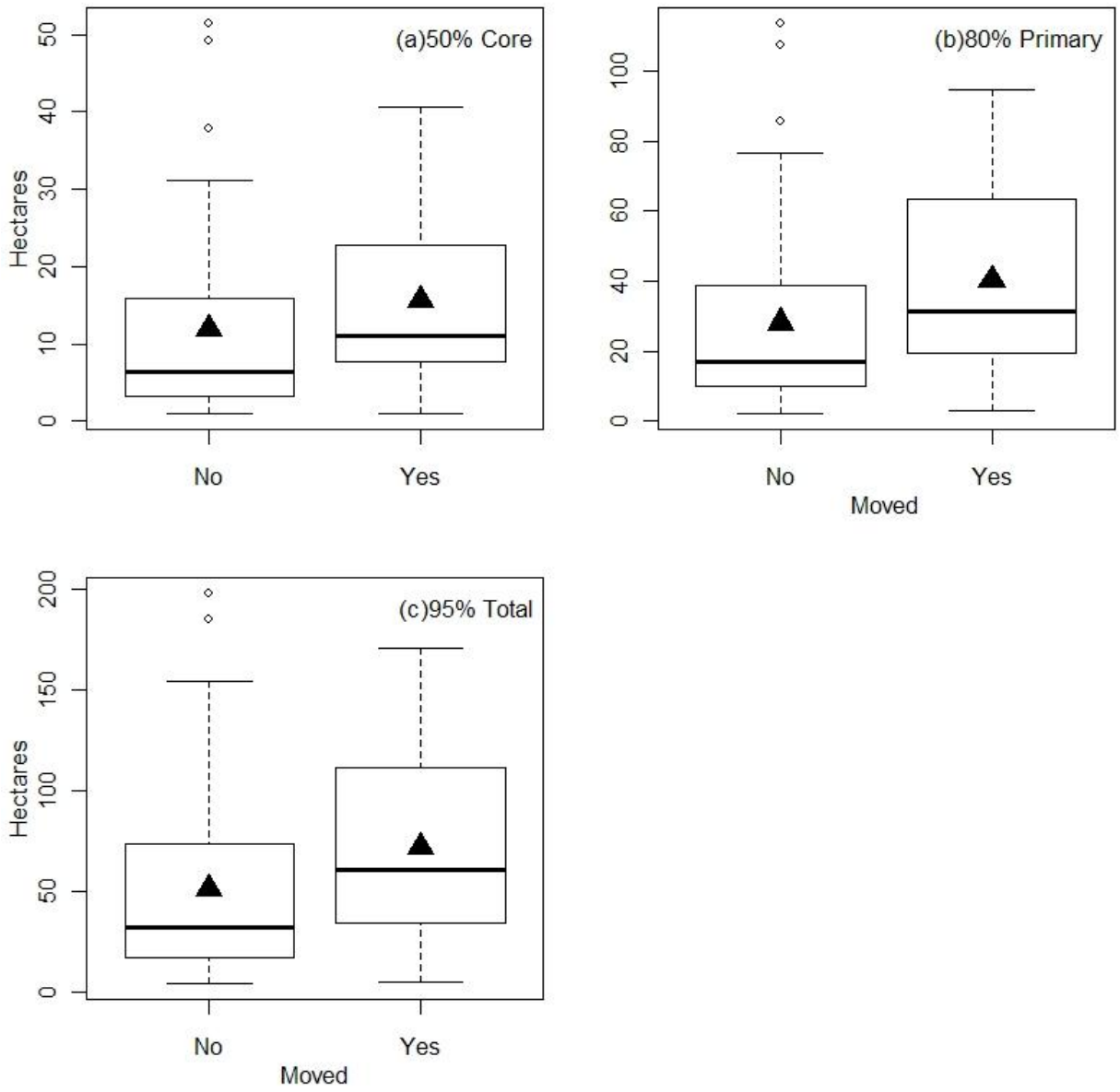

Figure 3.12. Box plots of home range sizes for juvenile alligators that changed units and alligators that did not change units in Lake Apopka and the North Shore Restoration Area during 2008-09. Mean home range is represented by a triangle. Alligators that moved units had significantly larger home range for all classes (P = 0.14 - 0.17).

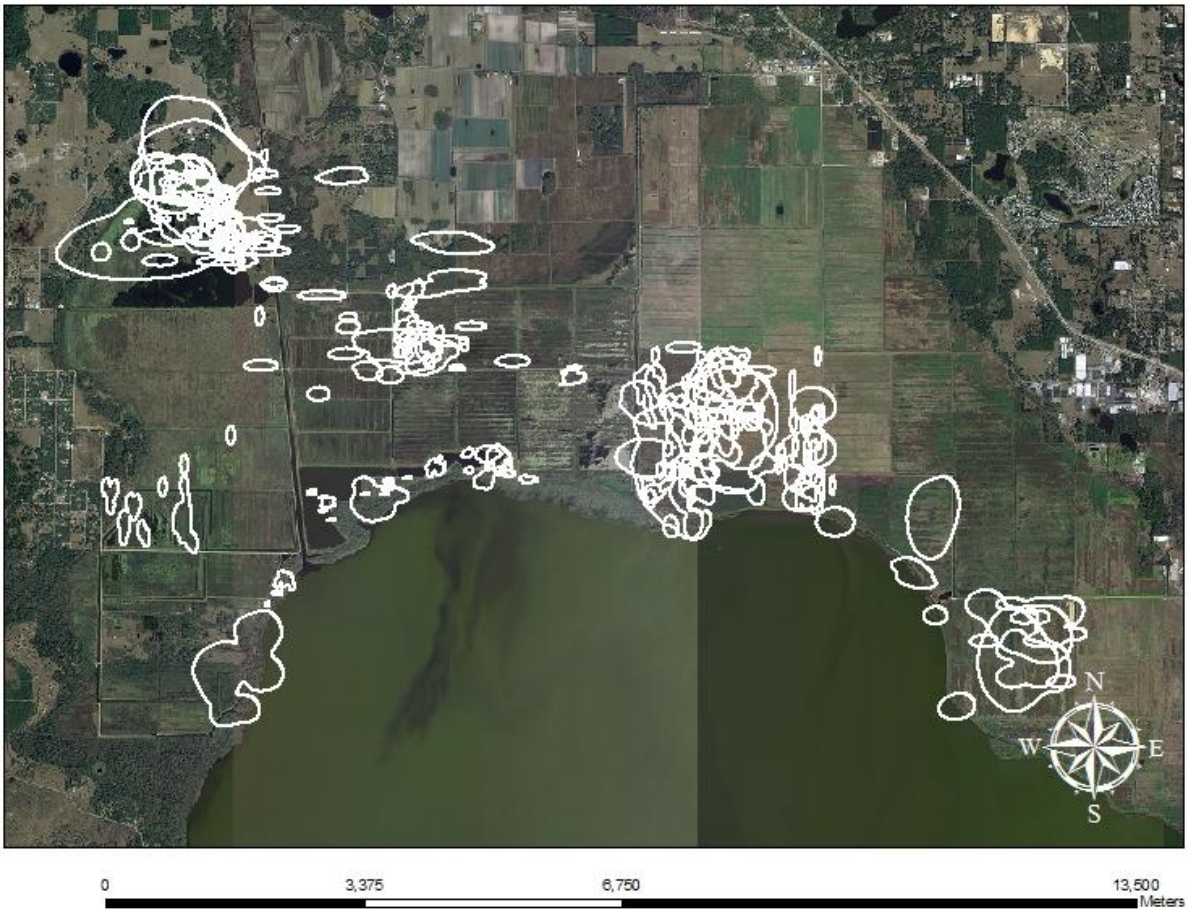

Figure 3.13. Composite of all juvenile alligator (n = 53) total home range sizes in Lake Apopka and the North Shore Restoration Area during 2008-09.

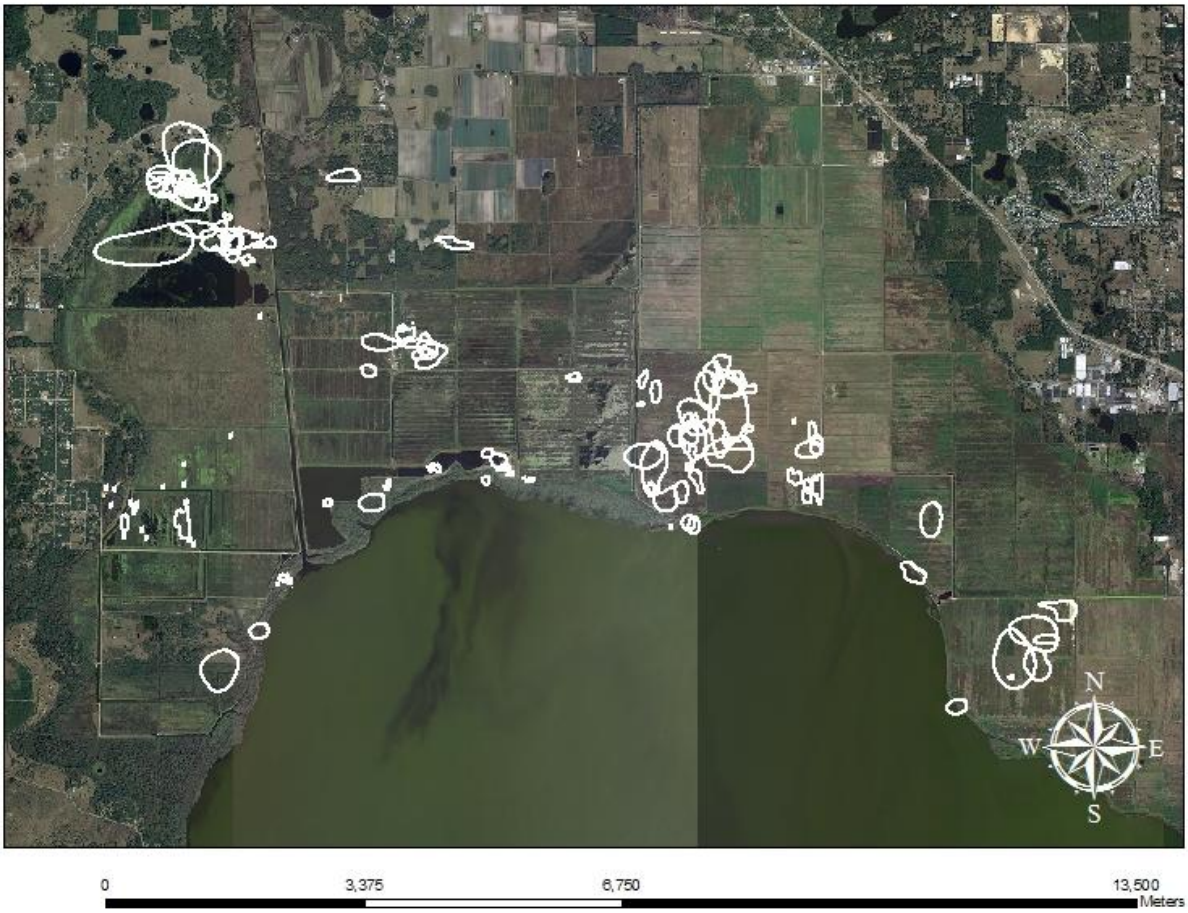

Figure 3.14. Composite of all juvenile alligator (n = 53) core home range sizes in Lake Apopka and the North Shore Restoration Area during 2008-09.

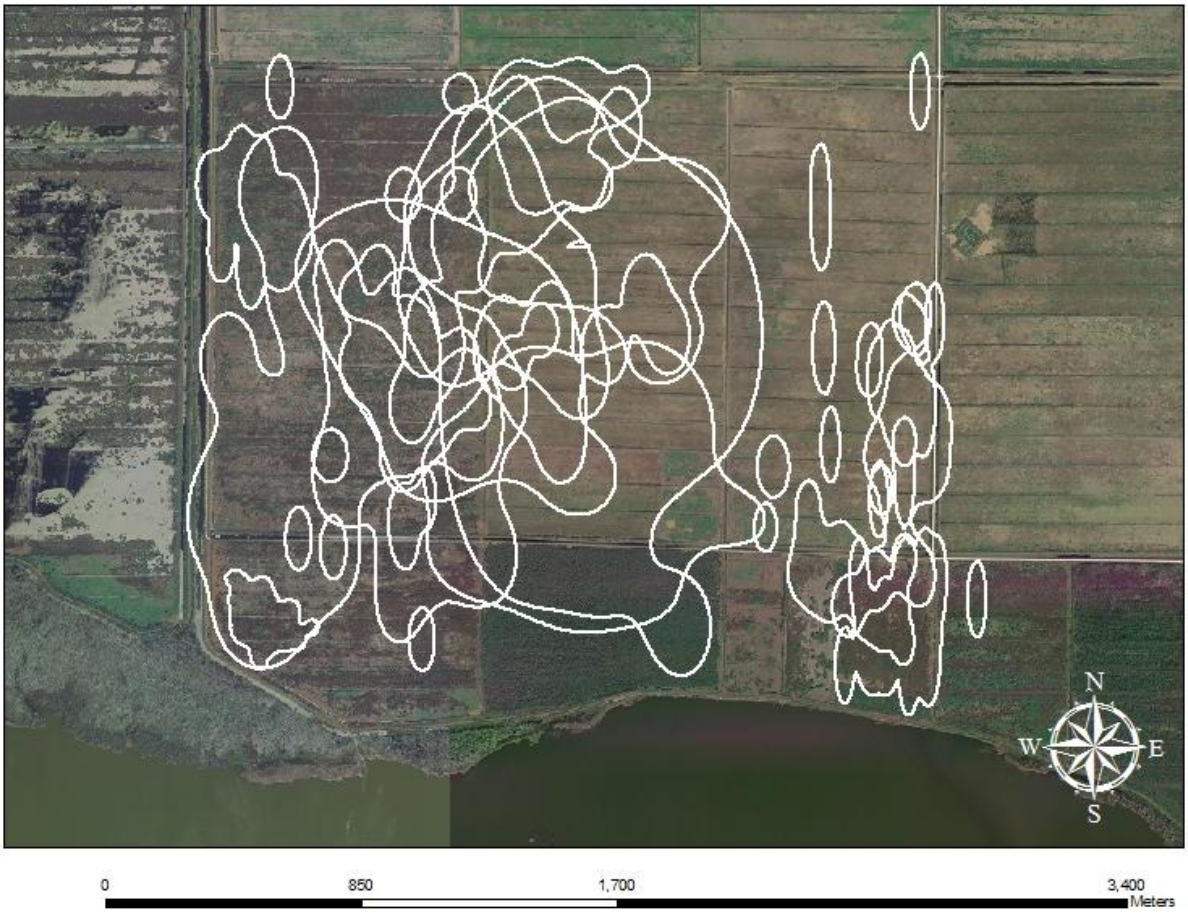

Figure 3.15. Distribution of total home ranges of juvenile alligators (n = 15) originally captured in Phase 1 of the North Shore Restoration Area during 2008-09.

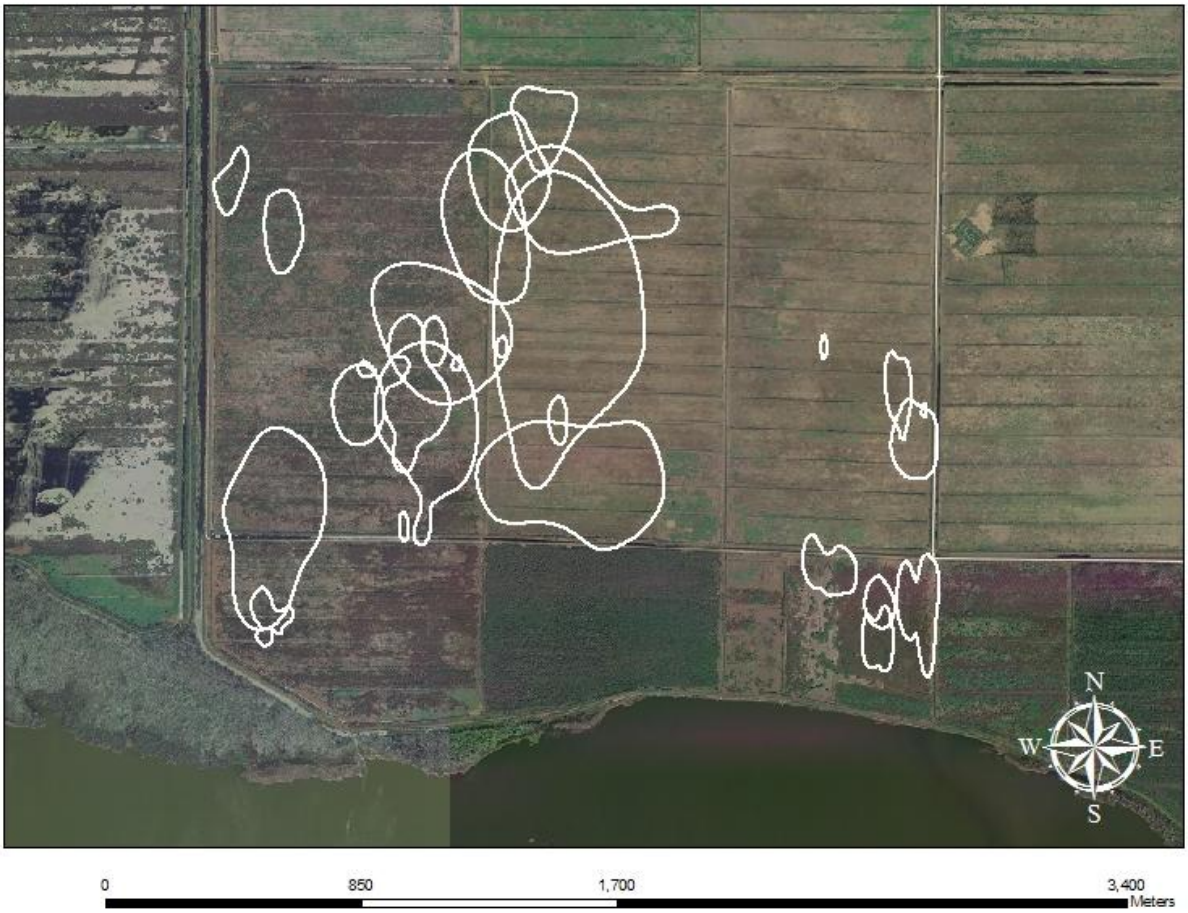

Figure 3.16. Distribution of core home ranges of juvenile alligators (n = 15) originally captured in Phase 1 of the North Shore Restoration Area during 2008-09.

Figure 3.17. Distribution of total home ranges of juvenile alligators (n = 16) originally captured in the West Marsh of the North Shore Restoration Area during 2008-09.

Figure 3.18. Distribution of core home ranges of juvenile alligators (n = 16) originally captured in the West Marsh of the North Shore Restoration Area during 2008-09.

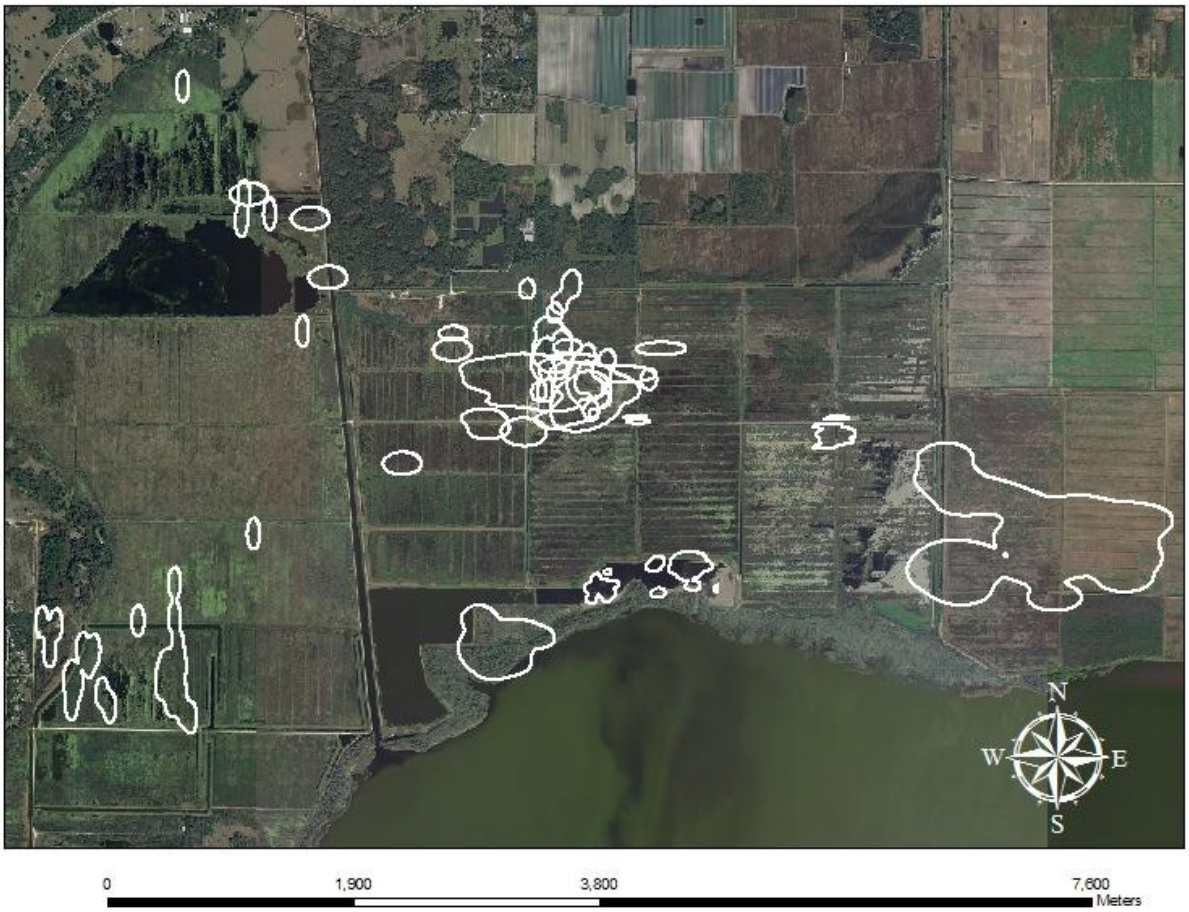

Figure 3.19. Distribution of total home ranges of juvenile alligators (n = 11) originally captured in the Duda Unit of the North Shore Restoration Area during 2008-09.

Figure 3.20. Distribution of core home ranges of juvenile alligators (n = 11) originally captured in the Duda Unit of the North Shore Restoration Area during 2008-09.

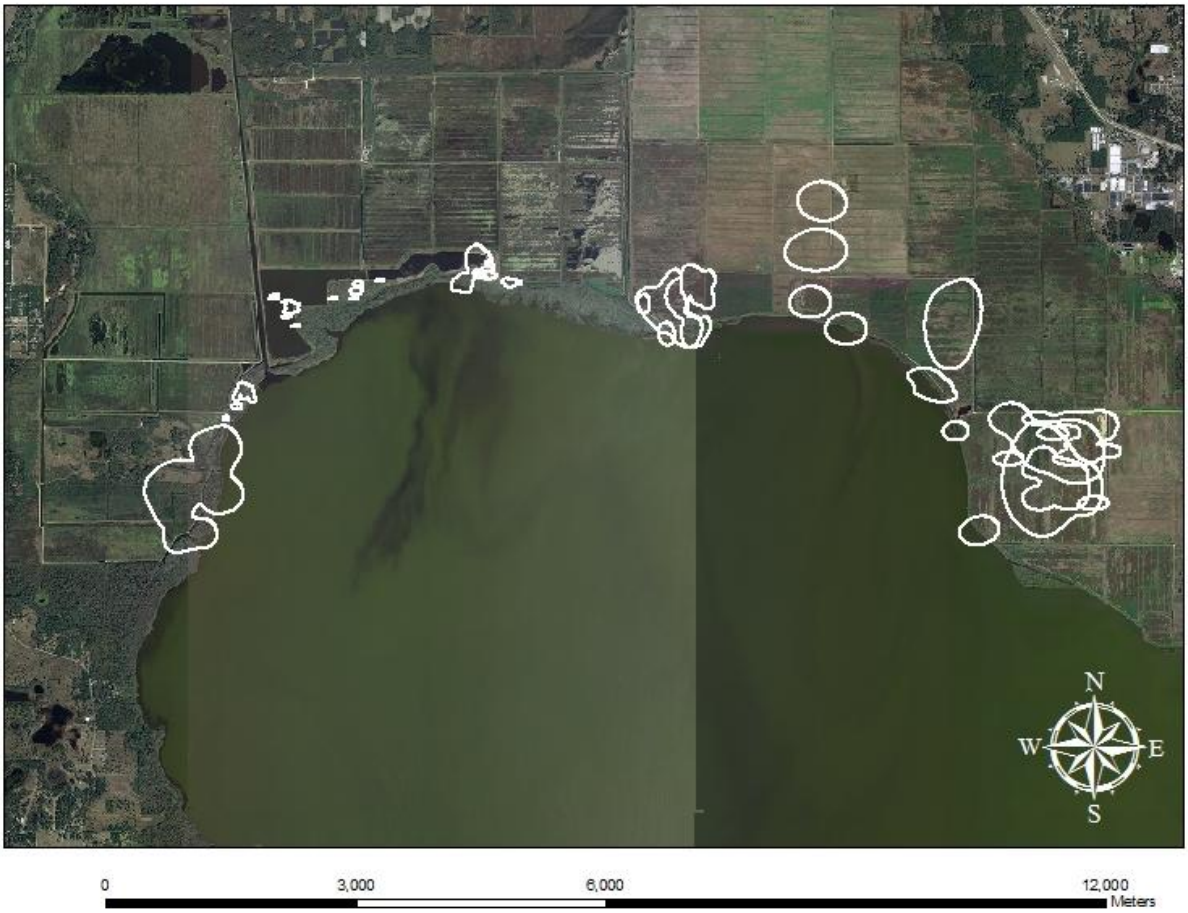

Figure 3.21. Distribution of total home ranges of juvenile alligators (n = 11) originally captured in Lake Apopka during 2008-09.

Figure 3.22. Distribution of core home ranges of juvenile alligators (n = 11) originally captured in Lake Apopka during 2008-09.

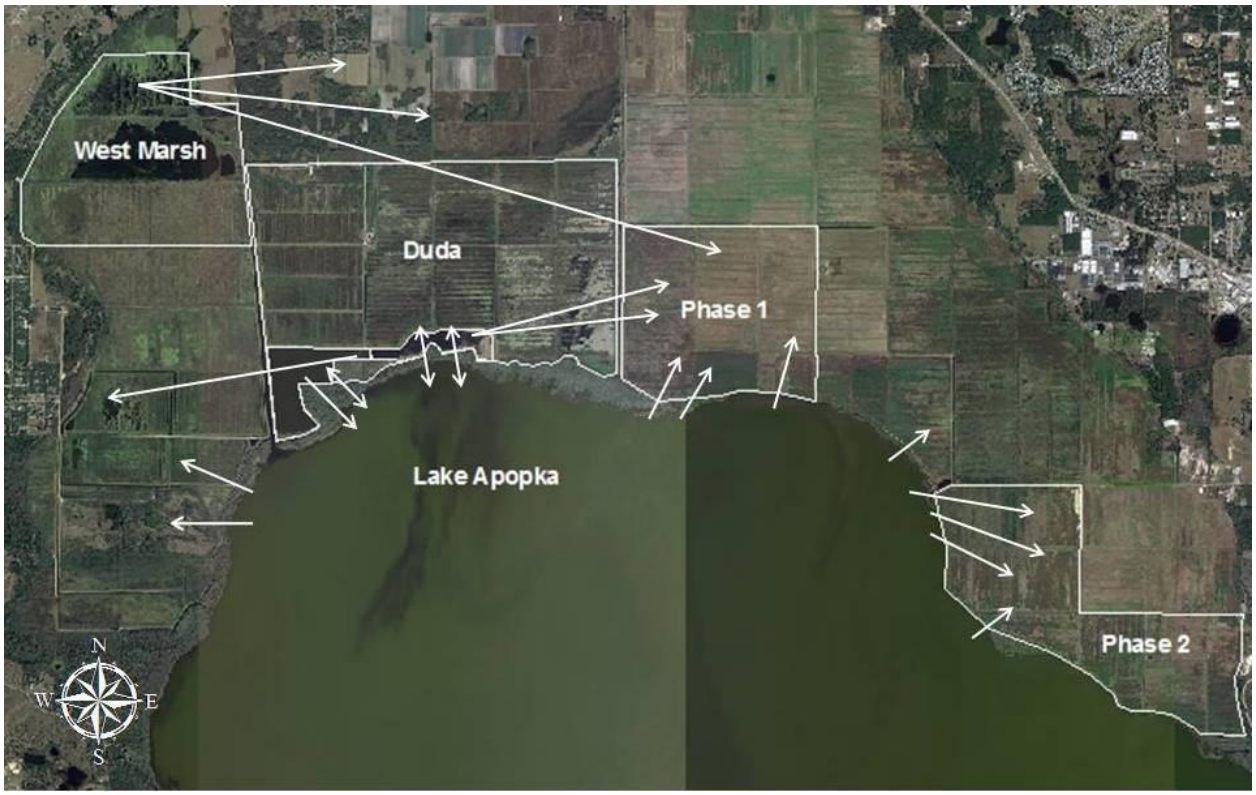

Figure 3.23. Movements of juvenile alligator among Lake Apopka and the North Shore Restoration Area units during 2008-09. Arrows represent direction of individual alligator movements.

CHAPTER 4
2008 MONITORING AND EVALUATION OF ORGANOCHLORINE PESTICIDES IN PIG FROGS, HATCHLING, AND JUVENILE ALLIGATORS

INTRODUCTION

In 2007, a study was initiated by the Florida Cooperative Fish and Wildlife Research Unit (FCFWRU), U.S. Fish and Wildlife Service (USFWS), and the St. Johns River Water Management District (SJRWMD) to examine the use of American alligators as potential bioindicators of organochlorine pesticide (OCP) accumulation within selected impoundments of the Lake Apopka North Shore Restoration Area (NSRA). Alligators may be susceptible to bioaccumulation of contaminants found in wetlands (Delany et al. 1988, Khan and Tansel 2000, Rumbold et al. 2002) due to their longevity and high trophic level (Delany and Abercrombie 1986, Ogden et al., 1974). Because of their longevity, trophic level, and limited home range (Goodwin and Marion 1979), they may reflect the degree of OCP contamination in their local environment (Campbell 2003, Raushenberger et al 2004, Milnes and Guillette 2008). Hatch rates and hatchling survival may reflect local ecosystem health because adult female alligators tend to have strong site fidelity (Joanen and McNease 1970, Goodwin and Marion 1979) and feed in limited areas compared to wading birds (Rootes and Chabreck 1993). The American alligator appears to be a good candidate for a surrogate to evaluate potential exposure and effects of OCPs on fish-eating birds. They not only have extended longevity, feed at a high trophic level, and have relatively high site fidelity (see Chapters 1-3), but they are oviparous and have easily identifiable nests, an attribute that contributes to their suitability as indicators of local OCP contamination.

Amphibians may transmit OCPs to their offspring through eggs and pollutants may impact their survival, growth, and reproduction (Hayes et al. 2006, Hopkins et al. 2006). Anurans may be particularly good indicators of ecosystem health and pollutant exposure because they may spend a considerable portion of their lives in contact with sediments, dermally absorb certain types of contaminants, and have a varied diet during their lifespan (Collins and Storfer 2003).

Our 2007 study evaluated 1) hatch rates and OCP concentrations in eggs of alligators from the NSRA and Lake Apopka, 2) OCP concentrations in tissues of juvenile alligators, and 3) OCP concentrations pig frogs (Appendix A). Hatch rates and OCP concentrations in eggs were evaluated to provide baseline information on reproductive success and exposure of alligators and added data to the historic data sets for Lake Apopka. Tissue samples were collected from euthanized juveniles to determine if their OCP concentrations differed among areas of capture. We also considered the likelihood of juveniles surviving the tissue sampling procedure had they not been euthanized beforehand (Appendix A).

Our 2007 study showed that OCP concentrations found in the alligator eggs from the NSRA were significantly higher than those from Lake Apopka, but no differences were detected in hatch rates between the areas (Appendix A). Furthermore, hatch rates were in the high-normal range for both areas compared to state averages. For juvenile alligators, OCP concentrations in tissues varied among impoundments, which suggested they may reflect OCP levels in their local habitats, making them a potential monitoring tool. We also found that collecting enough tissue

for OCP analyses would have severely impacted the health of the individual, and that other methods of long term sampling should be evaluated to avoid population-level effects.

During our 2007 study, OCPs were measured in pig frogs to evaluate the risk to piscivorous birds that may consume the frogs and to evaluate if concentrations in frogs differed among areas. Pig frogs were collected from Lake Apopka and three study units in the NSRA. Because Phase 1 was not flooded, all frogs in that unit were collected along the ditch adjacent to Roach Road (fig 1.1). NSRA pig frogs had significantly higher concentrations of DDE and oxychlordane in the compared to those from Lake Apopka. However, none of the levels posed a health risk to wading birds, and were lower than the concentrations found in fish from the same areas (Appendix A).

Based on the findings of the 2007 pilot study, the objectives of the 2008 amphibian and alligator monitoring studies were modified to evaluate 1) OCP concentrations in pig frogs from the recently flooded Phase 1 area, 2) bioaccumulation in hatchlings from the clutches that were collected in 2007, and 3) the potential use of blood as an indicator of body burdens in juvenile alligators.

METHODS

OCP concentrations in pig frogs from the Phase 1 Area (2008)

Because Phase 1 had a significant amount of water covering almost its entire area in 2008, our goal was to distribute the collection effort over the entire unit. Phase 1 was split into six sections, but the middle section south of Roach Road (ZS) was inaccessible. Therefore, we sampled five sections; ZNW-A, ZNW-B, ZNW-C, ZSW-A, ZSW-C (Fig. 4.1). We captured pig frogs at night by hand from an airboat in July 2008. Frogs were euthanized by benzocaine in the form of Orajel® Extra Strength (Chen and Combs 1999), wrapped in aluminum foil, and frozen. Frogs were shipped by the SJRWMD to Pace Analytical Laboratories in Madison, Wisconsin for analysis using previously described methods (Appendix A). All OCP concentrations are given as wet weight unless explicitly stated otherwise. Comparisons in OCP concentrations among the five sections within Phase 1 was conducted using lipid-adjusted (because lipid content strongly affects OCP content), log-transformed (to meet statistical assumptions) using a multiple comparison procedure (PROC GLM followed with Tukey; SAS, 9.1). OCP concentrations in pig frogs were also compared to toxicity reference values (TRVs) for OCP effects on fish-eating birds, which allowed us to evaluate risk. In order to consider a plausible worst case, the minimum detection limit was substituted in cases where the OCP concentration was determined to be below the limit of detection.

Hatchling bioaccumulation study (2008)

In summer 2008, we collected 11-month old hatchling alligators by hand at night from an airboat for OCP analysis. The goal was to collect one individual from each of the 2007 clutches that had been artificially incubated by the FCFWRU. For each hatchling that was collected, internal organs and a section of tail muscle were composited and analyzed for OCP concentrations. All OCP concentrations are presented as wet weight concentrations. The results were then compared to OCP TRVs for fish-eating birds (USFWS 2002) to evaluate risk because large wading birds may prey upon hatchlings (Kushlan 1979). We compared the relation between OCP

concentrations in hatchlings and clutches via pair-wise comparisons to determine if lipid-adjusted, log-transformed concentrations differed between hatchling and egg. We conducted linear regression between OCP concentrations in hatchlings and OCP concentrations in eggs to examine trends. In order to consider a plausible worst case, we substituted the minimum detection limit in cases where the OCP concentration was determined to be below the limit of detection.

Juvenile alligator study evaluating OCP concentrations in blood and tissues and fasting effects (2008)

We collected alligators by hand at night from an airboat in July 2008 (Appendix F). We attempted to collect five alligators from each impoundment, but due to low water levels in the Duda unit we were not able to collect a balanced sample. Collections consisted of: five from Lake Apopka, five from Unit 2 West, five from the West Marsh, and two from Duda for a total of 17 (Fig. 4.6). Upon capture, we immediately drew a blood sample from each alligator.

We housed alligators at the FWC Wildlife Research Laboratory in tanks specifically built to house alligators. Alligators were provided fresh water, closely monitored, and fasted for 19 days. Blood sampling was repeated on fasting day 7, 14, and 19. On day 19 of fasting, we euthanized alligators (cervical dislocation with double pithing), and we collected blood, liver and fat samples for OCP analysis. OCPs were measured in the blood of each alligator for day 0 (initial collection), 7, 14, and 19, as well as liver and fat. We sent six samples (four blood, one fat and one liver) from each individual to Pace Lab for OCP analysis. In order to consider a plausible worst case, the minimum detection limit was substituted in cases where the OCP concentration was determined to be below the limit of detection.

We compared lipid and OCP concentrations in blood among timepoints using PROC GLM (repeated anova), using log transformed wet weight concentration to meet statistical assumptions. We evaluated linear associations between blood and fat among the time points and between blood and liver by conducting linear regression analyses between OCP concentrations (log ng/g ww) of liver, fat, and the different blood sample time points. We evaluated each model's fitness by examining the R-square values and the AIC (Akaike's information criterion).

RESULTS

Pig Frogs

We captured 30 pig frogs within Phase 1 (Fig. 4.1). Five frogs came from ZNW-A, five from ZNW-B, five from ZNW-C, eight from ZSW-A, and six from ZSW-C. We combined frogs (2-3 frogs per composite), and we analyzed 2-3 composites per area for OCPs (Table 4.1).

We were not able to collect any frogs from ZSW-B. Because many young pig frogs were observed in metamorphosis in the unit, it was likely that those captured had spent their lives in that impoundment. All OCPs of concern (bolded) were well below toxicity reference values (TRV) for fish-eating birds (Table 4.1). Even with the small sample size, we were able to detect significant differences among areas (Fig. 4.2 and 4.3). Although well below TRVs for fish-eating birds, pig frogs from Areas ZNW-C and ZSW-C were consistently higher than those of other areas for many of the OCPs.

Hatchling bioaccumulation study

Our objective was to sacrifice up to 15 hatchlings from Lake Apopka and up to 15 hatchlings from the NSRA. However, water levels and vegetation made animals difficult to locate and capture. We collected 17 hatchlings for OCP analysis; Lake Apopka (n = 5), Duda (n = 2), Phase 1 (n = 5), and West Marsh (n = 5). All OCPs of concern (bolded in Table 4.2) were below toxicity reference values (TRV) for fish-eating birds, except for 4,4'-DDE (1,698 ±1,343 ng/g) and DDTx (1,702 ± 1,344 ng/g). The TRV for fish-eating birds is 1,500 ng/g wet weight for 4,4'-DDE and DDTx, separately (Table 4.2). Even with the small sample size, we detected significant differences among areas in a few cases. Although well below TRVs for fish-eating birds, OCPs of main concern in hatchlings from the West Marsh were consistently higher than those of other areas (Fig. 4.4).

We detected linear associations between hatchling and egg concentrations for toxaphene and total chlordane ($P < 0.05$) (Fig. 4.5). Paired difference t-test (paired by clutch) of log-transformed, lipid-adjusted concentrations of OCPs indicated eggs had higher concentrations than those of hatchlings for trans-nonachlor, but lower for 4.4'-DDT and endrin aldehyde (Table 4.3). We did not detect other significant differences ($P > 0.05$) between OCP concentrations in eggs and hatchlings (Table 4.3). Raw data for all OCP analysis can be found in Appendix G.

Juvenile alligator study evaluating OCP concentrations in blood and tissues and fasting effects (2008)

Blood lipid percent for day-0 (0.19 ± 0.10%) was significantly higher than day-7 (0.13 ± 0.05%; $P = 0.001$), day-14 (0.12 ± 0.04%; $P = 0.002$), and day-19 (0.11 ± 0.03%; $P = 0.004$). Because blood lipid percent is a strong covariate with OCPs, OCP values were lipid-adjusted and log-transformed for comparison of the different time points. Comparisons of lipid-adjusted, log-transformed OCP concentrations among the time points indicated that day-0 OCP concentrations were significantly less ($P < 0.05$) than those of other time points for toxaphene, and sum OCPs (Table 4.4). Therefore, we concluded that fasting resulted in lowered blood lipid percent, but increased OCP concentrations in the lipid fraction of blood.

We found no significant linear associations ($P > 0.05$) between OCP concentrations in blood collected on day-0 and fat OCP concentrations (Figs. 4.7-4.11). Day-7 blood concentrations had significant associations ($P < 0.001$) for 4,4'-DDE (Fig. 4.9). Day-14 blood concentrations had significant associations ($P < 0.05$) for dieldrin (Fig. 4.8), 4,4'-DDE Fig. (4.9), and total OCPs (Fig. 4.11). In the day-19 blood concentrations, only 4,4'-DDE (Fig. 4.9) was determined to have a significant linear association ($P < 0.001$) with fat concentration. Detailed results from the fasting study can be found in Appendix H.

DISCUSSION

Pig Frogs

Data from both the 2007 study (Appendix A) and 2008 study of pig frogs in the NSRA indicated that all OCPs of concern were well below toxicity reference values (TRV) for fish-eating birds. Therefore, we conclude that fish-eating birds can safely consume frogs that move into newly

reflooded restoration areas, if OCP soil concentrations and habitat management are similar to the areas where frogs were collected in 2007 and 2008.

We suggest the reason that OCP concentrations in frogs were negligible in regard to risk to birds and lower than fish collected from Phase 1, is that lipid levels in frogs were much lower than those of fish (SJRWMD, unpubl. data). Ranges in blood lipid percent (0.54%-1.64%) and 4,4'DDE wet weight concentrations (14.7-266 ng/g) in frogs did not overlap those of fish (4.6%-8.8%; 963-3,300 ng/g, respectively). In contrast, lipid-adjusted 4,4'-DDE concentrations in frogs (896.3-40,303 ng/g lipid) did overlap those of fish (12,045-66,000 ng/g lipid), indicating that exposures between frogs and fish were similar but suggesting the ability of frogs to bioaccumulate was limited because their low lipid content reduced their OCP storage capacity.

The significant differences in OCP concentrations in pig frogs from the different areas (Fig. 4.2 and 4.3) within Phase 1 suggests that frogs may be local indicators of OCP exposure, however the degree of confidence in this observation is limited because of the low number of samples from each unit.

Hatchling alligator bioaccumulation study

Mean 4,4'-DDE concentrations for West Marsh hatchlings slightly exceeded the TRV of 1,500 ng/g wet weight for 4,4'-DDE. However, the likelihood of fish-eating birds experiencing eggshell thinning from consumption of hatchling alligators is negligible because the TRV is very conservative and is based on the assumption that the entire diet of the bird would consist of West Marsh hatchlings. West Marsh hatchlings and eggs had higher OCP concentrations than other areas, which is consistent with the concept that their environmental exposure mirrored their endogenous exposure.

The significant linear associations (Fig. 4.5) between hatchling and egg concentrations for toxaphene and total chlordane also suggested hatchlings from clutches with higher concentrations of OCPs will maintain elevated concentrations compared to hatchlings from clutches with lower concentrations.

Juvenile alligator study evaluating OCP concentrations in blood and tissues and fasting effects (2008)

Because lipid% for day 0 was significantly higher than the other time points and lipid-adjusted, log-transformed OCP concentrations differed among the time points for 4,4-DDT, aldrin, heptachlor epoxide, oxychlordane, trans-nonachlor, toxaphene, and Total OCPs (Table 4.4). We concluded that fasting results in lowered blood lipid%, but increases OCP concentrations in the lipid fraction of blood. We therefore suggest that fasting causes a reduction in blood lipids and that the body lipids which are mobilized contain relatively higher concentrations of OCPs.

By fasting alligators for seven days or more we improved our ability to use OCP levels in their blood to estimate total OCP concentrations in their fat and liver. Therefore, we suggest that blood samples from **7**-day fasted alligators are reflective of total OCP concentrations in the body and do not solely represent OCP concentrations from recently ingested items. We further suggest that blood samples from 7-day fasted alligators may be a noninvasive way to monitor OCP exposure in a given area, if the alligators' home ranges are known. Future studies might combine OCP analyses of fasted alligators with telemetry-tracking to further evaluate the use of juvenile alligators as a method for monitoring OCP exposure in wildlife within the NSRA.

Table 4.1. Comparison of organochlorine pesticide concentrations in pig frogs (whole body, µg/kg wet weight) collected from areas within Phase 1. Different letters beside the means indicate significant differences (P < 0.05) after lipid normalization and log transformation.

Constituent	Data	ZNW-A	ZNW-B	ZNW-C	ZSW-A	ZSW-C	Overall
Lipid (%)	$\bar{x}$	1.42	1.35	1.4	1.81	1.97	1.64
	SD	1.1	0.21	0.42	1.1	0.29	0.66
	Min	0.64	1.2	1.1	0.54	1.8	0.54
	Max	2.2	1.5	1.7	2.5	2.3	2.5
4,4'-DDE	$\bar{x}$	38.8 B	38.05 B	99.05 AB	48.4 B	211.33 A	94.25
	SD	22.34	17.04	43.77	33.12	48.84	79.55
	Min	23	26	68.1	14.7	172	14.7
	Max	54.6	50.1	130	80.9	266	266
4,4'-DDT	$\bar{x}$	0.38	0.38	0.38	0.38	0.62	0.44
	SD	0	0	0	0	0.21	0.14
	Min	0.38	0.38	0.38	0.38	0.38	0.38
	Max	0.38	0.38	0.38	0.38	0.77	0.77
4,4'-DDTr	$\bar{x}$	3.07 B	3.02 B	7.08 AB	3.71 C	14.84 A	6.83
	SD	1.49	1.14	2.92	2.21	3.41	5.43
	Min	2.01	2.21	5.02	1.46	11.95	1.46
	Max	4.12	3.82	9.15	5.87	18.6	18.6
4,4'-DDTx	$\bar{x}$	39.68 B	38.93 B	99.93 AB	49.28 B	212.59 A	95.22
	SD	22.34	17.04	43.77	33.12	49.09	79.73
	Min	23.88	26.88	68.98	15.58	172.88	15.58
	Max	55.48	50.98	130.88	81.78	267.47	267.47
Dieldrin	$\bar{x}$	0.4 B	0.32 B	3.2 A	0.75 B	5.63 A	2.25
	SD	0.04	0	2.4	0.37	0.8	2.42
	Min	0.37	0.32	1.5	0.32	4.8	0.32
	Max	0.42	0.32	4.9	1	6.4	6.4
Toxaphene	$\bar{x}$	24	24	24	24	28.33	25.08
	SD	0	0	0	0	3.86	2.56
	Min	24	24	24	24	24	24
	Max	24	24	24	24	31.4	31.4
Total Chlordane	$\bar{x}$	4.53	4.41	8.4	4.12	16.07	7.94
	SD	0.66	0.07	3.44	1.17	3.39	5.47
	Min	4.06	4.36	5.97	2.93	12.16	2.93
	Max	4.99	4.46	10.83	5.27	18.09	18.09
4,4'-DDD	$\bar{x}$	0.5	0.5	0.5	0.5	0.63	0.53
	SD	0	0	0	0	0.13	0.08
	Min	0.5	0.5	0.5	0.5	0.5	0.5
	Max	0.5	0.5	0.5	0.5	0.76	0.76
Aldrin	$\bar{x}$	0.36	0.36	0.36	0.36	0.36	0.36
	SD	0	0	0	0	0	0
	Min	0.36	0.36	0.36	0.36	0.36	0.36
	Max	0.36	0.36	0.36	0.36	0.36	0.36
alpha-BHC	$\bar{x}$	0.4	0.4	0.4	0.4	0.4	0.4
	SD	0	0	0	0	0	0
	Min	0.4	0.4	0.4	0.4	0.4	0.4
	Max	0.4	0.4	0.4	0.4	0.4	0.4
alpha-Chlordane	$\bar{x}$	0.27	0.27	0.27	0.28	0.77	0.4
	SD	0	0	0	0.02	0.52	0.32

Constituent	Data	ZNW-A	ZNW-B	ZNW-C	ZSW-A	ZSW-C	Overall
	Min	0.27	0.27	0.27	0.27	0.27	0.27
	Max	0.27	0.27	0.27	0.3	1.3	1.3
beta-BHC	$\bar{x}$	0.46	0.46	0.46	0.46	0.46	0.46
	SD	0	0	0	0	0	0
	Min	0.46	0.46	0.46	0.46	0.46	0.46
	Max	0.46	0.46	0.46	0.46	0.46	0.46
cis-Nonachlor	$\bar{x}$	0.34	0.32	0.51	0.32	1.97	0.77
	SD	0.02	0	0.11	0.01	0.45	0.75
	Min	0.32	0.32	0.43	0.32	1.5	0.32
	Max	0.35	0.32	0.59	0.33	2.4	2.4
delta-BHC	$\bar{x}$	0.5	0.5	0.5	0.5	0.51	0.5
	SD	0	0	0	0	0.01	0.01
	Min	0.5	0.5	0.5	0.5	0.5	0.5
	Max	0.5	0.5	0.5	0.5	0.52	0.52
Endosulfan I	$\bar{x}$	0.29	0.29	0.29	0.29	0.29	0.29
	SD	0	0	0	0	0	0
	Min	0.29	0.29	0.29	0.29	0.29	0.29
	Max	0.29	0.29	0.29	0.29	0.29	0.29
Endosulfan II	$\bar{x}$	0.49	0.49	0.49	0.49	0.49	0.49
	SD	0	0	0	0	0	0
	Min	0.49	0.49	0.49	0.49	0.49	0.49
	Max	0.49	0.49	0.49	0.49	0.49	0.49
Endosulfan sulfate	$\bar{x}$	0.8	0.8	0.8	0.8	0.87	0.82
	SD	0	0	0	0	0.12	0.06
	Min	0.8	0.8	0.8	0.8	0.8	0.8
	Max	0.8	0.8	0.8	0.8	1	1
Endrin	$\bar{x}$	0.36	0.65	0.36	0.36	0.36	0.41
	SD	0	0.41	0	0	0	0.17
	Min	0.36	0.36	0.36	0.36	0.36	0.36
	Max	0.36	0.94	0.36	0.36	0.36	0.94
Endrin aldehyde	$\bar{x}$	1.4	1.4	1.4	1.4	1.43	1.41
	SD	0	0	0	0	0.06	0.03
	Min	1.4	1.4	1.4	1.4	1.4	1.4
	Max	1.4	1.4	1.4	1.4	1.5	1.5
Endrin ketone	$\bar{x}$	0.6	0.6	0.6	0.6	0.6	0.6
	SD	0	0	0	0	0	0
	Min	0.6	0.6	0.6	0.6	0.6	0.6
	Max	0.6	0.6	0.6	0.6	0.6	0.6
gamma-BHC (Lindane)	$\bar{x}$	0.27	0.27	0.27	0.27	0.28	0.27
	SD	0	0	0	0	0.01	0.01
	Min	0.27	0.27	0.27	0.27	0.27	0.27
	Max	0.27	0.27	0.27	0.27	0.29	0.29
gamma-Chlordane	$\bar{x}$	0.75	0.75	0.75	0.75	0.79	0.76
	SD	0	0	0	0	0.08	0.04
	Min	0.75	0.75	0.75	0.75	0.75	0.75
	Max	0.75	0.75	0.75	0.75	0.88	0.88
Heptachlor	$\bar{x}$	0.36	0.36	0.36	0.36	0.54	0.41
	SD	0	0	0	0	0.31	0.16
	Min	0.36	0.36	0.36	0.36	0.36	0.36

Constituent	Data	ZNW-A	ZNW-B	ZNW-C	ZSW-A	ZSW-C	Overall
	Max	0.36	0.36	0.36	0.36	0.9	0.9
Heptachlor epoxide	$\bar{x}$	0.38	0.38	0.38	0.38	0.38	0.38
	SD	0	0	0	0	0	0
	Min	0.38	0.38	0.38	0.38	0.38	0.38
	Max	0.38	0.38	0.38	0.38	0.38	0.38
Methoxychlor	$\bar{x}$	1.8	1.8	1.8	1.8	2.07	1.87
	SD	0	0	0	0	0.46	0.23
	Min	1.8	1.8	1.8	1.8	1.8	1.8
	Max	1.8	1.8	1.8	1.8	2.6	2.6
Oxychlordane	$\bar{x}$	2.05 BC	1.95 BC	5.75 AB	1.59 C	10.23 A	4.58
	SD	0.64	0.07	3.32	1.07	2.94	4.08
	Min	1.6	1.9	3.4	0.46	7.6	0.46
	Max	2.5	2	8.1	2.6	13.4	13.4
trans-Nonachlor	$\bar{x}$	0.38	0.38	0.38	0.44	1.38	0.65
	SD	0	0	0	0.1	0.88	0.58
	Min	0.38	0.38	0.38	0.38	0.82	0.38
	Max	0.38	0.38	0.38	0.56	2.4	2.4

Table 4.2. Lipid and OCP concentrations in tissues of hatchling alligator specimens collected from Lake Apopka and the NSRA in 2008. Different letters beside the means indicate significant differences ($P < 0.05$) after lipid normalization and log transformation.

Constituent	*n*	Lake (5)	Duda (2)	Phase 1 (5)	West Marsh (5)	Total (17)
Lipid	$\bar{x}$	1.34	1.40	1.64	1.35	1.44
	SD	0.31	0.14	0.38	0.35	0.33
	Min	1.00	1.30	1.20	0.94	0.94
	Max	1.80	1.50	2.20	1.80	2.20
4,4'-DDE	$\bar{x}$	124.38	1010.95	454.20	**1697.58**	788.39
	SD	106.76	1313.88	179.30	**1343.70**	1003.67
	Min	53.50	81.90	277.00	64.90	53.50
	Max	310.00	1940.00	729.00	3210.00	3210.00
4,4'-DDTr	$\bar{x}$	9.40	69.13	31.87	115.32	54.19
	SD	7.70	88.53	13.09	90.30	67.56
	Min	4.83	6.53	19.36	5.02	4.83
	Max	22.92	131.73	52.50	216.76	216.76
4,4'-DDTx	$\bar{x}$	126.44	1013.69	457.74	**1702.87**	791.92
	SD	107.10	1315.66	182.00	**1344.86**	1005.12
	Min	55.80	83.37	279.41	66.16	55.80
	Max	312.87	1944.00	738.50	3215.00	3215.00
Dieldrin	$\bar{x}$	2.02 B	7.7 AB	14.08 A	13.4 A	9.58
	SD	2.00	9.19	4.69	8.33	7.64
	Min	0.32	1.20	9.90	1.80	0.32
	Max	5.50	14.20	21.40	25.10	25.10
Total Chlordane	$\bar{x}$	8.45	24.55	13.53	59.73	26.92
	SD	5.47	18.97	3.57	59.94	37.83
	Min	4.85	11.13	9.55	7.23	4.85
	Max	18.04	37.96	17.26	142.40	142.40
Toxaphene	$\bar{x}$	38.00 B	40.55 B	49.36 AB	72.18 A	51.69
	SD	19.49	23.41	10.19	20.24	21.55
	Min	24.00	24.00	39.50	49.90	24.00
	Max	64.00	57.10	66.40	98.70	98.70
4,4'-DDT	$\bar{x}$	0.87	1.49	1.10	1.37	1.16
	SD	0.73	0.73	0.82	0.69	0.71
	Min	0.38	0.97	0.51	0.55	0.38
	Max	2.10	2.00	2.50	2.20	2.50
4,4'-DDD	$\bar{x}$	1.19	1.25	2.44	3.92	2.37
	SD	0.51	1.06	2.60	2.32	2.13
	Min	0.77	0.50	0.50	0.71	0.50
	Max					

Constituent	*n*	Lake (5)	Duda (2)	Phase 1 (5)	West Marsh (5)	Total (17)
Aldrin	$\bar{x}$	0.52	0.62	0.51	1.23	0.74
	SD	0.27	0.36	0.21	0.75	0.53
	Min	0.36	0.36	0.36	0.36	0.36
	Max	0.97	0.87	0.78	2.10	2.10
alpha-BHC	$\bar{x}$	0.59	0.68	0.43	1.19	0.73
	SD	0.30	0.40	0.06	0.89	0.58
	Min	0.40	0.40	0.40	0.40	0.40
	Max	1.10	0.96	0.54	2.30	2.30
alpha-Chlordane	$\bar{x}$	0.64	0.87	0.87	1.16	0.89
	SD	0.14	0.47	0.48	0.53	0.43
	Min	0.50	0.54	0.49	0.63	0.49
	Max	0.84	1.20	1.70	1.90	1.90
beta-BHC	$\bar{x}$	0.67	0.82	0.59	1.35	0.86
	SD	0.32	0.40	0.18	1.01	0.64
	Min	0.46	0.54	0.46	0.46	0.46
	Max	1.20	1.10	0.86	2.60	2.60
cis-Nonachlor	$\bar{x}$	1.61	1.65	1.88	10.01	4.16
	SD	2.41	0.21	0.78	11.61	7.10
	Min	0.32	1.50	1.20	0.54	0.32
	Max	5.90	1.80	2.90	26.70	26.70
delta-BHC	$\bar{x}$	2.16	0.85	0.63	1.64	1.40
	SD	3.17	0.49	0.20	0.95	1.79
	Min	0.50	0.50	0.50	0.68	0.50
	Max	7.80	1.20	0.97	2.80	7.80
Endosulfan I	$\bar{x}$	0.42	0.49	0.31	0.84	0.52
	SD	0.21	0.28	0.04	0.61	0.40
	Min	0.29	0.29	0.29	0.29	0.29
	Max	0.77	0.69	0.39	1.60	1.60
Endosulfan II	$\bar{x}$	0.71 B	0.85 B	0.83 B	1.84 A	1.09
	SD	0.35	0.50	0.11	0.84	0.69
	Min	0.49	0.49	0.70	0.71	0.49
	Max	1.30	1.20	1.00	2.80	2.80
Endosulfan sulfate	$\bar{x}$	1.14 AB	1.35 AB	0.86 B	2.60 A	1.51
	SD	0.56	0.78	0.13	1.55	1.13
	Min	0.80	0.80	0.80	1.20	0.80
	Max	2.10	1.90	1.10	4.50	4.50
Endrin	$\bar{x}$	0.82	0.69	0.39	1.08	0.75
	SD	0.70	0.26	0.06	0.81	0.61
	Min	0.36	0.50	0.36	0.36	0.36
	Max					

Constituent	*n*	Lake (5)	Duda (2)	Phase 1 (5)	West Marsh (5)	Total (17)
Endrin aldehyde	$\bar{x}$	4.06	6.00	3.42	4.56	4.25
	SD	2.63	3.54	2.09	2.94	2.53
	Min	1.40	3.50	1.90	1.70	1.40
	Max	7.30	8.50	6.30	8.20	8.50
Endrin ketone	$\bar{x}$	0.90	1.00	0.68	1.77	1.10
	SD	0.45	0.57	0.11	1.31	0.85
	Min	0.60	0.60	0.60	0.64	0.60
	Max	1.60	1.40	0.80	3.40	3.40
gamma-BHC (Lindane)	$\bar{x}$	1.27	0.49	0.47	0.83	0.81
	SD	1.66	0.22	0.35	0.58	0.96
	Min	0.27	0.33	0.27	0.27	0.27
	Max	4.20	0.64	1.10	1.50	4.20
gamma-Chlordane	$\bar{x}$	1.12	1.28	0.89	2.21	1.39
	SD	0.53	0.74	0.29	1.65	1.06
	Min	0.75	0.75	0.75	0.75	0.75
	Max	2.00	1.80	1.40	4.20	4.20
Heptachlor	$\bar{x}$	0.69	0.61	0.45	1.15	0.75
	SD	0.24	0.35	0.15	0.92	0.57
	Min	0.36	0.36	0.36	0.36	0.36
	Max	0.96	0.86	0.71	2.30	2.30
Heptachlor epoxide	$\bar{x}$	0.88	1.09	0.94	1.46	1.10
	SD	0.63	1.00	0.48	0.62	0.61
	Min	0.38	0.38	0.44	0.71	0.38
	Max	1.90	1.80	1.50	2.20	2.20
Methoxychlor	$\bar{x}$	2.64	3.10	1.94	5.42	3.31
	SD	1.35	1.84	0.31	4.04	2.63
	Min	1.80	1.80	1.80	1.80	1.80
	Max	4.90	4.40	2.50	10.40	10.40
Oxychlordane	$\bar{x}$	1.12 B	5.70 AB	2.52 AB	14.84 A	6.11
	SD	0.62	5.52	0.89	15.08	9.73
	Min	0.46	1.80	1.30	1.40	0.46
	Max	2.10	9.60	3.40	34.50	34.50
trans-Nonachlor	$\bar{x}$	2.38 B	13.35 AB	5.98 AB	28.90 A	12.53
	SD	1.94	11.10	1.88	29.83	19.01
	Min	1.00	5.50	4.50	2.20	1.00
	Max	5.70	21.20	8.70	70.90	70.90

Table 4.3. Comparisons of OCP concentrations in alligator hatchlings and eggs from corresponding clutches. All concentrations are lipid-adjusted values (ng/g lipid). *Indicates P < 0.05 for log-transformed lipid-adjusted concentrations.

Constituent		Hatchlings (n = 17)	Eggs (n = 17)
4,4'-DDD	$\bar{x}$	181.48	1292.37
	SD	189.45	1639.2
	Min	29.41	5.34
	Max	734.04	4671.05
4,4'-DDE	$\bar{x}$	54237.12	39878.8
	SD	77053.06	37798.65
	Min	2972.22	304.1
	Max	235000	124401.9
4,4'-DDT	$\bar{x}$	76.81	47.5*
	SD	44.84	39.94
	Min	27.14	4.13
	Max	158.33	170.1
4,4'-DDTr	$\bar{x}$	3728.91	2876.7
	SD	5192.33	2742.3
	Min	268.15	45.99
	Max	15896.67	8752.79
4,4'-DDTx	$\bar{x}$	54495.4	40703.49
	SD	77206.94	38839.62
	Min	3100	5.19
	Max	235516.7	126315.8
alpha-Chlordane	$\bar{x}$	60.98	565.95
	SD	28.52	786.9
	Min	33.53	10.7
	Max	125	2009.57
cis-Nonachlor	$\bar{x}$	307.86	683.66
	SD	505.64	796.17
	Min	22.86	19.79
	Max	1668.75	2488.04
Dieldrin	$\bar{x}$	683.39	1200.92
	SD	677.57	1121.29
	Min	32	22.54
	Max	2670.21	4449.76
Endrin	$\bar{x}$	53.79	53.75
	SD	45.1	52.03
	Min	16.36	3.47
	Max	150	177.63
Endrin aldehyde	$\bar{x}$	301.5	107.7*
	SD	175.89	79.49
	Min	86.36	13.87
	Max	600	263.16
gamma-Chlordane	$\bar{x}$	98.95	155.86
	SD	79.86	178.23
	Min	34.09	7.23
	Max	316.67	605.26
Heptachlor epoxide	$\bar{x}$	74.33	4393.57
	SD	44.15	11703.62

Constituent		Hatchlings (n = 17)	Eggs (n = 17)
	Min	25.33	3.76
	Max	158.33	34374.33
Oxychlordane	$\bar{x}$	432.66	350.67
	SD	721.52	314.37
	Min	41.82	4.34
	Max	2275	1052.63
Total Chlordane	$\bar{x}$	1903.65	3721.52
	SD	2760.94	4642.77
	Min	346.43	151.87
	Max	8900	15416.27
Toxaphene	$\bar{x}$	3670.43	5946.76
	SD		
	Min	1600	540.11
	Max	8063.83	19078.95
trans-Nonachlor	$\bar{x}$	875.02	2101.52*
	SD	1374	2446.74
	Min	55.56	36.99
	Max	4431.25	9090.91

Table 4.4. Comparisons of OCP concentrations (lipid-adjusted) among time points for juvenile alligators (n = 16). Different letters indicate significant differences ($P < 0.05$) for lipid-adjusted OCP concentrations. Analysis conducted using log-transformed values and PROC GLM using Least Squares Means for repeated measures (individuals).

Constituent		Day-0	Day-7	Day-14	Day-19
4,4'-DDD	$\bar{x}$	1,452.31	1,143.74	1,226.18	1,442.38
	SD	2,381.79	489.57	469.06	1,676.75
	Min	1.30	500.00	625.00	461.90
	Max	10,153.85	2,250.00	2,400.00	7,600.00
4,4'-DDE	$\bar{x}$	25,910.79 AB	28,368.45 B	27,662.93 B	33,449.68 A
	SD	26,754.77	42,283.96	29,185.42	37,982.73
	Min	6.90	2,900.00	2,300.00	2,466.67
	Max	74,000.00	165,384.62	103,529.41	138,333.33
4,4'-DDT	$\bar{x}$	636.72	889.53	957.53	1118.90
	SD	421.47	376.16	361.87	1,299.98
	Min	1.00	392.86	458.33	361.90
	Max	1,600.00	1,750.00	1,800.00	5,900.00
4,4'-DDTr	$\bar{x}$	2,654.57	3,009.50	3,046.96	3,637.36
	SD	2,181.24	2,813.38	1,993.45	2,736.82
	Min	1.72	780.95	1,080.56	940.00
	Max	7,315.38	12,087.18	7,578.43	9,935.56

Constituent		Day-0	Day-7	Day-14	Day-19
4,4'-DDTx	$\bar{x}$	27,999.82	30,401.71	29,846.64	36,010.96
	SD	28,128.02	42,207.91	29,198.23	37,523.59
	Min	9.20	4,223.08	5,091.67	5,066.67
	Max	81,776.92	167,307.69	104,770.59	139,633.33
Aldrin	$\bar{x}$	623.74	845.82	901.24	1058.37
	SD	398.89	370.65	333.12	1,233.61
	Min	0.99	357.14	458.33	342.86
	Max	1,500.00	1,666.67	1,700.00	5,600.00
alpha-BHC	$\bar{x}$	769.91	989.23	1,001.65	1,185.85
	SD	583.13	389.38	374.07	1,390.85
	Min	1.10	513.33	500.00	376.19
	Max	2,300.00	1,833.33	1,900.00	6,300.00
alpha-Chlordane	$\bar{x}$	508.04	625.99	670.41	787.38
	SD	346.30	278.11	253.60	903.55
	Min	0.73	267.86	337.50	252.38
beta-BHC	$\bar{x}$	765.77	1,062.42	1,137.36	1,342.11
	SD	502.59	458.84	433.64	1,566.44
	Min	1.20	464.29	583.33	428.57

Constituent		Day-0	Day-7	Day-14	Day-19
	Max	1,900.00	2,083.33	2,200.00	7,100.00
cis-Nonachlor	$\bar{x}$	591.61	822.24	888.51	1,081.67
	SD	374.16	431.64	357.35	1,121.61
	Min	0.88	321.43	404.17	304.76
	Max	1,300.00	1,923.08	1,647.06	5,000.00
delta-BHC	$\bar{x}$	843.37	1,154.41	1,234.31	1,467.46
	SD	537.15	484.13	475.22	1,697.82
	Min	1.40	500.00	625.00	466.67
	Max	2,000.00	2,250.00	2,400.00	7,700.00
Dieldrin	$\bar{x}$	833.95	867.11	954.55	1,100.49
	SD	894.16	411.28	432.22	1,083.79
	Min	0.87	317.86	400.00	300.00
	Max	3,400.00	1,636.36	2,000.00	4,900.00
Endosulfan I	$\bar{x}$	481.63	665.76	716.02	843.45
	SD	316.29	285.37	269.69	992.60
	Min	0.79	289.29	362.50	271.43
	Max	1,200.00	1,333.33	1,400.00	4,500.00
Endosulfan II	$\bar{x}$	812.29	1,131.64	1,208.27	1,424.07

Constituent		Day-0	Day-7	Day-14	Day-19
	SD	529.68	481.22	449.28	1,652.16
	Min	1.30	500.00	625.00	457.14
	Max	2,000.00	2,166.67	2,300.00	7,500.00
Endosulfan sulfate	$\bar{x}$	1,332.95	1,835.26	1,982.15	2,343.59
	SD	878.35	789.49	739.57	2,710.13
	Min	2.20	785.71	1,000.00	761.90
	Max	3,300.00	3,583.33	3,800.00	12,300.00
Endrin	$\bar{x}$	609.80	845.82	901.24	1,058.37
	SD	398.51	370.65	333.12	1,233.61
	Min	0.99	357.14	458.33	342.86
	Max	1,500.00	1,666.67	1,700.00	5,600.00
Endrin aldehyde	$\bar{x}$	2,577.40	3,420.69	3,988.22	5,442.91
	SD	1,817.27	1,398.86	1,558.62	5,359.46
	Min	3.90	1,750.00	1,791.67	1,333.33
	Max	6,545.45	6,500.00	6,900.00	22,300.00
Endrin ketone	$\bar{x}$	1,000.77	1,382.50	1,489.08	1,751.37
	SD	657.84	595.09	562.64	2,027.47
	Min	1.60	607.14	750.00	571.43

Constituent		Day-0	Day-7	Day-14	Day-19
	Max	2,500.00	2,666.67	2,900.00	9,200.00
gamma-BHC (Lindane)	$\bar{x}$	558.87	659.07	686.04	811.13
	SD	527.35	323.51	278.46	900.77
	Min	0.73	267.86	337.50	252.38
	Max	2,300.00	1,294.12	1,300.00	4,100.00
gamma-Chlordane	$\bar{x}$	1,283.18	1,727.19	1,874.58	2,193.71
	SD	821.21	737.30	707.10	2,533.96
	Min	2.00	750.00	916.67	714.29
	Max	3,100.00	3,333.33	3,600.00	11,500.00
Heptachlor	$\bar{x}$	668.50	909.54	1,070.59	1,071.36
	SD	515.14	406.95	669.22	1,217.44
	Min	0.98	460.00	458.33	338.10
	Max	2,200.00	1,900.00	3,000.00	5,500.00
Heptachlor epoxide	$\bar{x}$	636.72	889.53	988.78	1143.90
	SD	421.47	376.16	419.61	1,304.11
	Min	1.00	392.86	458.33	361.90
	Max	1,600.00	1,750.00	1,900.00	5,900.00
Methoxychlor	$\bar{x}$	3,080.01	4,252.42	4,587.34	5,403.86

Constituent		Day-0	Day-7	Day-14	Day-19
	SD	2,013.58	1,833.33	1,718.48	6,258.00
	Min	5.00	1,821.43	2,291.67	1,714.29
	Max	7,600.00	8,333.33	8,800.00	28,400.00
Oxychlordane	$\bar{x}$	820.45	1163.31	1234.91	1499.27
	SD	518.45	525.05	458.68	1,551.61
	Min	1.20	464.29	583.33	423.81
	Max	1,900.00	2,307.69	2,200.00	7,000.00
Total Chlordane	$\bar{x}$	6,193.34	7,840.29	8,274.93	11,258.41
	SD	4,035.52	2,835.54	4,002.93	15,486.47
	Min	7.79	3,053.57	0.00	2,747.62
	Max	15,000.00	13,000.00	16,140.00	68,700.00
Toxaphene	$\bar{x}$	43785.38 A	55799.67 B	87162.99 B	72912.49 B
	SD	24,270.62	23,227.46	88,006.83	80,680.85
	Min	18,100.00	25,214.29	29,833.33	22,428.57
	Max	98,300.00	107,500.00	401,818.18	369,000.00
trans-Nonachlor	$\bar{x}$	855.90	1098.51	1094.03	1408.63
	SD	606.17	806.85	529.49	1,358.05
	Min	1.00	357.14	458.33	352.38

Constituent		Day-0	Day-7	Day-14	Day-19
totalOCP	Max	2,153.85	3,769.23	2,647.06	5,800.00
	$\bar{x}$	294902.65	372207.18	427176.98	494825.84
	SD	139,197.78	141,051.45	136,477.43	246,286.36
	Min	95,357.77	176,255.95	239,522.22	208,992.38
	Max	585,243.33	705,187.18	807,854.55	1,245,080.00

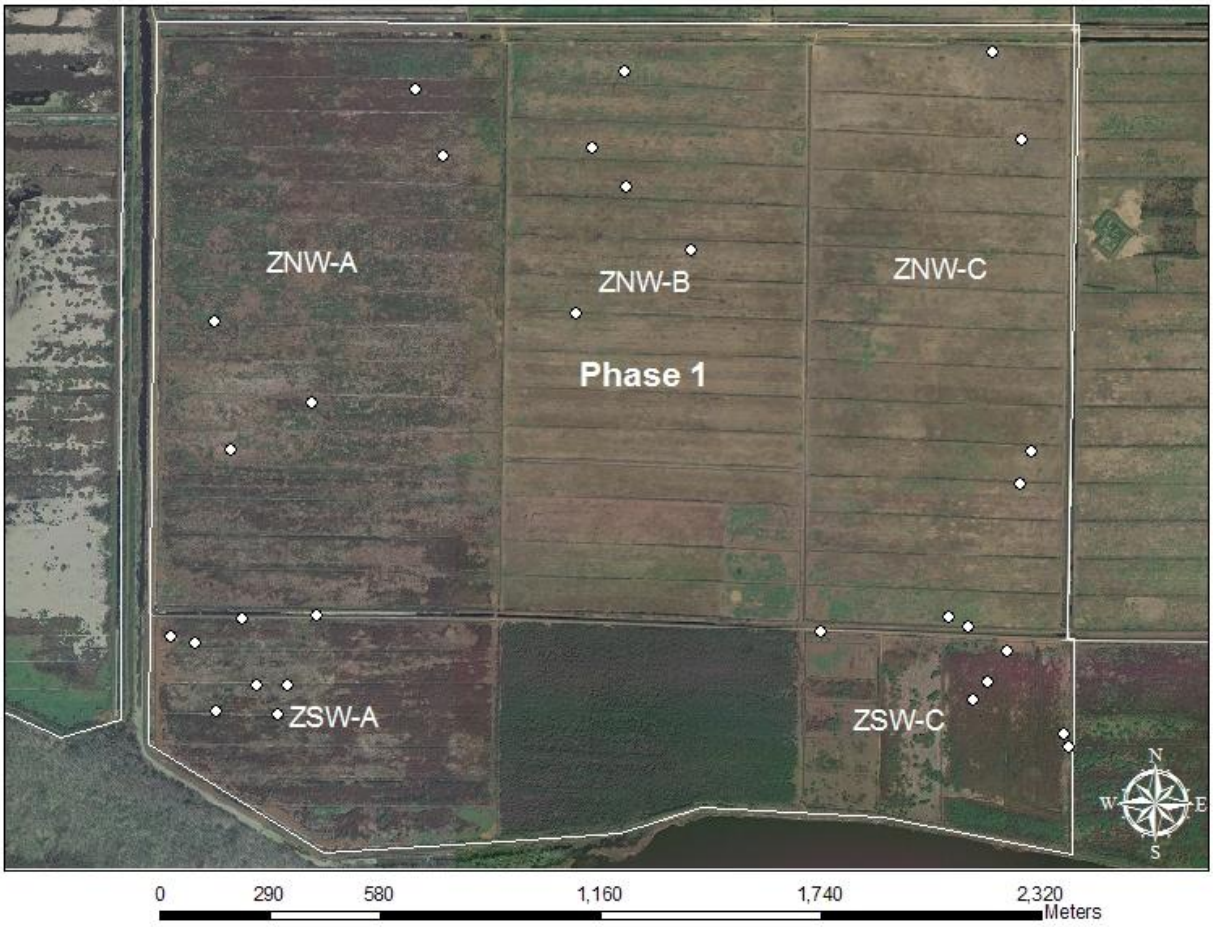

Figure 4.1. Locations where pig frogs were captured for OCP samples on Phase 1 of the NSRA of Lake Apopka in 2008.

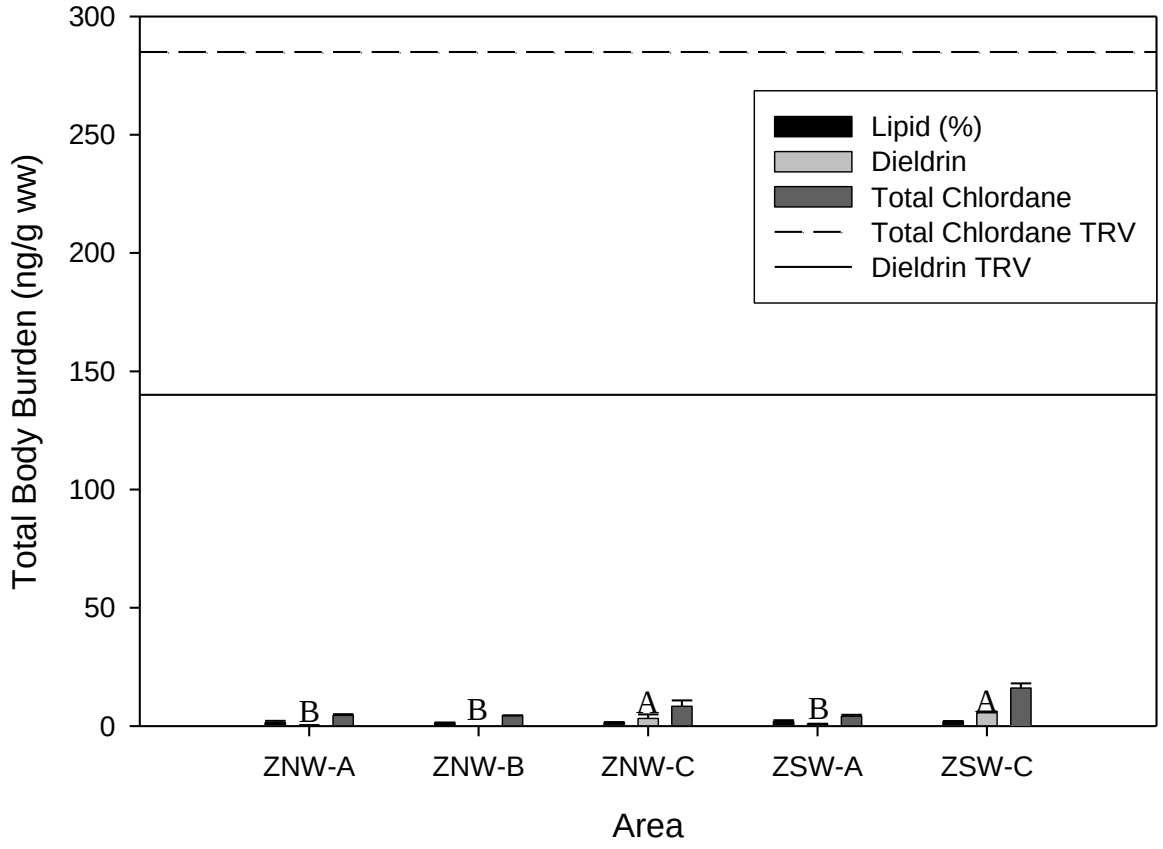

Figure 4.2. Concentrations (mean, SE) of dieldrin and total chlordane for pig frogs on Phase 1 of the North Shore Restoration Area of Lake Apopka. Fish toxicity reference values (TRV) shown on reference lines. Bars with different letters above them indicate significant differences ($P < 0.05$).

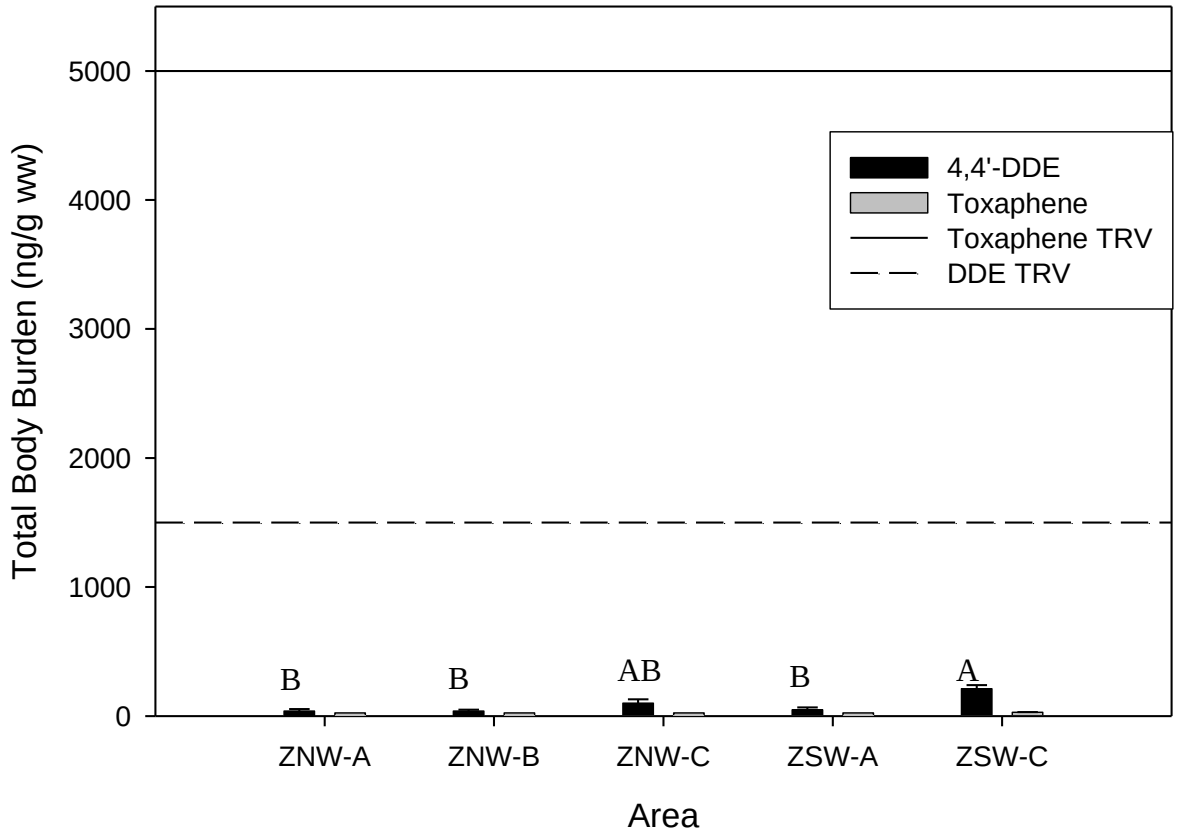

Figure 4.3. Concentrations of toxaphene and 4,4-DDE for pig frogs on Phase 1 of the North Shore Restoration Area of Lake Apopka. Fish toxicity reference values (TRV) shown on reference lines. Bars with different letters above them indicate significant differences ($P < 0.05$).

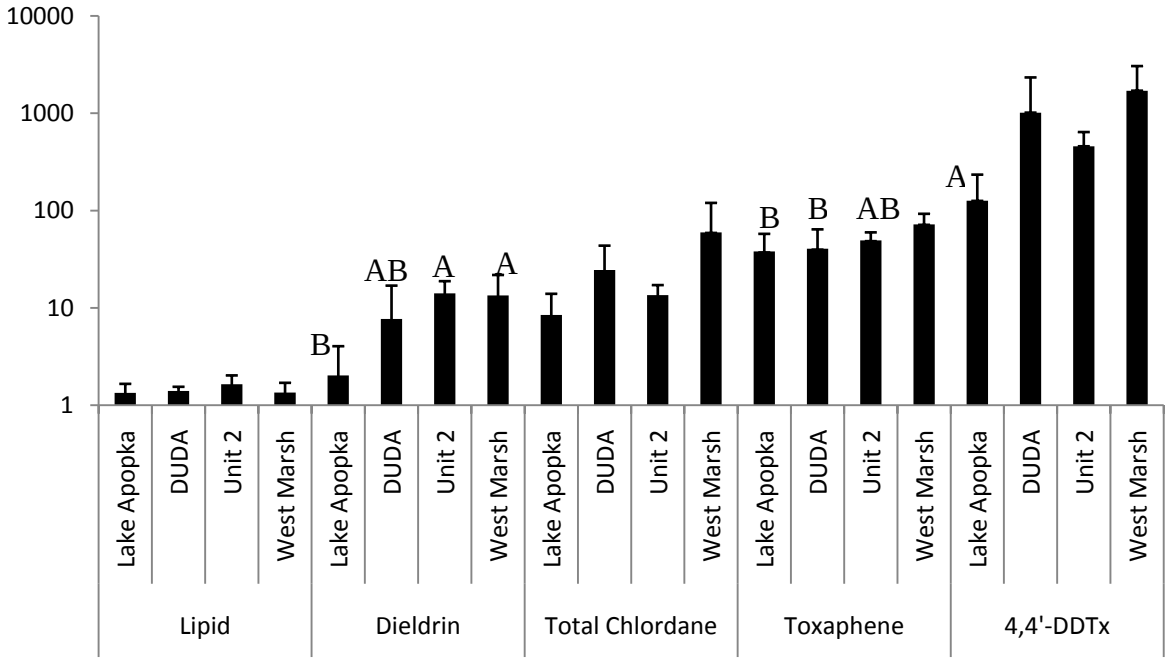

Figure 4.4. OCP concentrations (log scale; ng/g ww) in visceral organs and tail muscle composites of hatchlings collected during 2008 from NSRA units and Lake Apopka. Different letter indicate significant differences at $P < 0.05$. Phase 1 is represented by Unit2.

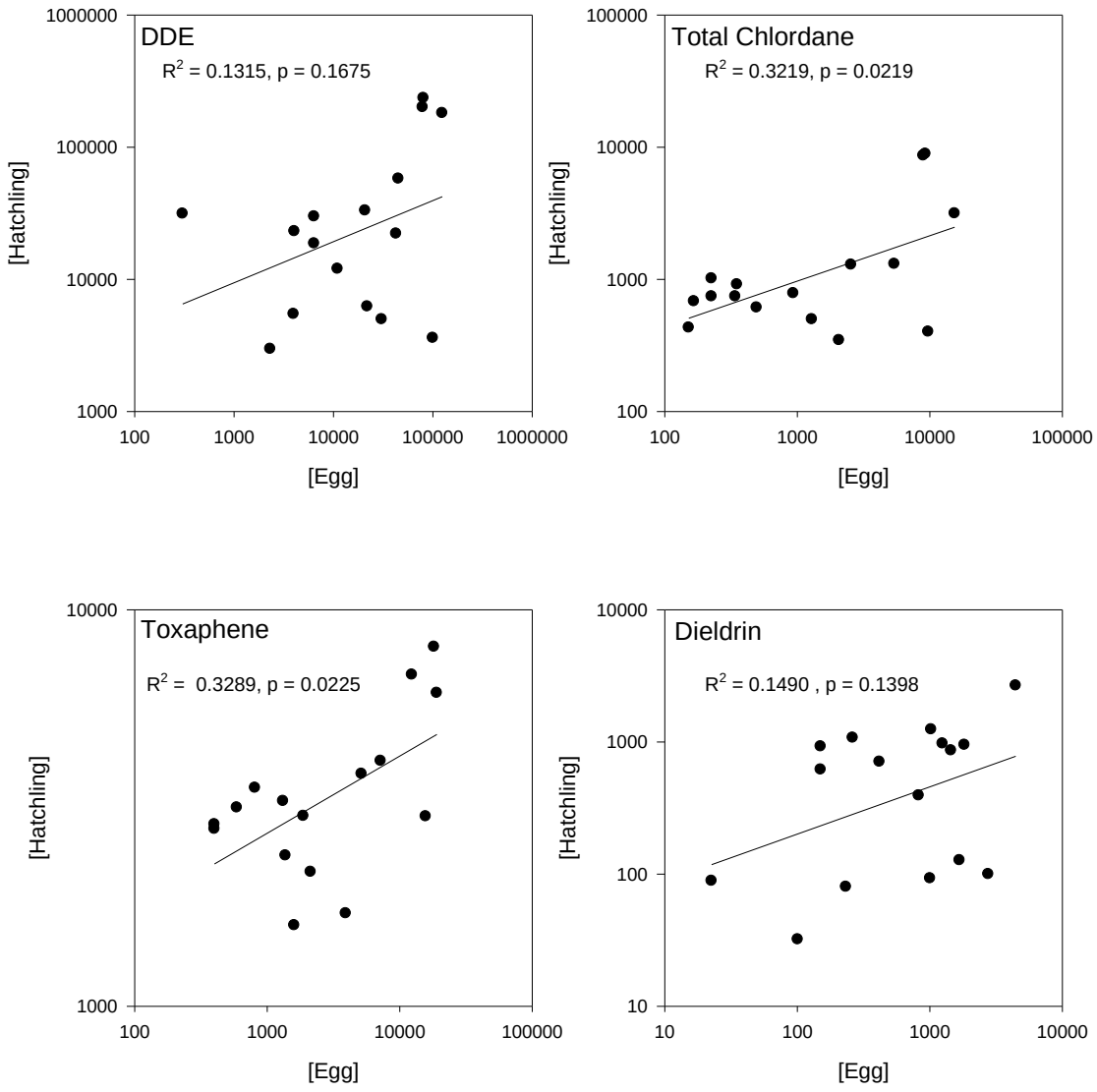

Figure 4.5. Association of lipid-adjusted OCP concentrations between alligator eggs and hatchlings from 16 clutches in (year). Please note axes are log scale.

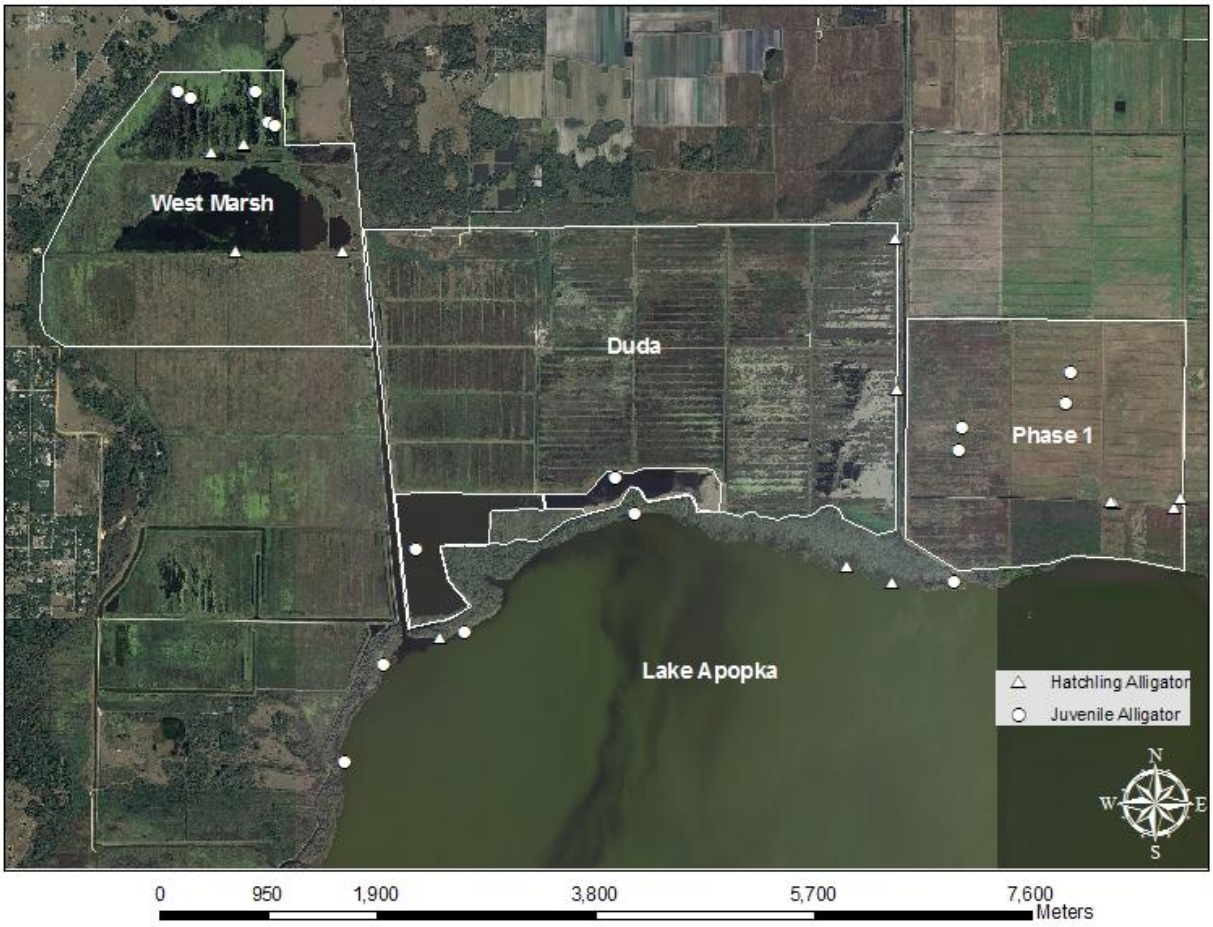

Figure 4.6. Locations where juvenile and hatchling alligators were caught for OCP samples on NSRA of Lake Apopka in 2008.

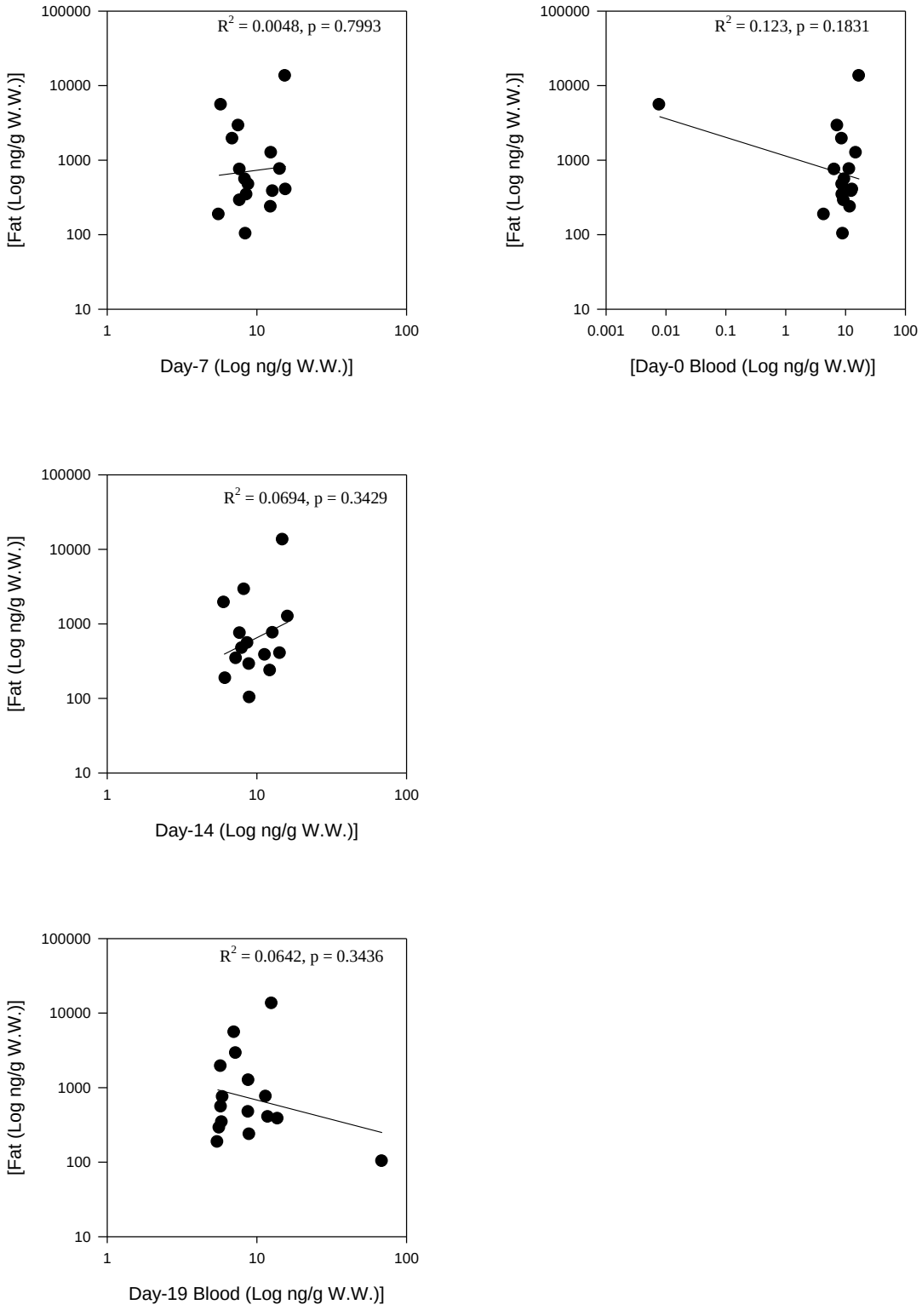

Figure 4.7. Linear regressions of total chlordane blood concentrations (log ng/g ww) and fat OCP concentrations (log ng/g ww) for various sampling times of fasted juvenile alligators.

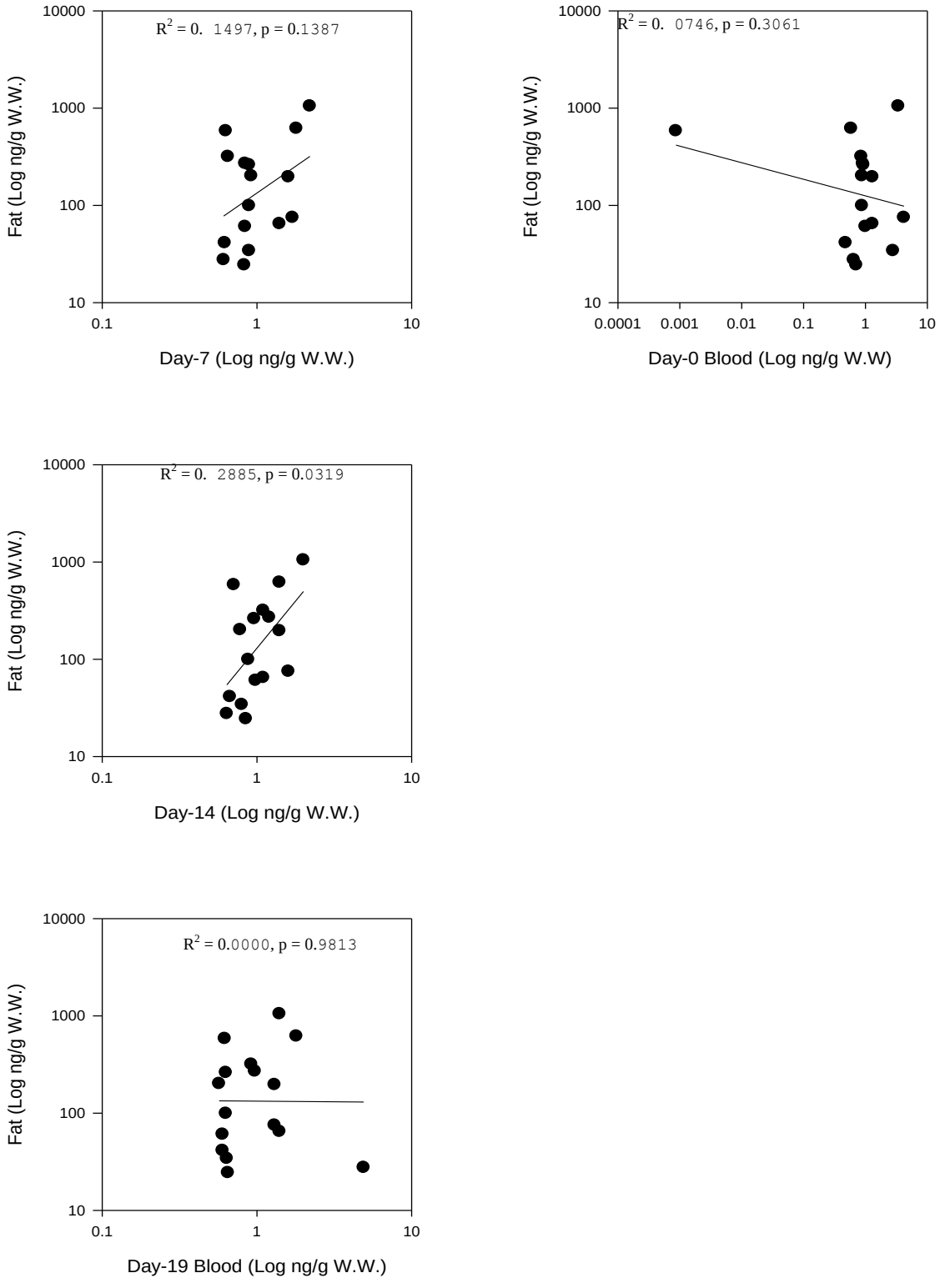

Figure 4.8. Linear regression of dieldrin blood concentrations (log ng/g ww) and fat OCP concentrations (log ng/g ww) for various sampling times of fasted juvenile alligators.

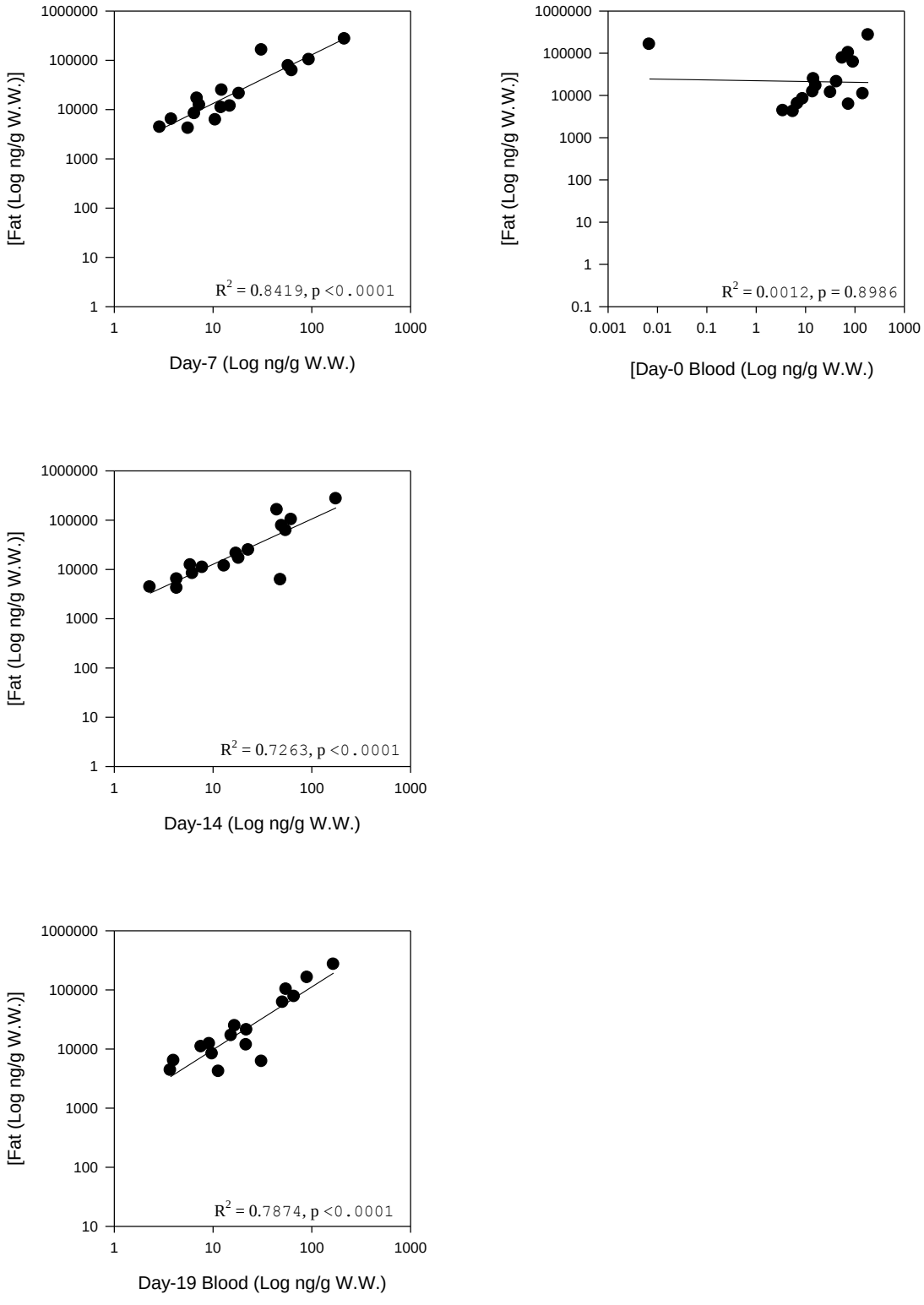

Figure 4.9. Linear regression of ‘-DDE blood concentrations (log ng/g ww) and fat OCP concentrations (log ng/g ww) for various sampling times of fasted juvenile alligators.

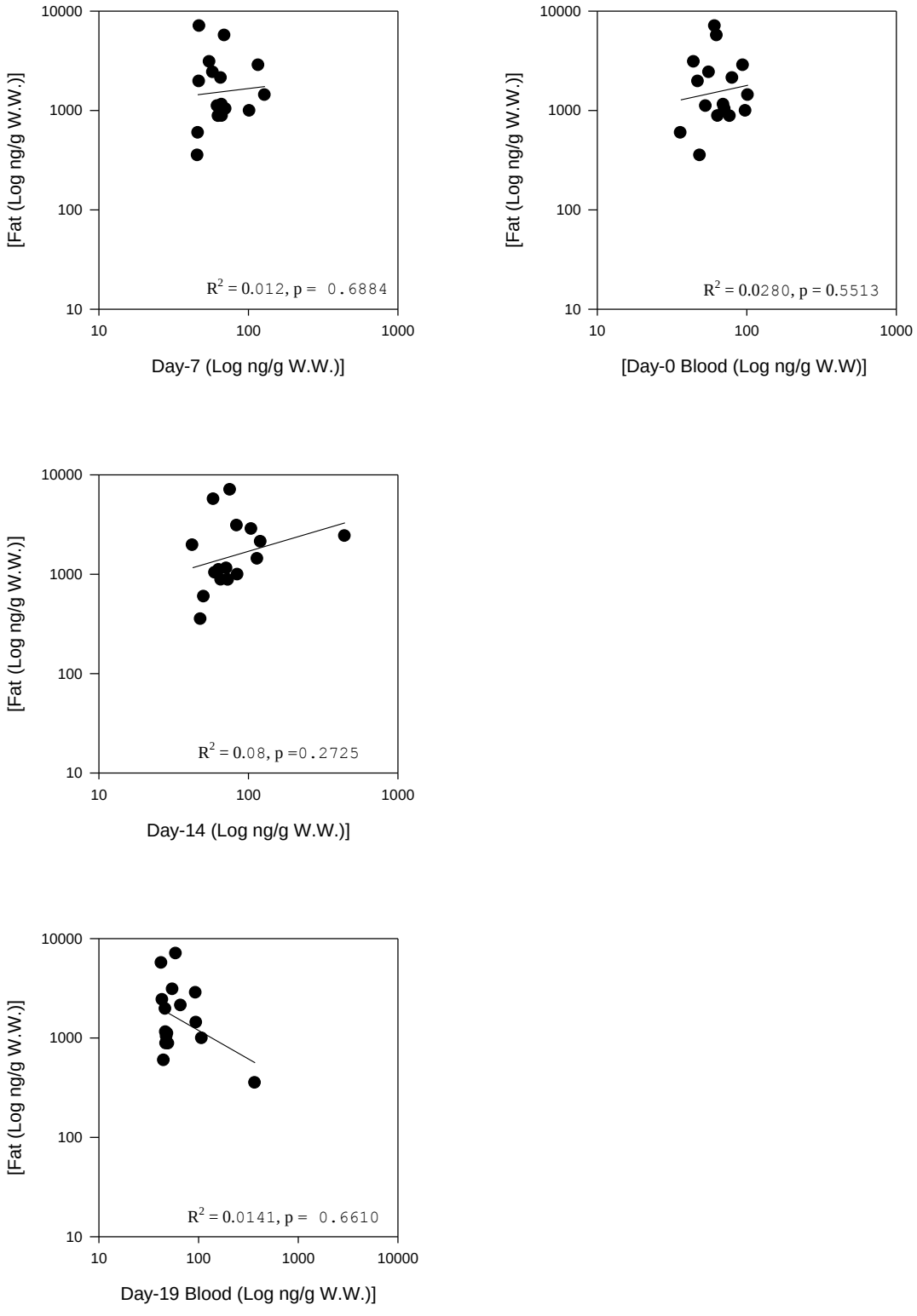

Figure 4.10. Linear regression of toxaphene blood concentrations (log ng/g ww) and fat OCP concentrations (log ng/g ww) for various sampling times of fasted juvenile alligators.

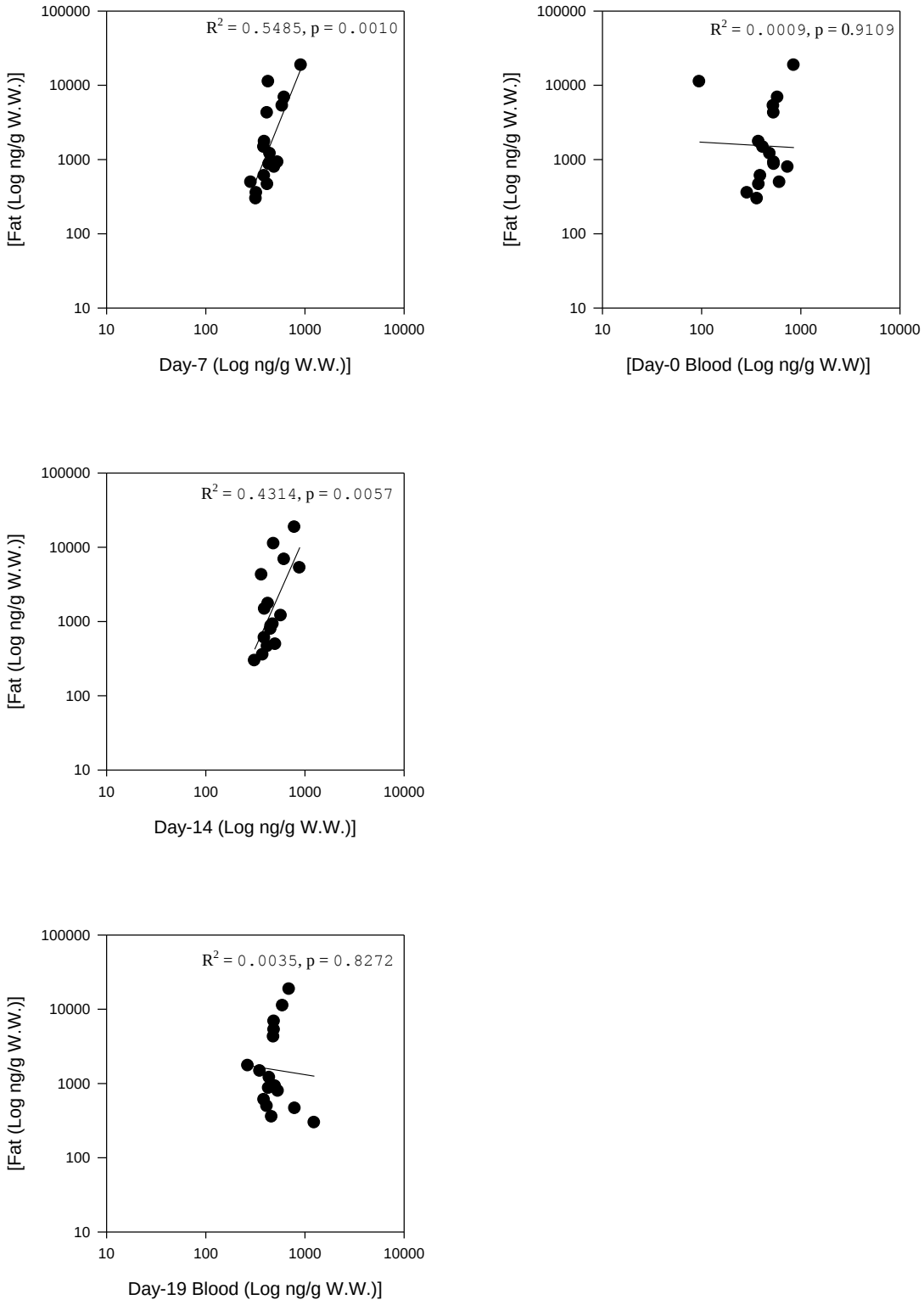

Figure 4.11. Linear regression of total OCP blood concentrations (log ng/g ww) and fat OCP concentrations (log ng/g ww) for various sampling times of fasted juvenile alligators.

CHAPTER 5
ORGANOCHLORINE PESTICIDES IN BLOOD OF JUVENILE ALLIGATORS

INTRODUCTION

In 2007, a pilot study was initiated by the Florida Cooperative Fish and Wildlife Research Unit (FCFWRU) to examine alternative monitoring strategies for OCP accumulation within selected impoundments of the NSRA using American alligators. Alligators may be susceptible to bioaccumulation of contaminants found in wetlands (Delany et al. 1988, Khan and Tansel 2000, Rumbold et al. 2002), due to their long lives and high trophic level (Delany and Abercrombie 1986, Ogden et al. 1974). Because of this, and their relatively small home range (Goodwin and Marion 1979), they may be a useful environmental indicator of OCPs (Campbell 2003, Raushenberger et al 2004, Milnes and Guillette 2008). Hatch rate and hatchling survival can reflect ecosystem health because adult female alligators tend to have strong site fidelity (Joanen and McNease 1970, Goodwin and Marion 1979) and feed in well defined areas compared to wading birds (Rootes and Chabreck 1993). Alligators lay eggs and have easily identifiable nests, which also enhances their suitability as surrogates for wading birds.

In 2007, we also examined the health of the amphibian population on the NSRA as another method of OCP monitoring. Research has shown that amphibians may transmit OCPs to their offspring through eggs, and that they are susceptible to other types of sub-lethal effects that may impact survival and reproduction (Hayes et al. 2006, Hopkins et al. 2006). Anurans may be particularly good indicators of ecosystem health because they readily absorb contaminants through their integument and gastrointestinal tract (Collins and Storfer 2003).

The 2007 pilot study evaluated hatch rates and OCP concentrations in eggs of alligators from the NSRA and Lake Apopka, and OCP concentrations in tissues of juvenile alligators and pig frogs. Hatch rates and OCP concentrations in eggs were evaluated to provide baseline information on reproductive success and exposure, which could be compared to the historic data sets for Lake Apopka. OCP concentrations in juveniles were evaluated to determine the level of exposure and the amount of tissue needed for analytical chemistry, and whether individuals from different areas had different tissue concentrations, indicative of differing exposure. OCPs were evaluated in pig frogs to evaluate the risk to piscivorous birds that may consume the frogs and to evaluate if OCP concentrations in frogs differed among areas.

Results of the 2007 study showed that OCP concentrations found in NSRA eggs were significantly higher than the levels in Lake Apopka eggs, no differences were detected in hatch rates between the areas, and hatch rates were above normal compared to other areas in Florida. For juvenile alligators, OCP concentrations in tissues varied among impoundments, which suggested they may reflect OCP levels in their habitats and be a potential monitoring tool. In addition, we found that collecting enough tissue for OCP analyses would pose a severe risk to the health of the juvenile and that other means of sampling should be investigated to conduct repeated sampling on individuals.

During the 2007 study, pig frogs were collected from the NSRA's three study units and Lake Apopka to measure their OCP concentrations and evaluate the risk to birds that may forage on the frogs. Because Phase 1 was not flooded, all samples in that unit came from the ditch along Roach Road. In 2007, pig frogs sampled for OCPs had significantly higher concentrations of DDE and oxychlordane in the NSRA compared to Lake Apopka. However, none of the levels

posed a health risk to fish-eating birds, and OCP levels were lower than concentrations found in fish from their respective areas (Appendix A).

Based on the findings of the 2007 pilot study, we conducted a study in 2008 that evaluated 1) OCP concentrations in pig frogs from the recently flooded Phase 1 area; 2) bioaccumulation in hatchlings from the clutches that were collected in 2007; and 3) the potential use of blood as an indicator of body burdens of juvenile alligators. Findings of the 2008 pig frog study indicated that 1) OCP concentrations in pig frogs varied among areas within Phase 1, 2) that OCP concentrations were lower than fish from that area because frogs had lower lipid levels, and 3) the low OCP concentrations in frogs indicated that birds could safely consume frogs from the NSRA. Findings of the 2008 hatchling alligator study indicated 1) that for the most part hatchlings from clutches with elevated OCP concentrations maintained elevated concentrations relative to hatchlings from clutches with lower concentrations, 2) hatchling alligators from the West Marsh had higher OCP concentrations that those from other areas, and 3) the higher concentrations would not pose a risk for eggshell thinning in predatory birds unless 100% of the birds diet was West Marsh alligator hatchlings. The 2008 study evaluating the relationship between OCP concentrations in blood and tissues of juvenile alligators indicated that fasting alligators for seven days improved the ability to use blood concentrations as an indicator of body burdens.

Because blood samples are a noninvasive way of monitoring OCP concentrations in juvenile alligators, the 2009 study's goal was to further evaluate the utility of using juvenile alligators as an area-specific OCP monitoring tool by evaluating the relationship between home range of juvenile alligators and OCP concentrations in blood.

METHODS

Juvenile alligator study evaluating OCP concentrations in blood and home range and movements

In the 2009, juvenile alligators were captured from Lake Apopka, Duda, West Marsh, and Phase 1 (Appendix F). Alligators were fasted for 7 days and blood samples were collected and analyzed using the same methods as in Appendix H. These alligators were fitted with radio transmitters, released at their original capture site, and tracked (see Chapter 3).

Using the minimum detection limit (MDL) as a substitute when the laboratory report indicates a nondetect (ND) can artificially skew the distribution of values. Therefore, we compared the reported laboratory results (which substituted MDL for ND) to the instrument output (IOP) provided by Pace Laboratory, which is a real number given by the instrument, to assess whether it would be an appropriate measure to use. Pairwise comparisons were conducted using a t-test (PROC TTEST, SAS 9.1) to see if reported laboratory results differed from IOP for each analyte. A comparison of distributions and differences between MDL-substituted values and IOP values indicated that using IOP values for subsequent analyses would be appropriate.

Comparisons of OCP concentrations (lipid-adjusted, log-transformed) in blood of juvenile alligators among the four areas (Lake Apopka, Duda, Phase 1, West Marsh) were conducted using a general linear model (PROC GLM; SAS 9.1) followed by Tukey's multiple comparison procedure using lipid-adjusted, log-transformed OCP concentrations.

Differences between genders were evaluated using a t-test (PROC TTEST, SAS 9.1) to compare lipid-adjusted, log-transformed blood concentrations of lipid, dieldrin, total chlordane,

4,4’-DDE, and toxaphene. Differences between “move” and “not move” categories were conducted as described above to evaluate whether alligators that moved out of a start unit had differing OCP blood concentrations to those that did not move out of their start unit. These comparisons were made for each unit separately because OCPs concentrations varied among units.

The association of Minimum Convex Polygon (MCP), home range estimates (core, primary, and total), and movements with OCP blood concentrations (lipid-adjusted and log-transformed) for each area was evaluated using regression analysis (PROC REG, SAS 9.1). Lipids, dieldrin, total chlordane, 4,4’-DDE, and toxaphene were the OCP constituents of concern.

RESULTS

Juvenile alligator study evaluating OCP concentrations in blood (2008-2009)

A total of 74 alligators were captured with the greatest numbers of samples collected from Lake Apopka (23) and Phase 1 (22), followed by West Marsh (19) and Duda (10). Overall, average TL and mass of alligators in this analysis were 108.5 cm and 3559 g (Table 5.1).

Total length and mass were similar across sites because individuals in the 90-120 cm size category were purposely selected. Lake Apopka alligators were slightly greater in average total length (112.9 cm) than alligators from other areas, and alligators from the West Marsh were slightly smaller (100.0 cm) than alligators from other units (Table 5.1). Average mass of individuals from Phase 1 (4,020 g) was slightly greater than those of the other sites and average mass of alligators from West Marsh (2,690 g) was slightly less than alligators from the other sites (Table 5.1).

In every case, except for 4,4’-DDE, the laboratory-reported result was significantly greater ($P < 0.01$) than the IOP (Table 5.2). For endrin, the mean laboratory results was 1,700 times greater than the IOP, but that is probably because endrin is so rarely detected.

Comparisons of OCP concentrations in blood of alligators ($n = 74$) among sites indicated that individuals from West Marsh had higher ($P < 0.05$) levels of 4,4’-DDE than the those from other areas (Table 5.3). Differences were also detected among Phase 1, Lake Apopka, and Duda for dieldrin, total chlordane, and toxaphene. For dieldrin, Phase 1 alligators had higher blood concentrations ($P < 0.05$) compared to those from Lake Apopka and Duda. For total chlordane, Duda alligators had blood concentrations that were less ($P < 0.05$) than those from the other areas. West Marsh alligators had higher concentrations of toxaphene compared to Duda and Phase 1(Table 5.3).

The maximum 4,4’-DDE blood concentration (130 ng/g) was for an individual alligator the West Marsh (Table 5.3). The minimum 4,4’-DDE blood concentration of 4.1 ng/g came from an individual from Lake Apopka (Table 5.3). For toxaphene, the maximum blood concentration was 116.0 ng/g and was measured in a West Marsh alligator, whereas a minimum of 8.7 ng/g, was measured in a Lake Apopka alligator (Table 5.3). No significant differences were detected among sites for the next two important OCP groups, dieldrin and total chlordane. Individuals from Lake Apopka and Phase 1 had the single highest dieldrin and total chlordane of 7.3 ng/g and 1.6 ng/g, respectively (Table 5.3).

Juvenile alligator study evaluating OCP concentrations in blood and home range and movements (2008-2009)

OCP blood concentration data and telemetry data were available for 40 juvenile alligators. Samples were distributed among the areas and included Lake Apopka (n = 8), Duda (n = 7), Phase 1 (n = 12), and West Marsh (n = 13). Blood concentrations of 4,4'-DDE in West Marsh alligators were three to four times greater than those of other units ($P \leq 0.005$). Blood concentrations of toxaphene in West Marsh alligators were two-fold greater than concentrations in Duda (P = 0.016). No significant differences ($P > 0.05$) were found among start units for blood concentrations of lipid, dieldrin, or total chlordane (Table 5.4).

Lipid concentrations in male alligators from Duda were higher than females (P = 0.04). No other significant differences were found between males and females for the other variables (Table 5.5).

Alligators that moved from their original start unit (move) were compared to those that did not move. For the lake, 7 of 8 alligators moved compared to Duda (2 of 7), West Marsh (2 of 11), and Phase 1 (0 of 12). No significant differences in blood OCPs were found between alligators that moved from a given start unit and those that did not move. However, lipid concentrations in blood of alligators that moved from Lake Apopka were lower (than those that did not move (Table 5.6). No significant differences were found between the number of core areas and lipid or OCP concentrations in blood of juvenile alligators captured during 2008 and 2009 (Table 5.7).

MCP and concentrations of lipid and OCPs in blood were not significantly associated with each other, with the exception of dieldrin for Lake Apopka alligators (Fig 5.1). For individuals that were initially captured in Lake Apopka, results suggest that concentrations of dieldrin in blood increased as MCP increased. A possible explanation is that animals had been moving into areas within the NSRA that had prey with higher levels of dieldrin. Primary and total home range estiamtes were not significantly associated ($P > 0.05$) with concentrations of lipid and OCPs in blood. For Lake Apopka, core home range estimates were negatively associated (P = 0.05) with total chlordane levels (Fig 5.2). Results suggest that as home range increases, total chlordane level in blood decreases. Raw data for all OCP analysis can be found in Appendix G.

DISCUSSION

Juvenile alligator study evaluating OCP concentrations in blood (2008-2009)

For the OCPs of major concern, the reported laboratory results were very similar to the IOP for 4.4'DDE and toxaphene, 2.4 times greater for dieldrin, and 25.5 times greater for total chlordane. In summary, reported laboratory results and IOP are consistent for analytes that are commonly measured above the LOD. However, for those that are less commonly measured above the LOD, the difference can be considerable. Although the mean values were different, the outcomes (significant vs. nonsignificant determinations) of using IOP concentrations to compare dieldrin, total chlordane, toxaphene, and 4,4'-DDE blood levels among levels were consistent with outcomes when reported laboratory results were used in the analysis. Therefore, we considered IOP as an appropriate value in further analyses.

Comparisons of OCP concentrations in blood of alligators differed among areas (Table 5.3). We suggest several plausible reasons for the observed differences, including different OCP concentrations in sediments and in their diet, different endogenous burdens from yolk, and different exposure time since alligators within units were less likely to move from their capture and release location compared to those from Lake Apopka . The similarity in OCP levels in Lake Apopka alligators and alligators from Phase 1 and Duda may be due to movement of animals into and out of the areas and/or similar OCP levels in prey items. The higher OCPs in sediments were likely due to historic land use.

Juvenile alligator study evaluating OCP concentrations in blood and home range and movements (2008-2009)

The finding that alligators originally captured in Lake Apopka were more likely to move compared to animals captured from other areas suggests that habitats within the NSRA are suitable for supporting juvenile alligator populations. Furthermore, the probability of alligators staying in the newly flooded restoration areas suggests that alligators captured within the restoration areas may be used as a tool for monitor OCP exposure in wildlife in those areas.

It is important to remember that all blood samples were collected at the time tracking devices were initially placed on alligators. So, it was necessary to assume that pre-capture movement patterns were similar to pos-capture movement patterns, in order to draw any inferences about the relationship between OCP blood concentrations and home range.

The lack of differences between alligators that moved from their units of capture (start units) to animals that did not move from their start units may be related to low sample numbers alligators that for moved and not moved categories within each area. If we had been able to recapture and collect samples on these alligators a year after they moved, then we may have been able to detect differences in OCP concentrations, because they would have had time to bioaccumulate OCPs from the new area.

The lipid concentrations in blood of alligators that moved from Lake Apopka were statistically lower than those that did not move and may suggest that these lake animals have been under stress, because blood on all animals was collected after a seven day fast and blood lipids would not have been affected by recently consumed prey. Again, only one animal was available that did not move from Lake Apopka to the NSRA (Table 5.6).

No significant differences were found between the number of core areas and lipid or selected OCP concentrations in blood of juvenile alligators captured during 2008 and 2009 (Table 5.7), which suggests OCP concentrations did not differ among the core areas. However, sample size was low for this test, so tests may not have had the power to detect real differences.

For individuals that were initially captured in Lake Apopka, results suggest that concentrations of dieldrin in blood increased as MCP increased (Fig. 5.1). A possible explanation is that alligators with larger MCPs had (for some period of time prior to sampling and tracking) been using areas within the NSRA that had prey with higher levels of dieldrin.

Primary and total home range estimates were not significantly associated with concentrations of lipid and OCPs in blood in individuals from any of the areas. For core home range estimates, Lake Apopka alligators' OCP blood concentrations were significantly and negatively associated with total chlordane levels (Fig 5.2). Because the home range estimates increased in size from core to total home range, the increased variation may explain why significant associations were found for core home range, but not the others. Animals with larger

core home range estimates from Lake Apopka may already have been spending considerable time foraging in areas with lower levels of total chlordane.

In summary, we conclude that juvenile alligators will move from Lake Apopka into newly flooded restoration units. Furthermore we conclude that once an alligator has moved into a newly flooded area, there is a high probability that juvenile alligators will remain in that area and that the post-fasting OCP concentrations in their blood will be reflective of the OCP levels in their local environment. We suggest future studies may show that large numbers of juveniles could be captured, blood sampled, and tagged prior to flooding new units. Surveys and blood sampling should then be conducted during the flooding and post-flooding to monitor the immigration of alligators and the bioaccumulation of OCPs.

Table 5.1. Size (cm) and mass (g) of juvenile alligators captured and sampled during 2008 and 2009 on Lake Apopka and North Shore Restoration Area units. NC = no individuals captured.

		2008		2009		Overall	
Collection area	**Data**	**(*n*) $\bar{x}$**	**SD**	**(*n*) $\bar{x}$**	**SD**	**(*n*) $\bar{x}$**	**SD**
Duda	TL	(4) 112.4	16.9	(6) 107.4	13.8	(10) 109.4	14.4
	SVL	55.1	8.1	53.5	8	54.2	7.6
	HL	15.1	2.1	NC	NC	15.1	2.1
	TG	24.1	5.3	NC	NC	24.1	5.3
	Mass	4212.5	2359.5	3591.7	1764.2	3840	1920.3
Lake Apopka	TL	(4) 121.1	24.1	(19) 111.6	13.2	(23) 112.9	14.7
	SVL	60.7	13.9	55.7	6.6	56.4	7.7
	HL	14.1	1.9	14.3	0.7	14.2	1.1
	TG	24.8	5.4	23.5	3	23.9	3.6
	Mass	3325	1308.1	3776.6	1480.7	3733.6	1441.3
Phase 1	TL	(17) 110.8	14.2	(5) 111.5	2.8	(22) 111.0	12.5
	SVL	54.7	7.1	56	2.5	55	6.3
	HL	14.9	2	NC	NC	14.9	2
	TG	22.6	3.3	NC	NC	22.6	3.3
	Mass	4040	2067.4	3948	435.6	4019.1	1815
West Marsh	TL	(17) 100.4	7.5	(2) 96.0	0.8	(19) 100.0	7.2
	SVL	48.9	3.9	46.2	1.7	48.6	3.7
	HL	13.5	1	13	0.6	13.4	1
	TG	20.5	1.7	19.2	0.2	20.4	1.7
	Mass	2713.8	670.5	2450	70.7	2686.1	637.8
Overall	TL	(41) 107.4	14	(32) 109.8	12.2	(74) 108.5	13.2
	SVL	52.7	7.3	54.7	6.5	53.6	7
	HL	14.3	1.7	13.7	0.9	14.2	1.7
	TG	22.1	3.3	22.7	3.2	22.2	3.3
	Mass	3457.9	1690.7	3685.8	1384.2	3559.2	1555.5

Table 5.2. Comparisons of reported laboratory results (R) to instrument output (IOP) results for OCPs measured in blood of juvenile alligators(n = 73) collected in Lake Apopka and the NSRA during 2008 and 2009. Except for 4,4'-DDE, R was greater than IOP for all constituents (P < 0.01).

Constituent	Data	$\bar{x}$	R/ IOP factor	Constituent	Data	$\bar{x}$	R/ IOP factor
4,4'-DDD	Result	1.443	6.0	Endosulfan sulfate	Result	1.628	34.6
	IOP	0.242			IOP	0.047	
4,4'-DDE	Result	28.646	1.0	Endrin	Result	3.403	1701.5
	IOP	28.646			IOP	0.002	
4,4'-DDT	Result	1.082	3.4	Endrin aldehyde	Result	3.177	3.4
	IOP	0.322			IOP	0.942	
4,4'-DDTr	Result	3.280	10.2	Endrin ketone	Result	1.464	2.8
	IOP	0.322			IOP	0.531	
4,4'-DDTx	Result	31.17	96.8	gamma-BHC (Lindane)	Result	0.942	3.6
	IOP	0.322			IOP	0.260	
Aldrin	Result	1.700	5.9	gamma-Chlordane	Result	1.285	2.5
	IOP	0.288			IOP	0.511	
alpha-BHC	Result	2.209	1.1	Heptachlor	Result	0.985	4.1
	IOP	2.052			IOP	0.240	
alpha-Chlordane	Result	0.867	2.0	Heptachlor epoxide	Result	1.845	6.7
	IOP	0.425			IOP	0.275	
beta-BHC	Result	4.154	1.2	Lipid	Result	0.131	1.1
	IOP	3.540			IOP	0.124	
cis-Nonachlor	Result	0.959	2.3	Methoxychlor	Result	9.146	73.8
	IOP	0.422			IOP	0.124	
Decachlorobiphenyl (S)	Result	87.953	1.5	Oxychlordane	Result	0.941	1.5
	IOP	58.169			IOP	0.633	
delta-BHC	Result	2.046	8.0	Tetrachloro-m-xylene (S)	Result	85.142	1.5
	IOP	0.257			IOP	56.570	
Dieldrin	Result	3.620	2.4	Total Chlordane	Result	8.195	25.5
	IOP	1.512			IOP	0.322	
Endosulfan I	Result	0.980	61.3	Toxaphene	Result	45.505	1.1
	IOP	0.016			IOP	39.765	
Endosulfan II	Result	0.904	16.7	trans-Nonachlor	Result	1.313	1.4
	IOP	0.054			IOP	0.930	

Table 5.3. Lipid and organochlorine pesticide concentrations in blood of juvenile alligators captured in Lake Apopka and the NSRA during 2008 and 2009. Different letters indicate differences between areas ($P < 0.05$).

Constituent	Lake	Duda	Phase 1	West Marsh	Overall
Lipid					
N	**23**	**10**	**22**	**19**	**74**
$\bar{x}$	0.11	0.14	0.13	0.12	0.12
SD	0.04	0.04	0.04	0.04	0.04
min.	0.06	0.06	0.06	0.07	0.06
max.	0.19	0.18	0.23	0.20	0.23
4,4'-DDE					
$\bar{x}$	15.07 B	19.88 B	16.78 B	63.42 A	28.65
SD	15.59	17.52	7.88	34.55	29.14
min.	4.10	6.20	6.40	19.80	4.10
max.	74.10	67.00	35.50	130.00	130.00
Dieldrin					
$\bar{x}$	1.34 A	0.81 A	1.87 B	1.68 AB	1.51
SD	1.94	0.68	1.14	1.23	1.44
min.	0.00	0.07	0.72	0.20	0.00
max.	7.30	2.60	4.70	4.40	7.30
Total Chlordane					
$\bar{x}$	0.32 A	0.21 B	0.37 A	0.32 A	0.32
SD	0.15	0.16	0.30	0.23	0.23
min.	0.00	0.00	0.10	0.00	0.00
max.	0.53	0.56	1.60	0.92	1.60
Toxaphene					
$\bar{x}$	34.92 AB	27.05 B	31.09 B	62.37 A	39.76
SD	23.46	14.27	19.50	26.89	25.76
min.	8.70	11.70	13.00	17.10	8.70
max.	90.40	47.70	101.00	116.00	116.00
4,4'-DDT					
$\bar{x}$	0.32	0.21	0.37	0.32	0.32
SD	0.15	0.16	0.30	0.23	0.23
min.	0.00	0.00	0.10	0.00	0.00
max.	0.53	0.56	1.60	0.92	1.60
4,4'-DDTr					
$\bar{x}$	0.32	0.21	0.37	0.32	0.32
SD	0.15	0.16	0.30	0.23	0.23
min.	0.00	0.00	0.10	0.00	0.00
max.	0.53	0.56	1.60	0.92	1.60
4,4'-DDTx					
$\bar{x}$	0.32	0.21	0.37	0.32	0.32
SD	0.15	0.16	0.30	0.23	0.23
min.	0.00	0.00	0.10	0.00	0.00
max.	0.53	0.56	1.60	0.92	1.60
4,4'-DDD					
$\bar{x}$	0.13	0.21	0.16	0.49	0.24
SD	0.10	0.16	0.12	0.64	0.36
min.	0.00	0.00	0.00	0.00	0.00
max.	0.37	0.45	0.48	2.70	2.70

Constituent	Lake	Duda	Phase 1	West Marsh	Overall
Aldrin					
$\bar{x}$	0.24	0.20	0.24	0.44	0.29
SD	0.16	0.24	0.15	0.24	0.21
min.	0.00	0.00	0.00	0.14	0.00
max.	0.65	0.77	0.49	0.89	0.89
alpha-BHC					
$\bar{x}$	1.81	0.94	2.40	2.52	2.05
SD	1.30	1.07	1.59	0.71	1.34
min.	0.00	0.00	0.00	1.70	0.00
max.	4.20	2.70	7.80	4.50	7.80
alpha-Chlordane					
$\bar{x}$	0.29	0.50	0.39	0.59	0.43
SD	0.24	0.28	0.25	0.48	0.34
min.	0.00	0.00	0.00	0.00	0.00
max.	0.86	1.00	0.99	1.90	1.90
beta-BHC					
$\bar{x}$	4.69	1.53	5.46	0.99	3.54
SD	4.61	2.82	3.77	0.72	3.92
min.	0.00	0.00	0.00	0.00	0.00
max.	13.30	9.10	13.60	2.70	13.60
cis-Nonachlor					
$\bar{x}$	0.39	0.39	0.33	0.58	0.42
SD	0.21	0.35	0.18	0.29	0.26
min.	0.14	0.07	0.07	0.20	0.07
max.	0.85	1.30	0.79	1.40	1.40
delta-BHC					
$\bar{x}$	0.02	0.34	0.68	0.02	0.26
SD	0.09	0.47	1.98	0.07	1.12
min.	0.00	0.00	0.00	0.00	0.00
max.	0.42	1.20	9.30	0.29	9.30
Endosulfan I					
$\bar{x}$	0.02	0.01	0.03	0.00	0.02
SD	0.08	0.02	0.08	0.00	0.06
min.	0.00	0.00	0.00	0.00	0.00
max.	0.33	0.07	0.35	0.00	0.35
Endosulfan II					
$\bar{x}$	0.04	0.19	0.03	0.04	0.05
SD	0.09	0.40	0.04	0.06	0.16
min.	0.00	0.00	0.00	0.00	0.00
max.	0.37	1.30	0.13	0.22	1.30
Endosulfan sulfate					
$\bar{x}$	0.05	0.09	0.02	0.05	0.05
SD	0.08	0.18	0.03	0.07	0.09
min.	0.00	0.00	0.00	0.00	0.00
max.	0.28	0.60	0.10	0.22	0.60
Endrin					
$\bar{x}$	0.00	0.00	0.01	0.00	0.00
SD	0.00	0.00	0.03	0.00	0.02
min.	0.00	0.00	0.00	0.00	0.00

Constituent	Lake	Duda	Phase 1	West Marsh	Overall
max.	0.00	0.00	0.15	0.00	0.15
Endrin aldehyde					
$\bar{x}$	1.12	0.38	0.69	1.32	0.94
SD	0.95	0.46	1.04	1.38	1.09
min.	0.00	0.00	0.00	0.00	0.00
max.	3.10	1.50	3.30	5.70	5.70
Endrin ketone					
$\bar{x}$	0.45	0.58	0.49	0.64	0.53
SD	0.34	0.42	0.40	0.27	0.35
min.	0.00	0.05	0.00	0.13	0.00
max.	1.20	1.60	1.60	1.10	1.60
gamma-BHC (Lindane)					
$\bar{x}$	0.35	0.09	0.35	0.13	0.26
SD	0.51	0.29	0.48	0.53	0.49
min.	0.00	0.00	0.00	0.00	0.00
max.	1.60	0.92	1.60	2.30	2.30
gamma-Chlordane					
$\bar{x}$	0.55	0.35	0.42	0.66	0.51
SD	0.36	0.25	0.23	0.54	0.38
min.	0.00	0.00	0.00	0.00	0.00
max.	1.20	0.69	0.73	2.10	2.10
Heptachlor					
$\bar{x}$	0.16	0.16	0.10	0.53	0.24
SD	0.25	0.20	0.25	0.38	0.33
min.	0.00	0.00	0.00	0.00	0.00
max.	0.75	0.61	1.10	1.10	1.10
Heptachlor epoxide					
$\bar{x}$	0.21	0.25	0.32	0.31	0.28
SD	0.16	0.21	0.22	0.24	0.21
min.	0.00	0.00	0.00	0.00	0.00
max.	0.57	0.60	0.83	0.71	0.83
Methoxychlor					
$\bar{x}$	0.16	0.15	0.10	0.10	0.12
SD	0.21	0.38	0.11	0.15	0.20
min.	0.00	0.00	0.00	0.00	0.00
max.	0.84	1.20	0.34	0.54	1.20
Oxychlordane					
$\bar{x}$	0.43	1.02	0.66	0.65	0.63
SD	0.30	0.80	0.40	0.38	0.47
min.	0.07	0.14	0.13	0.07	0.07
max.	1.20	2.30	1.70	1.50	2.30
trans-Nonachlor					
$\bar{x}$	0.68	0.97	0.83	1.32	0.93
SD	0.51	0.51	0.41	0.77	0.61
min.	0.10	0.21	0.16	0.05	0.05
max.	2.10	1.60	2.10	2.80	2.80

Table 5.4. Lipid and organochlorine pesticide blood concentrations (ng/gng/g) in the subset of juvenile alligators tracked via radio telemetry during 2008 and 2009 in Lake Apopka and the NSRA. Different letters indicate differences between areas ($P < 0.05$). Total chlordane (sum of cis-nonachlor, trans-nonachlor, oxychlordane, heptachlor epoxide, alpha-chlordane, gamma-chlordane and heptachlor).

Constituent	Lake	Duda	Phase 1	West Marsh	Overall
Lipid					
n	8	7	12	13	40
$\bar{x}$	0.13	0.09	0.11	0.12	0.11
SD	0.04	0.04	0.04	0.03	0.04
min.	0.06	0.06	0.06	0.07	0.06
max.	0.17	0.19	0.17	0.17	0.19
4,4'-DDE					
$\bar{x}$	20.87 A	18.60 A	16.60 A	61.93 B	32.48
SD	20.99	23.09	7.93	27.72	29.12
min.	6.20	4.10	8.20	25.70	4.10
max.	67.00	74.10	29.70	116.00	116.00
Dieldrin					
$\bar{x}$	0.86 A	1.09 AB	2.01 B	1.56 AB	1.48
SD	0.81	1.64	1.32	1.19	1.30
min.	0.07	0.14	0.72	0.34	0.07
max.	2.60	5.00	4.70	4.40	5.00
Total Chlordane					
$\bar{x}$	0.23	0.34	0.30	0.35	0.31
SD	0.18	0.16	0.12	0.27	0.19
min.	0.00	0.00	0.10	0.00	0.00
max.	0.56	0.53	0.46	0.92	0.92
Toxaphene					
$\bar{x}$	32.14 AB	48.70 AB	26.86 A	67.89 B	45.49
SD	14.04	21.45	13.62	29.13	27.10
min.	12.50	19.30	13.00	17.10	12.50
max.	47.70	90.40	52.80	116.00	116.00

Table 5.5. Lipid and OCP concentrations (ng/gng/g) in blood of male and female alligators from Lake Apopka and the NSRA that were captured and tracked via radio telemetry during 2008 and 2009. Total chlordane (sum of cis-nonachlor, trans-nonachlor, oxychlordane, heptachlor epoxide, alpha-chlordane, gamma-chlordane and heptachlor).

	Lake		Duda		Phase 1		West Marsh	
Constituent	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**
Lipid								
N	4	4	2	5	5	7	7	6
$\bar{x}$	0.11	0.07	0.082*	0.15	0.14*	0.10	0.13	0.11
SD	0.05	0.01	0.03	0.02	0.01	0.04	0.04	0.02
min.	0.07	0.06	0.06	0.12	0.13	0.06	0.07	0.07
max.	0.19	0.09	0.10	0.17	0.15	0.17	0.17	0.14
4,4'-DDE								
$\bar{x}$	12.50	24.70	10.00	25.22	14.28*	18.26	62.49	61.28
SD	5.36	33.40	3.39	23.99	4.46	9.72	32.88	23.35
min.	8.80	4.10	7.60	6.20	8.20	8.50	25.70	35.90
max.	20.40	74.10	12.40	67.00	19.70	29.70	116.00	97.90
Dieldrin								
$\bar{x}$	0.67	1.51	0.50	1.01	2.26	1.84	1.61	1.50
SD	0.59	2.34	0.02	0.94	1.75	1.03	1.49	0.84
min.	0.14	0.17	0.48	0.07	0.72	0.87	0.34	0.50
max.	1.50	5.00	0.51	2.60	4.70	3.80	4.40	2.40
Total Chlordane								
$\bar{x}$	0.35	0.34	0.08	0.29	0.30	0.29	0.40	0.28
SD	0.24	0.07	0.11	0.17	0.17	0.08	0.31	0.22
min.	0.00	0.27	0.00	0.15	0.10	0.18	0.00	0.00
max.	0.53	0.43	0.16	0.56	0.46	0.43	0.92	0.64
Toxaphene								
$\bar{x}$	54.53	42.88	43.30	27.68	19.48	32.13	69.61	65.88
SD	25.70	17.95	2.69	14.38	3.43	15.95	36.61	20.45
min.	32.60	19.30	41.40	12.50	16.10	13.00	17.10	38.20
max.	90.40	57.40	45.20	47.70	23.40	52.80	116.00	96.90

Table 5.6. Comparison of lipid and OCP concentrations (ng/gng/g) in blood of male and female alligators from Lake Apopka and the NSRA that moved out of areas where initial capture occurred (Yes) during 2008 and 2009 with those that did not move (No). Total chlordane (sum of cis-nonachlor, trans-nonachlor, oxychlordane, heptachlor epoxide, alpha-chlordane, gamma-chlordane and heptachlor).

	Lake		**Duda**		**West Marsh**		**Phase 1**
Constituent	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**
Lipid							
n	1	7	5	2	11	2	12
$\bar{x}$	0.19*	0.08	0.13	0.15	0.12	0.11	0.11
SD		0.02	0.04	0.04	0.03	0.05	0.04
min.	0.19	0.06	0.06	0.12	0.07	0.07	0.06
max.	0.19	0.11	0.17	0.17	0.17	0.14	0.17
4,4'-DDE							
$\bar{x}$	20.40	18.34	23.70	13.80	63.32	54.30	16.60
SD		24.92	24.43	10.75	29.05	25.31	7.93
min.	20.40	4.10	7.60	6.20	25.70	36.40	8.20
max.	20.40	74.10	67.00	21.40	116.00	72.20	29.70
Dieldrin							
$\bar{x}$	0.60	1.15	1.05	0.39	1.59	1.40	2.01
SD		1.76	0.88	0.46	1.23	1.27	1.32
min.	0.60	0.14	0.48	0.07	0.34	0.50	0.72
max.	0.60	5.00	2.60	0.72	4.40	2.30	4.70
Total Chlordane							
$\bar{x}$	0.53	0.32	0.24	0.19	0.36	0.25	0.30
SD		0.16	0.22	0.01	0.29	0.06	0.12
min.	0.53	0.00	0.00	0.18	0.00	0.21	0.10
max.	0.53	0.47	0.56	0.20	0.92	0.29	0.46
Toxaphene							
$\bar{x}$	55.20	47.77	35.80	23.00	67.96	67.50	26.86
SD		22.99	14.29	11.46	31.81	7.64	13.62
min.	55.20	19.30	12.50	14.90	17.10	62.10	13.00
max.	55.20	90.40	47.70	31.10	116.00	72.90	52.80

Table 5.7. Lipid and OCP concentrations in blood of alligators from Lake Apopka and the NSRA and number of core areas used during 2008 and 2009. No significant differences (P > 0.05) were found. Total chlordane (sum of cis-nonachlor, trans-nonachlor, oxychlordane, heptachlor epoxide, alpha-chlordane, gamma-chlordane and heptachlor).

	Lake		**Duda**			**Phase 1**		**West Marsh**		
	1	**2**	**1**	**2**	**3**	**1**	**2**	**1**	**2**	**3**
Lipid										
n	2	6	4	2	1	10	2	9	3	1
$\bar{x}$	0.13	0.08	0.13	0.12	0.17	0.11	0.14	0.13	0.10	0.10
SD	0.08	0.02	0.02	0.07		0.03	0.04	0.03	0.04	
min.	0.07	0.06	0.10	0.06	0.17	0.06	0.11	0.07	0.07	0.10
max.	0.19	0.11	0.15	0.17	0.17	0.15	0.17	0.17	0.14	0.10
4,4'-DDE										
$\bar{x}$	14.60	19.93	25.30	11.75	21.40	15.62	21.50	67.08	46.23	62.70
SD	8.20	26.91	28.07	5.87		7.46	11.60	30.02	22.71	
min.	8.80	4.10	6.20	7.60	21.40	8.20	13.30	25.70	30.10	62.70
max.	20.40	74.10	67.00	15.90	21.40	28.50	29.70	116.00	72.20	62.70
Dieldrin										
$\bar{x}$	0.37	1.32	1.00	0.67	0.72	2.11	1.54	1.75	1.16	1.10
SD	0.33	1.87	1.11	0.26		1.40	0.94	1.32	0.99	
min.	0.14	0.17	0.07	0.48	0.72	0.72	0.87	0.34	0.50	1.10
max.	0.60	5.00	2.60	0.85	0.72	4.70	2.20	4.40	2.30	1.10
Total Chlordane										
$\bar{x}$	0.46	0.31	0.23	0.26	0.18	0.31	0.24	0.38	0.38	0.00
SD	0.10	0.17	0.24	0.13		0.12	0.08	0.28	0.22	
min.	0.39	0.00	0.00	0.16	0.18	0.10	0.18	0.00	0.21	0.00
max.	0.53	0.47	0.56	0.35	0.18	0.46	0.30	0.92	0.63	0.00
Toxaphene										
$\bar{x}$	47.55	49.08	39.05	26.95	14.90	29.38	14.25	63.22	72.23	96.90
SD	10.82	24.90	8.62	20.44		13.57	1.77	33.34	9.82	
min.	39.90	19.30	31.10	12.50	14.90	16.10	13.00	17.10	62.10	96.90
max.	55.20	90.40	47.70	41.40	14.90	52.80	15.50	116.00	81.70	96.90

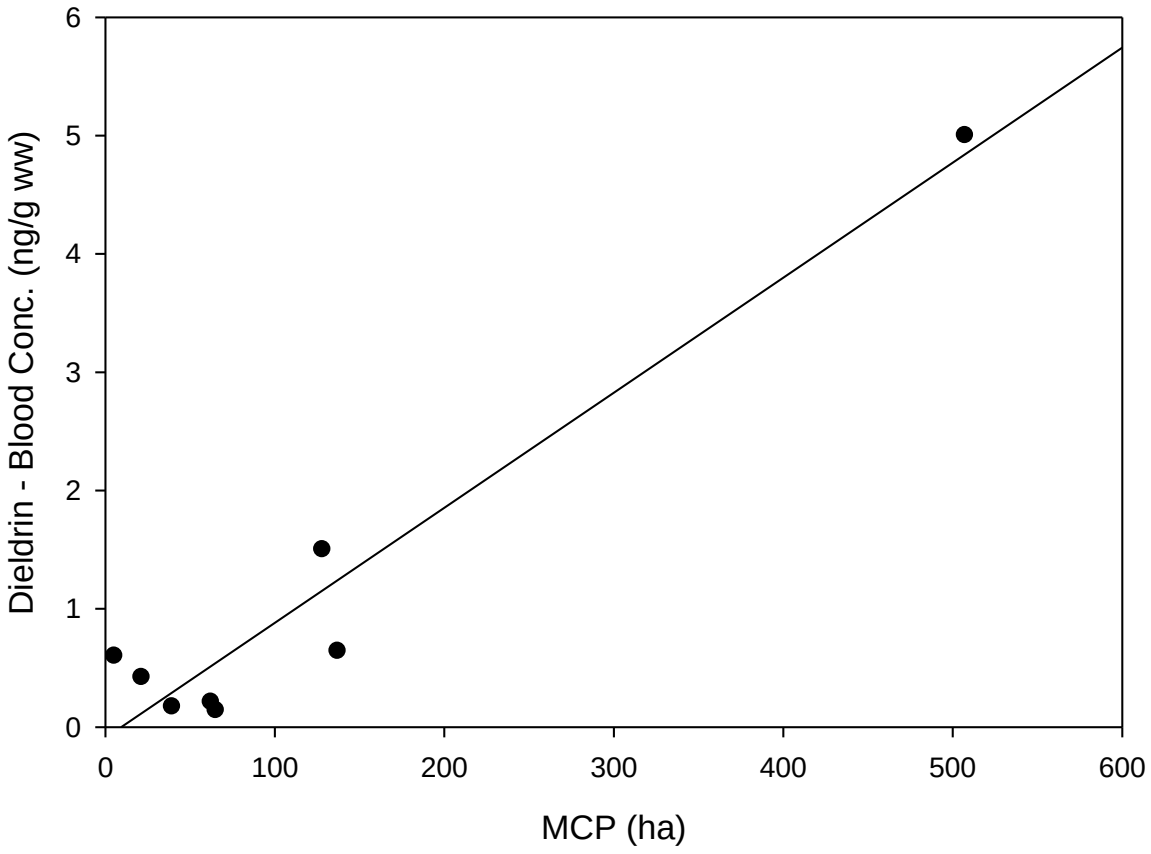

Figure 5.1. Linear regression of Minimum Convex Polygon against concentrations of dieldrin in blood of juvenile alligators from Lake Apopka ($r^2 = 0.92$, $P < 0.001$).

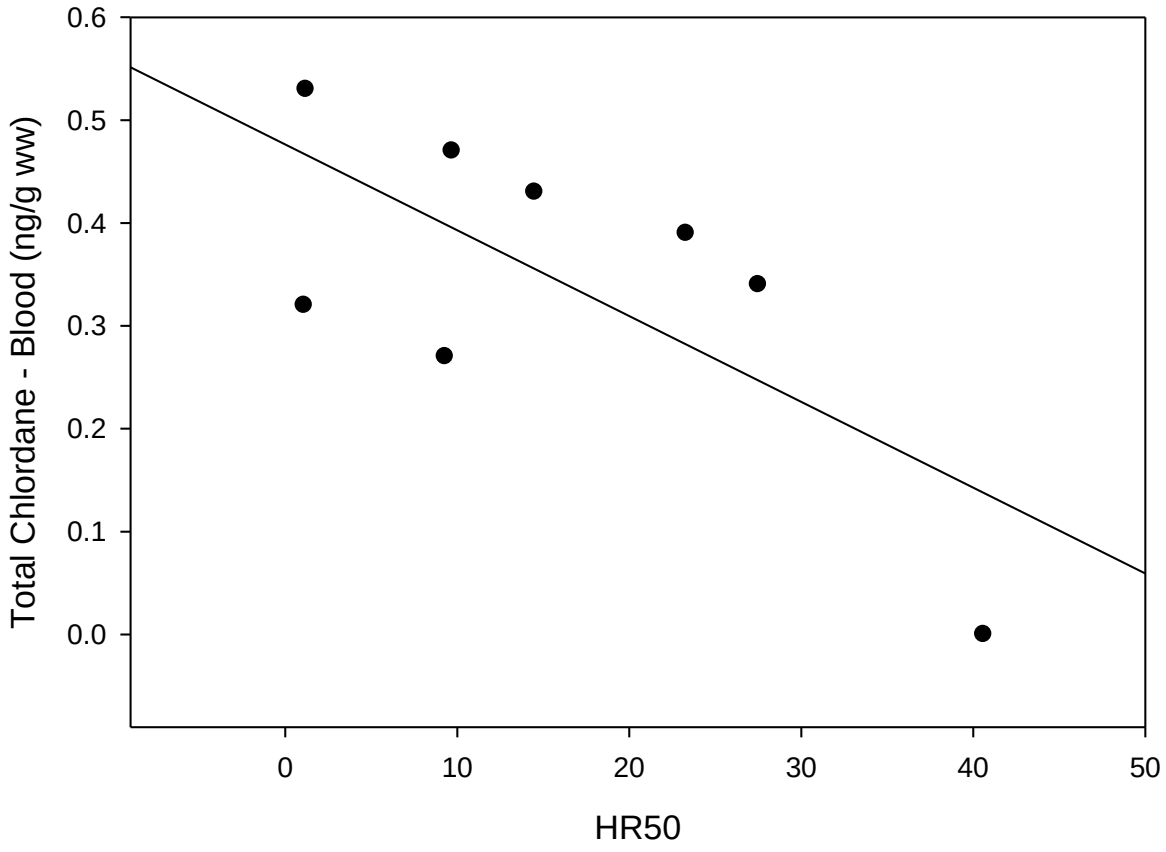

Figure 5.2. Concentrations of total chlordane in blood of juvenile alligators that were initially captured in Lake Apopka regressed against core home range estimates (r2 = 0.41, P = 0.05). Total chlordane (sum of cis-nonachlor, trans-nonachlor, oxychlordane, heptachlor epoxide, alpha-chlordane, gamma-chlordane and heptachlor).

CHAPTER 6
CONCLUSIONS

Radio telemetry and night-light surveys documented a mixed amount of movements of juvenile alligators among units within the NSRA and Lake Apopka. We saw a significant decline in the Lake Apopka alligator population adjacent to the NSRA between 2007 and 2009, with most movement of alligators from Lake Apopka to the recently flooded Phase 1 and Phase 2 units, and a lesser amount of movement from Lake Apopka to the Duda and West Marsh units. Alligators in the West Marsh had strong site fidelity and rarely moved out. Alligators in Duda exhibited moderate site fidelity, and most of those that ventured out, possibly due to drying conditions in the marsh and ponds, eventually moved back. Conversely, all alligators that moved into Phase 1 remained there. Phase 2 was being flooded as this study was nearing completion, but alligator movements into it were showing the same pattern as Phase 1. Home range size estimates indicated that juvenile alligator home ranges where considerably smaller than the study units, and alligators rarely migrated between units on a routine basis. We also found a size distribution more heavily weighted toward juvenile alligators in recently flooded areas, whereas adult alligators were more prevalent in areas with a longer period of water availability, such as Lake Apopka and the West Marsh.

Body condition analysis indicated that alligators in the NSRA were more robust than alligators in Lake Apopka. This might indicate juvenile alligators have increased foraging effectiveness, perhaps due to higher prey density or better nutritional quality of prey, or because of lower stress due to lower predation pressure from adult alligators.

Data from both the 2007 study (Appendix A) and 2008 study of pig frogs in the NSRA indicated that all OCPs of concern were well below toxicity reference values (TRV) for fish-eating birds (Table 4.1). Therefore, we conclude that fish-eating birds may safely consume amphibians that move into newly reflooded restoration areas if OCP soil concentrations and habitat management are similar to the areas where frogs were collected in 2007 and 2008.

West Marsh alligator hatchlings had consistently higher OCP concentrations than other areas but their body burdens posed a negligible risk to predatory birds as long as the birds' diet consisted of more than just West Marsh hatchlings.

Fasting alligators for seven days or more improved the correlation between total OCP concentrations in fat and liver and blood. This finding indicates that blood from fasting alligators may be a reliable index of total OCP concentrations in alligator liver and fat tissues.

In evaluating the relation between OCP concentrations in blood and home range (core, primary, and total), it is important to remember that all samples were collected at the time tracking devices were placed on alligators. In order to draw any inferences about the relationship between OCP blood concentrations and home range, the assumption must be made that the movements and activity patterns of juvenile alligators that were sampled were similar to their patterns prior to being sampled.

Primary and total home range estimates were not significantly associated with blood concentrations of lipid and OCPs in individuals from any of the areas. For core home range estimates, OCP blood concentrations of Lake Apopka alligators were significantly and negatively associated with total chlordane levels. Because the home range area increased in size from core to total home range, the increased variation may explain why significant associations were found for core home range, but not other home range measure. Alligators with the larger

core home ranges from Lake Apopka may have previously spent considerable time foraging in areas with lower levels of total chlordane.

In summary, we conclude that juvenile alligators are likely to move from Lake Apopka into newly flooded restoration units. Furthermore, we conclude that once in a newly flooded area, there is a high probability that juvenile alligators will remain in the area for an extended time, and that post-fasting OCP concentrations in their blood can be reflective of OCP availability in their local environment.

Future work

We observed dramatic increases of alligator in newly flooded units through annual night-light surveys but we were unable to determine at what point populations stabilize following flooding. Continued monitoring could provide information on the rate of colonization, whether populations will stabilize in size structure, and it would allow more reliable trend analysis by enabling water level to be used as a covariate to adjust counts. This would provide improved information on whether populations are sufficiently stable to provide a fair representation of OCP bioaccumulation.

A major assumption of using juvenile alligators as surrogates for risk of OCP toxicity to wading birds is whether they forage on the same prey. Our small *ad hoc* study examined food habits within the West Marsh and Phase 1 of the NSRA but lacked adequate sample size to make any firm inferences (Appendix I). We recommend that food habits work should be conducted on juvenile alligators in all units to evaluate the use of alligators as surrogates for OCP-vulnerable birds. .

Improved information on alligator growth rates would allow a better estimate of the amount of time needed for an alligator to increase significantly in weight and, thereby, accumulate OCPs. Some information (body condition) is now available that indicates that alligators grow relatively fast in the NSRA. However, additional data are needed to enable a reliable estimate.

Management alternatives

Possible management alternatives for using juvenile alligators to monitor OCP concentration within the NSRA are:

1. Collect OCP samples from juvenile alligators at least two years after initial flooding of unit.
2. Conduct capture/recapture efforts immediately after initial flooding and at the end of one feeding season to examine the change in OCP accumulation over feeding season.
3. Confirm bioaccumulation and bioaccumulation rates of alligators by feeding prey items from NSRA with known amounts of OCPs to juvenile alligators over a 2-year period.

Alternative 1 is based on the movement probability models that indicated juvenile alligator are highly unlikely to move out of recently flooded areas. Although alligators are unlikely to move out of the areas, it is uncertain when movement into the areas decreases. Based on observations from our studies during 2007-2009, we speculate that colonization of newly flooded units stabilizes between two to three years after initial flooding. Alligators captured within a unit two years post-flooding have a higher probability of being representative of OCP levels within that unit as time progresses.

Alternative 2 is a low cost, low tech method to assess OCP concentrations within the NSRA. Once a unit is flooded, an initial capture of alligators would be conducted and blood

samples collected for OCP analysis. A subsequent recapture effort could be conducted after a feeding season to and resample alligators. OCP concentrations could be analyzed over the feeding season to show OCP accumulation within the unit. One assumption would be that alligators that were recaptured within a unit did not move out of the unit for feeding. The movement probability models indicated that alligators had a low probability of moving out of newly flooded units.

Alternative 3 is a high cost, high tech method to assess bioaccumulation rates within units of the NSRA. Alligators would be captured from low OCP lakes and housed in pens. Initial OCP concentrations would be obtained and alligators would be fed pellets of known concentrations or preys items captured within the unit of interest. Bioaccumulation rates could be obtained by taking periodic blood samples and by examining OCP concentration of prey items. Assumptions are that the pen alligators would be fed at the same rate as wild alligators and that OCP bioaccumulation from the sediment within units is negligible.

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APPENDIX A

STATUS OF ALLIGATORS AND AMPHIBIANS ON LAKE APOPKA AND ITS NORTH SHORE RESTORATION AREA

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A Report Submitted to St. Johns River Water Management District
January 31, 2008

Chapter 1

Alligator Nesting and Alligator Surveys

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CHAPTER 1
INTRODUCTION

The restoration of Lake Apopka greatly depends on the ability to restore the structure and function of approximately 20,000 acres (8,100 ha) of wetlands along its north shore. The north shore marsh was drained and farmed for several decades. The impoundment and succeeding nonpoint pollution caused eutrophication and contributed to the impairment of Lake Apopka. In the late 1990s, the St. Johns Water Management District (SJRWMD) and Natural Resources Conservation Service (NRCS) began efforts to restore the north shore marsh for the restoration of Lake Apopka. Restoration of the north shore has been hindered because levels of residual organochlorine pesticides (OCP) in soils from historic agricultural applications in certain flooding blocks may pose a threat to wildlife, including migratory birds and threatened and endangered species. Indeed, a significant avian mortality event occurred after initial flooding in the winter of 1998-99. Since then, the USFWS has worked closely with the SJRWMD and the NRCS in identifying and restoring areas with low OCP soil concentrations (i.e., low risk to wildlife).

An important part of restoration involves monitoring OCP levels in soils and fish to estimate potential risk to piscivorous birds. In addition, bird eggs have been monitored in nearby areas for OCP burdens, hatch rates, and eggshell thickness. The egg study and survival study provide a reasonable picture of the health of the rookery at NSRA, which helps assess potential risks to birds that may forage there. For example, if birds in the rookery are in poor health, then they may be at greater risk than healthy birds, with regard to anticipated OCP exposure related to future restoration activities.

Because piscivorous birds may feed over a considerable area and have been shown to be difficult to monitor for site specific activities, we propose several alternative monitoring strategies for OCP accumulation within specific flooding blocks. Alligators, top order predators, have smaller home ranges than most piscivorous birds, have been shown to accumulate OCPs, and considerable data exist for the species on Lake Apopka. Adult male alligators in the Everglades have suggested home ranges (mean ± SE) of 144 ± 22.3 ha (~ 350 acres), with adult females having smaller ranges of 36 ± 16.8 ha (86 acres) (Phillips et al., 2003). Because adult females have a limited home range, consume a variety of prey items, and have easily identifiable nests; monitoring their level of exposure, hatching success, and habitat use can provide some measure of ecosystem health and trends in specific areas within the NSRA ecosystem. Monitoring of OCP levels and hatch rates in alligators will aid in evaluating remediation efforts and document trends in OCP levels in a top level, oviparous predator. Nearly 70% of the studies covered in a recent review of crocodilian ecotoxicology involved Lake Apopka's alligators (Campbell 2003). Recent information collected as a result of alligator mortalities on Lake Griffin indicate that alligator populations may be responding more to water quality and shad populations (therefore thiaminase and resultant thiamine deficiency) than to OCP contamination (Rice, et al 2007, P. Ross, pers. comm., and D. Honeyfield, et al. i*n press*). It is reasonable to reestablish a monitoring effort using alligators to couple with restoration efforts.

OBJECTIVES

1. To conduct May 2007 surveys of alligators on Lake Apopka and within impoundments.

2. To determine alligator nesting by helicopter and boat searches on Lake Apopka proper and within the SJRWMD impoundments on the north shore.
3. To collect (ca. July 15, 2007) and incubate 30 clutches of alligator eggs (FWC Gainesville Laboratory) from each of Lake Apopka proper and impoundments.

METHODS

Alligator Night Light Surveys

Alligator night light surveys were conducted, with an airboat, on Lake Apopka and all locations accessible in the Lake Apopka North Shore Restoration Area (NSRA). For each survey the boat had an operator who counted alligators and estimated sizes, and a passenger who recorded data. The survey craft was operated at a speed of 20-25 km/hr, only slowing down to get a more accurate count in areas of densely grouped alligators, or in dense vegetation, where sizes are difficult to determine at a high rate of speed. A 200,000 candle-power spotlight was used, shining it in a 180º arc in front of the survey craft. Other aspects of the survey as described by Woodward and Marion (1978) were conducted and recorded. We estimated the size of alligators in one-foot (30-cm) total length (TL) increments using the snout length:TL index as described by Chabreck (1966). For alligators that could not be confidently assigned to one-foot size classes, we assigned them to general size class categories, including 0-60 cm, 61-121 cm, 122-182 cm, ≥122 cm, ≥183 cm, and ≥274 cm. We classified an alligator's size as unknown if no indication of size was apparent and it was located in areas typically inhabited by all sizes of alligators.

Alligator Nesting, Egg Collection and Incubation

Alligator nests were collected in Lake Apopka and the NSRA beginning in late June and continuing through late July. A complete survey of alligator nests on Lake Apopka and NSRA was conducted by a biologist in a helicopter. Coordinates for all nests observed were determined using GPS. Teams of two collected nests with the use of airboats in the lake and used airboats, ARGO, ATV, and truck in the NSRA. All nests were found using ground searches. Clutch size, nest height, longest and shortest nest base diameters, air temperature, clutch cavity temperature, clutch depth, approximate percentage of daily shade on the nest, nest status, and adjacent habitat were recorded at time of clutch collection. Nests were completely searched for double clutches and turtle eggs, then completely reformed and tagged with flagging tape as a collected nest. All eggs, including fragments as well as unshelled and rotten eggs, were collected from each nest. Eggs were placed in natural nesting material within plastic bus pans and transported to the Florida Fish and Wildlife Conservation Commission's (FWC) Gainesville Research Lab on the day of collection. Egg transport followed the mortality-avoidance protocols established by Woodward et al. (1989).

Each clutch initially was inspected by the day after the arrival at the incubator. Incubators (Masson 1995) were maintained at 32 ±0.5° C and relative humidity of 95%. All clutches were weighed as a single mass on a spring scale (accuracy approximately □100 g), and intact eggs were transilluminated as a preliminary check for viability (Woodward et al. 1989). Non-banded eggs were opened to inspect for presence of zygotes visible to the naked eye (Masson 1995). If an egg's band development appeared retarded relative to others in its clutch, or if vascular color differed from that of apparently healthy eggs, the eggs were opened and the

stage of embryonic death determined. One viable egg in each clutch was sacrificed to determine clutch age and expected hatch date; these eggs were eliminated from viability analyses. Embryo age was estimated by Masson's (1995) embryo-staging table and by opaque-band progression (Ferguson 1982). Ten grams of yolk from this viable egg were collected, placed in a plastic vial, labeled with clutch ID number, frozen (-20° C) and subsequently analyzed for contaminants at Pace Analytical Services, Inc., Green Bay, WI. Five eggs per clutch were weighed (gram) and measured (millimeters) and then all eggs were set in moist sphagnum moss in bus pans and placed in the incubator. Second and third inspections were conducted on all clutches. During these inspections all eggs were transillunimated. Banded dead eggs were opened to determine when death occurred and only live eggs were placed back in the clutch for incubations. Hatching was expected at 60-65 days of incubation, and all unhatched eggs from each clutch were opened and classified after 75 days of incubation.

Clutch size (CS) is the number of eggs in a clutch cavity. Egg viability (V), the probability of an egg hatching from a given clutch, is calculated by dividing number of live hatchlings surviving more than one day by [CS – (# OPENED)], where # OPENED is the number of viable eggs opened for embryo staging (usually 1). Because we were mainly interested in the inherent viability of eggs, clutches from flooded or disturbed nests were excluded.

We used the two-component analysis technique of Woodward et al. (1993) a non-parametric Kruskal-Wallis analysis-of-variance (ANOVA) for analyzing egg viability data. Power analysis revealed that sample sizes of $\geq$30 clutches enabled us to determine differences of 10 percent viability at 0.05% statistical significance and 80% power.

All hatchlings were maintained in FWC hatchling facilities. Hatchlings were placed in separate containers maintaining clutch integrity. FWC Monel tags were affixed in webbing of the right hind foot of each hatchling and weight, TL and SVL were recorded for each hatchling. Hatchlings were maintained in the hatchling facility at appropriate temperatures and were fed commercial alligator feed for at least one week to assure absorption of yolk sacks and individual health. All animals were returned to their original nest sites within 2 weeks of hatching after Yosapong et al. (2006).

RESULTS

Alligator Night Light Surveys

The initial Lake Apopka alligator night light survey was conducted on May 22, 2007 with a replicated survey on June 13 2007. Both surveys required approximately 5 hours to complete, covering all accessible areas of the lake. Water levels were very low resulting in high counts and relatively high juvenile alligator numbers (Figure 1). Total counts for the surveys were 1,913 for Replicate 1 and 1,836 for Replicate 2. The size class distribution showed that the majority of alligators observed were in the 0-4 foot size classes (Table 1).

The initial Apopka NSRA survey was conducted on May 29, 2007 with a replicated survey on June 13, 2007. Due to low water levels in the restoration areas it was not possible to survey all areas scheduled. Survey areas included Lake Level Canal, Apopka Beauclair (A-B) Canal, West Duda Pool, East Duda Pool, and the West Marsh (Cells H and G). Due to high vegetation, which would result in incomplete counts, the perimeter canals were not surveyed. The size class distributions for the restoration areas showed that the West Marsh (Figure 2) and

Lake Level Canal (Figure 3) had a majority of 4-foot plus alligators, while on the other hand the A-B Canal (Figure 4) and Duda (Figure 5) had a majority of alligators in the 0-4 foot size classes (Table 1).

For analysis of trends, densities and size distributions, we assumed that the distribution of unknown size alligators, and alligators counted in general size classes, was consistent with the size distribution of known-sized alligators in each of those general size classes (Woodward and Moore 1990) and allocated them accordingly, using the Turnbull (1976) algorithm for interval censored size distribution data.

Alligator Nest Surveys, Egg Collection and Incubation

Nest surveys were conducted on Lake Apopka (2.7 hours) and NSRA (3.9 hours) from a helicopter in July 2007 (Table 2). From the helicopter, 106 nests were counted including 45 good nests from Lake Apopka, and 59 good nests, 1 flooded nest, and 1 depredated nest from NSRA (Table 3). Sixty-one alligator nests (31 from Lake Apopka and 30 from NSRA) were collected between June 29, 2007 and July 26, 2007 (Table 2). Eight field days were required to collect the 61 clutches and three to eight people participated in each field day. All nests were located and collected by ground searching. Although a helicopter was scheduled to help locate and direct biologists to nests, due to weather events and fires in other parts of Florida helicopter service was not available at the time of collections. A total of 61 clutches (from Lake Apopka and from NSRA) were collected. Average clutch size was 42.2 $\pm$ 7.7 for Lake Apopka and 40.5 $\pm$ 8.1 for NSRA clutches; maximum clutch size was 54 for both Lake Apopka and NSRA; and minimum clutch size was 19 for Lake Apopka and 29 for NSRA (Table 4). Mean clutch weights were 3.6 $\pm$ 8.1 kg from Lake Apopka and 3.3 $\pm$ 9.5 kg from NSRA. Although there at first appears to be a big difference in the median weights of clutches between Lake Apopka and NSRA, a Kruskall-Wallis Test indicates no significant difference (P=0.18). Per egg weight does appear to be significantly higher on Lake Apopka than NSRA (median of 80.7 vs. 87.5 gm; P = 0.059) based on the Kruskall-Wallis Test. Mean embryonic age at collections was 14 $\pm$ 6.7 days on Lake Apopka and 17.8 $\pm$ 11.6 for NSRA. Mean deposition dates were June 12-13 on Lake Apopka and June 22-23 for NSRA. The NSRA clutches were deposited a bit later than those in Apopka (P = 0.086). The degree of confidence (90%) was not high, but possibly biologically significant. We are examining potentially a more appropriate parametric test which would employ mean deposition dates rather than the median dates. A single clutch from NSRA contained 20 non-banded and 5 crushed eggs. A mean of 37.7 $\pm$ 8.4 (n = 31) Lake Apopka and 35.8 $\pm$ 10.5 (n = 29) NSRA eggs per clutch were set in the incubator.

During each of the three eggs checks throughout incubation, dead eggs were removed. After three checks, five clutches from both Lake Apopka and NSRA had > 20% banded dead eggs; six Lake Apopka clutches and eight NSRA clutches had no banded dead eggs throughout incubation . Hatching began on August 13 and extended through September 14 for all clutches. Egg viability rates for Lake Apopka clutches (0.81 $\pm$ 0.16, n = 31) and NSRA (0.73 $\pm$ 0.25, n = 30) were not significantly different based on Kruskall-Wallis Test but we are examining more appropriate tests for these data.

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Table 1. Summary of alligator surveys conducted on Lake Apopka and the NSRA during 2007.

Area	Lake Apopka	Lake Apopka	Lake Level Canal	Lake Level Canal	West Marsh	West Marsh	A-B Canal	A-B Canal	Duda	Duda
Date	22-May-07	13-June-07	29-May-07	13-June-07	29-May-07	13-June-07	29-May-07	13-June-07	29-May-07	13-June-07
Hatchlings	261	0	4	0	0	11	4	0	16	15
1-2 ft	508	721	1	0	17	2	4	3	0	0
2-3 ft	471	447	5	7	11	22	11	8	3	13
3-4 ft	151	168	17	19	20	14	13	1	9	2
4-5 ft	79	94	16	14	10	9	6	1	2	0
5-6 ft	71	57	21	14	9	28	6	0	0	1
6-7 ft	65	61	19	10	33	12	3	1	0	1
7-8 ft	28	35	4	2	23	6	0	1	0	0
8-9 ft	11	9	3	0	8	6	1	0	0	0
9-10 ft	12	7	0	0	5	7	0	0	0	0
10-11 ft	10	8	0	0	4	3	0	1	0	0
11-12 ft	7	2	1	0	4	0	0	0	0	0
12-13 ft	5	0	0	0	0	0	0	0	0	0
13+ ft	0	0	0	0	0	0	0	0	0	0
Unknown	5	0	21	10	1	11	0	7	4	0
Unk 0-2 ft	15	0	0	0	0	0	0	0	0	0
Unk 2-4 ft	10	6	0	1	2	21	0	3	1	4
Unk 4-6 ft	0	0	0	0	0	11	0	0	0	1
Unk 4+ ft	46	17	0	10	4	25	1	5	1	1
Unk 6+ ft	147	200	27	6	57	10	11	1	9	3
Unk 9+ ft	11	4	2	0	7	1	0	0	0	0
Total	1913	1836	141	93	215	199	60	32	45	41
0-4 ft	1416	1342	27	27	50	70	32	15	29	34

4+ ft	492	494	93	56	164	118	28	10	12	7
Unknown	5	0	21	10	1	11	0	7	4	0
Total	1913	1836	141	93	215	199	60	32	45	41

Table 2. Collection dates for nest removal from Lake Apopka and NSRA during June and July 2007.

Collection Date	Lake Apopka	Restoration Area	Total Nests
6/29/2007	10	8	18
7/3/2007	15	0	15
7/5/2007	0	4	4
7/6/2007	5	2	7
7/10/2007	0	7	7
7/11/2007	1	3	4
7/20/2007	0	3	3
7/26/2007	0	3	3
Total nests	31	30	61

Table 3. Alligator nest survey conducted on Lake Apopka and NSRA from helicopter July 2007.

	Lake Apopka	Restoration Area	Total
High dry nests	45	59	104
Flooded nests	0	1	1
Depredated nests	0	1	1
Survey hours	2.7	3.9	6.6

Table 4. Alligator clutch information collected from Lake Apopka and NSRA. *BD = Banded dead eggs.

	Lake Apopka	Restoration Area	Total Nests
Nests	31	30	61
Total Non-Banded Clutch	0	1	1
Mean Eggs/Clutch	42.2 ± 7.7	40.5 ± 8.1	41
Median Eggs/ Clutch	44	42	
Mode Eggs/Clutch	45	32	
Max. Egg/Clutch	54	54	54
Min. Eggs/Clutch	19	29	19
Clutches w/no BD eggs*	6	8	14
Clutches w/> 20% BD*	5	5	10
Mean Eggs/Clutch Set	37.7 + 8.4	35.8 + 10.5	60
Median Eggs/Clutch Set	39		60
Mode Eggs/Clutch Set	40		60
Max. Egg/Clutch Set	52	53	60
Min. Eggs/Clutch Set	14	0	61

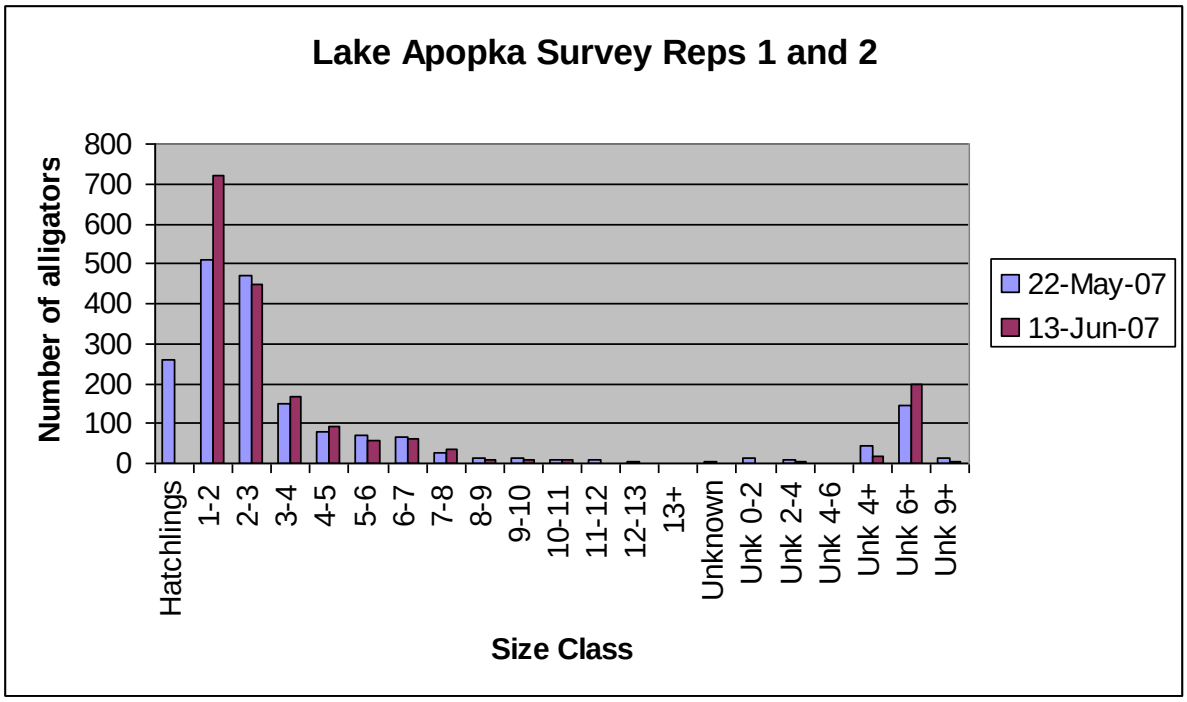

Figure 1. Summary of alligator surveys, in one-ft size classes, conducted on Lake Apopka during 2007.

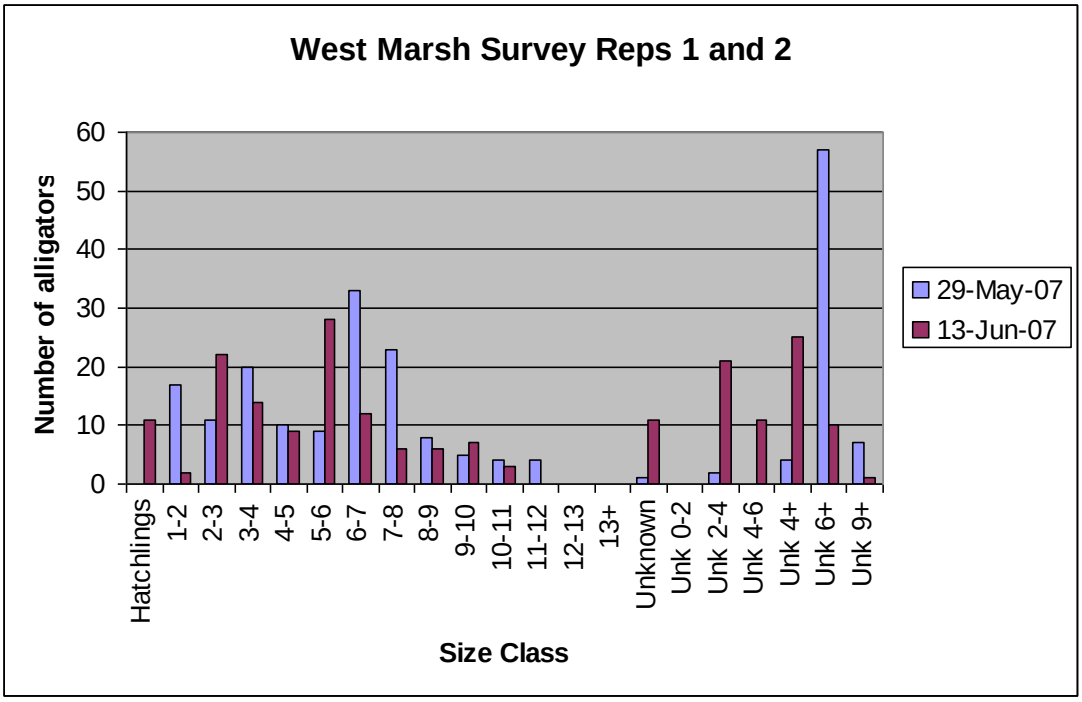

Figure 2. Summary of alligator surveys, in one-ft size classes, conducted on the West Marsh during 2007.

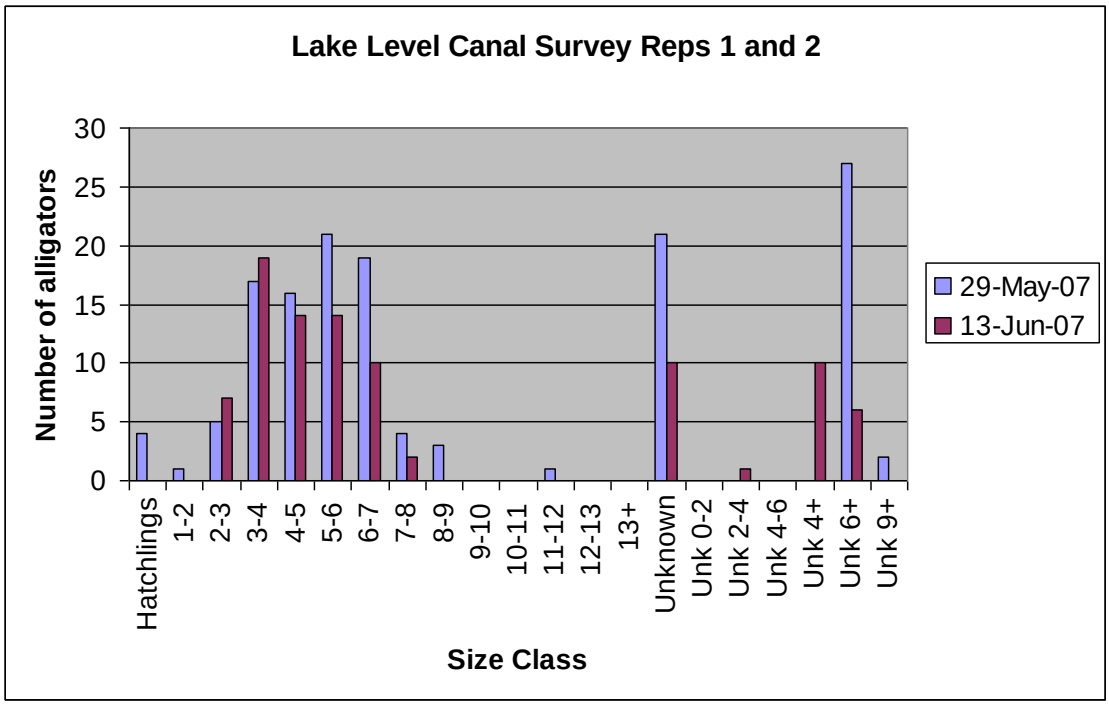

Figure 3. Summary of alligator surveys, in one-ft size classes, conducted along Lake Level Canal during 2007.

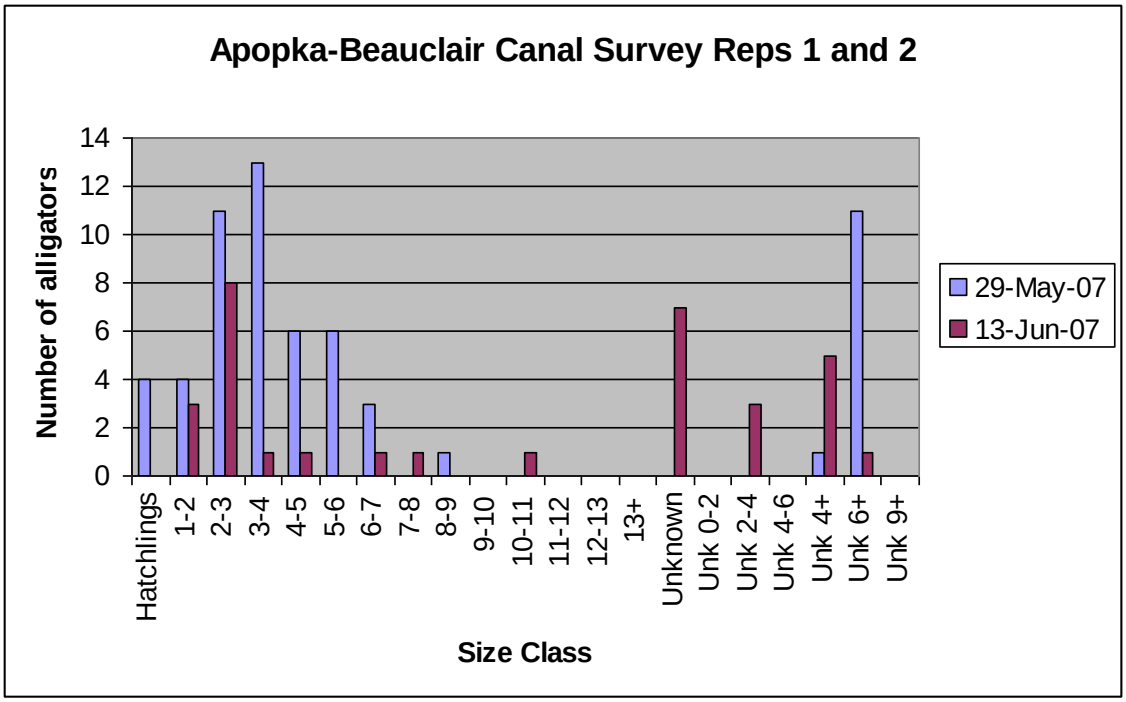

Figure 4. Summary of alligator surveys, in one-ft size classes, conducted along the Apopka-Beauclair Canal during 2007.

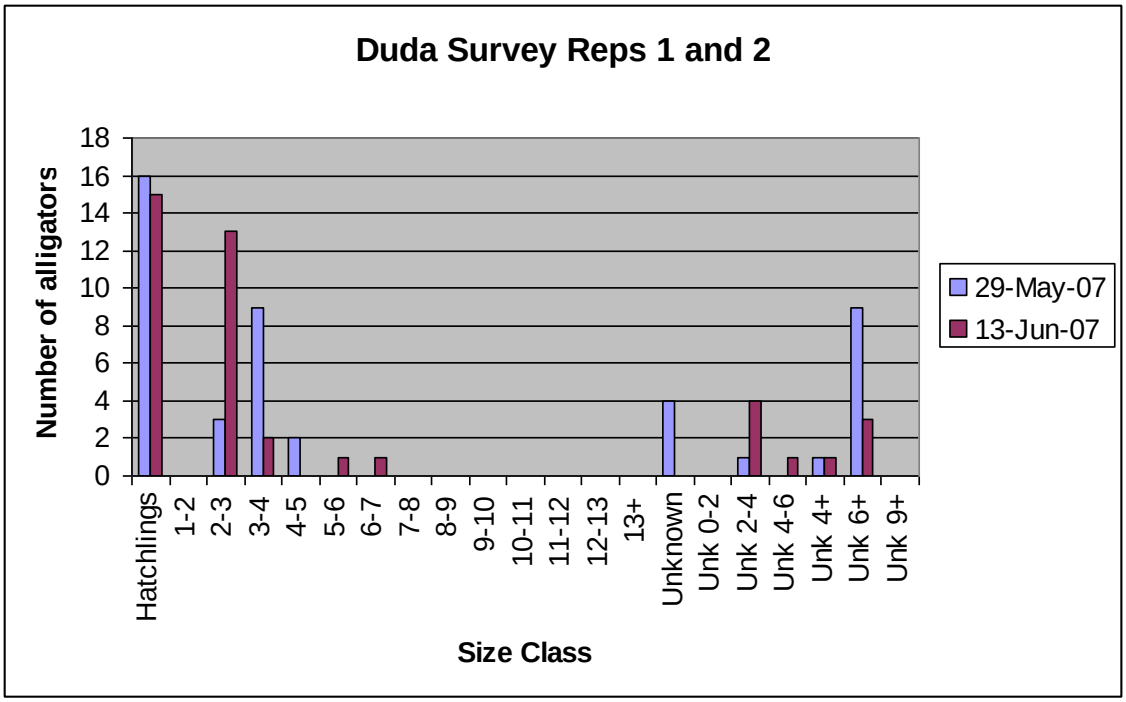

Figure 5.Summary of alligator surveys, in one-ft size classes, conducted on the Duda property during 2007.

CHAPTER 2
AMPHIBIAN SURVEYS

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INTRODUCTION

Amphibian populations, especially anurans (frogs and toads), may be good indicators of overall ecosystem health (Dale and Beyeler 2001) in the Lake Apopka marsh. Amphibians can readily absorb environmental contaminants through their integument, as well as through their gastrointestinal tract, with contaminants being one of many hypothesized causes for global amphibian declines (Collins and Storfer 2003). Recent research has demonstrated that amphibians can transmit contaminants to their offspring through eggs (Hopkins et al. 2006) and that endocrine disruption and other sub-lethal effects of pesticides have the potential to reduce survival and reproduction of amphibian populations (Hayes et al. 2006).

Although it is generally recognized that potential effects of contaminants on amphibian populations are great, no study has examined this at the population level. Recent advances in site occupancy estimation (MacKenzie et al. 2002, MacKenzie et al. 2006) provide a potential new method for modeling population level responses to environmental covariates, such as contaminants. Combining population level data with existing data on the spatial distribution of OCP contaminants would allow examination of the relationships between contamination and the distribution of anuran species. This would allow testing of the hypothesis that higher levels of contaminants result in lower occupancy (or probability of occurrence) of anurans on a species-by-species basis. This type of sampling and analysis would address an important ecological question, and provide the framework for a monitoring program that would be well suited to an adaptive management program for the restoration and management of the NSRA. For example, the management program currently reduces risk to birds by minimizing fish availability, but little can be done to prevent establishment of anuran populations. Examination of the OCP concentrations in anurans across the NSRA would provide critical information in assessing the potential risk to birds that may forage on anurans within these sites. These data may also be suitable for models that are being developed to evaluate restoration success in the Everglades of southern Florida by looking at the amphibian community as a whole.

METHODS

Anuran population sampling was conducted using a standardized visual encounter survey (VES) approach (Crump and Scott 1994). Sites were chosen randomly within each study stratum (management unit) in a manner such that any point had an equal likelihood of being chosen. The three main study units were: West Marsh, Duda, and Unit 2 West (Figure 1). A team of two or more observers visited chosen points no earlier than 30 min after sunset. The observers searched within a 20-m radius circle around the point for 1 person-hr using 6-volt halogen headlamps. All individual anurans observed were captured, identified to species, and measured snout-to-urostyle length (SUL). In addition, all species of anurans heard vocalizing within an estimated 100 m of the point were noted. The number of individuals of each anuran species calling was estimated in standardized classes for later analysis. Environmental data including air temperature, relative humidity, wind speed, water temperature, water depth, and time and date were collected at each sample.

Additional sampling was conducted by deploying sets of eight modified crawfish traps (Johnson and Barichivich 2004) at sites throughout the NSRA study area (Figure 2). These sites were chosen subjectively based on availability of standing water and access by vehicle. Trapping was done for 2-4 consecutive nights, and traps at each site were sampled at 2-3 times. At each sampling occasion, the species of each individual reptile and amphibian captured was recorded. Trapping was primarily used to supplement the VES and vocalization surveys which tend to fail to detect aquatic larvae and salamanders.

A total of 80 pig frogs (*Rana grylio*) were collected for OCP analysis. Twenty frogs were collected from each of the three major study areas and from Lake Apopka proper. The frogs were captured by hand or in traps, and then sacrificed using Benzocaine in dental anesthetic (Chen and Combs 1999). After death, the frogs were wrapped in aluminum foil, and then placed in individual, sealed plastic bags. The bags were labeled and stored frozen (-20° C) at the SJRWMD field office until they were sent under chain of custody to Pace Analytical Services, Inc., Green Bay, WI .

Occupancy analysis was conducted on each anuran species using a combination of the calling and VES data. For each sample, if a species was detected by either, or both, methods it was considered detected, otherwise it was treated as not detected. These detection and non-detection data, along with standardized covariables were analyzed using a Markov-Chain Monte Carlo (MCMC) Bayesian model in Program WinBUGS 1.4 (MacKenzie et al. 2006). Models were constructed both with, and without, a site effect on occupancy and with, and without, an environmental effect on detection. This resulted in four unique models (Table 1). Detection data for each of the 12 anuran species were analyzed with these four models. All models were sampled 20,000 times with the first 2,000 samples discarded as "burn-in" (Royle and Kery 2007). Model selection was performed by computing Akaike's Information Criterion (AIC) and using standard information theoretic methods for multi-model inference (Burnham 1998).

RESULTS

A total of 45 sites (15 sites per major study unit) were sampled three times using VES and vocalization techniques between 4 June 2007 and 14 August 2007 (Figure 2). During these

samples a total of eight amphibian species and five reptile species were observed (Table 2). Most species were observed during the night sampling fewer than 10 times, but the green treefrog (*Hyla cinerea*) was observed 67 times. Eleven species of anurans were detected using vocalization surveys, including three species that were not detected visually at the same sampling locations (Table 3).

Trapping of aquatic fauna was conducted at 17 sites in the NSRA (Figure 2). Five amphibian and three reptile species were captured in traps (Table 4). Of the amphibian species caught in traps, three were aquatic salamanders not observed during the nighttime VES surveys. Greater sirens (*Siren lacertina*) were the most abundant salamander captured.

Model selection results suggest there is no support for the hypothesis that occupancy varies by habitat for seven of the anuran species (Table 5). Green treefrog occupancy varied by habitat, with the highest occupancy rate in the West Marsh unit (Table 6). Model selection for four other species, the bronze frog (*Rana clamitans*), pig frog, southern leopard frog (*Rana sphenocephala*) and eastern narrowmouth frog (*Gastrophryne carolinensis*), was split between two models. Estimates for occupancy rates for these species were model-averaged, and in all cases, the occupancy rates were highest in West Marsh, followed by Duda and Unit 2-West (Table 6).

DISCUSSION

The occupancy modeling results indicate little support for the hypothesis that anuran occupancy is related to degree of pesticide contamination at the three main study sites. The majority of species were not found to be distributed differently among the study units, and of those that were, all had highest occupancy rates in the West Marsh unit. This unit was intermediate in terms of contaminant exposure, but it was highest in water depth. The year 2007 was particularly dry for central Florida, and the lack of water at the Duda and Unit 2-West sites probably explain the pattern in occupancy more than any other factor, including contaminants.

Additionally, contaminant levels in the pig frogs collected at the various areas were low. This indicates that although OCPs may be persistent in the soil, they are not necessarily being sequestered by the amphibians. Therefore, with little evidence of an effect of OCP contaminants on occupancy of amphibian populations or on the body burdens of the individuals, we conclude that there is little current danger to amphibians in the NSRA units examined in this study.

Table 1: Name and description of each of the four models considered for each species. Unit refers to the three main study units: Duda, Unit 2-West, and West Marsh (shown in Figure 1).

Model	Description
Psi(.)p(.)	Occupancy constant across units; detection not a function of environmental factors
Psi(unit)p(.)	Occupancy varies by unit; detection not a function of environmental factors
Psi(.)p(env)	Occupancy constant across units; detection dependent on environmental factors
Psi(unit)p(env)	Occupancy varies by unit; detection dependent on environmental factors

Table 2: The count of the number of individuals of amphibian and reptile species observed during standard Visual Encounter Surveys at the Lake Apopka NSRA.

Common Name	Scientific Name	Count
Southern Toad	*Bufo terrestris*	1
Green Treefrog	*Hyla cinerea*	67
Squirrel Treefrog	*Hyla squirella*	2
Eastern Narrow-mouthed Toad	*Gastrophryne carolinensis*	8
Bullfrog	*Rana catesbeiana*	2
Green Frog	*Rana clamitans*	1
Pig Frog	*Rana grylio*	6
Southern Leopard Frog	*Rana sphenocephala*	3
American Alligator	*Alligator mississippiensis*	3
Green Anole	*Anolis carolinensis*	5
Florida Water Snake	*Nerodia fasciata*	3
Brown Water Snake	*Nerodia taxispilota*	1
North Florida Swamp Snake	*Seminatrix pygaea*	1

Table 3: The count of the number of vocalization surveys during which each individual anuran species was detected at the Lake Apopka NSRA.

Common Name	Scientific Name	Count
Southern Toad	*Bufo terrestris*	5
Greenhouse Frog	*Eleutherodactylus planirostris*	24
Green Treefrog	*Hyla cinerea*	85
Squirrel Treefrog	*Hyla squirella*	14
Southern Chorus Frog	*Pseudacris nigrita*	7
Little Grass Frog	*Pseudacris occularis*	3
Eastern Narrow-mouthed Toad	*Gastrophryne carolinensis*	35
Bullfrog	*Rana catesbeiana*	2
Green Frog	*Rana clamitans*	5
Pig Frog	*Rana grylio*	43
Southern Leopard Frog	*Rana sphenocephala*	5

Table 4: The count of the number of individuals captured in aquatic funnel traps by species in the Lake Apopka NSRA.

Common Name	Scientific Name	Count
Pig Frog	*Rana grylio*	33
Southern Leopard Frog	*Rana sphenocephala*	1
Eastern Newt	*Notophthalmus viridescens*	22
Dwarf Siren	*Pseudobranchus axanthus*	1
Greater Siren	*Siren lacertina*	43
Florida Water Snake	*Nerodia fasciata*	2
Florida Green Water Snake	*Nerodia floridana*	8
Common Musk Turtle	*Sternotherus odoratus*	53

Table 5: Model selection results for each of the 12 anuran species for the four occupancy models (see Table 1) with Akaike's Information Criterion (AICc), the difference between AICc for each model and the minimum AICc (□AICc), the number of parameters in the model (K) and the -2 log likelihood of the model. Model names in bold are those selected as the best fit for each species.

	Model	AICc	DAICc	K	-2 log-like
Cricket Frog *Acris gryllus*	**Psi(.)p(.)**	21.95	0	2	17.95
	Psi(unit)p(.)	23.95	2	4	15.95
	Psi(.)p(env)	28.55	6.6	5	18.55
	Psi(unit)p(env)	33.91	11.96	7	19.91
	Model	AICc	DAICc	K	-2 log-like
Southern Toad *Bufo terrestris*	**Psi(.)p(.)**	16.34	0	2	12.34
	Psi(unit)p(.)	22.72	6.38	4	14.72
	Psi(.)p(env)	36.06	19.72	5	26.06
	Psi(unit)p(env)	39.13	22.79	7	25.13
	Model	AICc	DAICc	K	-2 log-like
Greenhouse Frog *Eleutherodactylus planirostris*	**Psi(.)p(.)**	89.64	0	2	85.64
	Psi(unit)p(.)	92.64	3	4	84.64
	Psi(.)p(env)	121.3	31.66	5	111.3
	Psi(unit)p(env)	126.8	37.16	7	112.8
	Model	AICc	DAICc	K	-2 log-like
Eastern Narrowmouth Frog *Gastrophryne carolinensis*	**Psi(.)p(.)**	110.8	0	2	106.8
	Psi(unit)p(.)	112.4	1.6	4	104.4
	Psi(.)p(env)	135.4	24.6	5	125.4
	Psi(unit)p(env)	135.9	25.1	7	121.9
	Model	AICc	DAICc	K	-2 log-like
Green Treefrog *Hyla cinerea*	**Psi(unit)p(.)**	120.8	0	4	112.8
	Psi(.)p(.)	123.9	3.1	2	119.9
	Psi(unit)p(env)	155	34.2	7	141
	Psi(.)p(env)	164	43.2	5	154

Table 5 (continued):

	Model	AICc	□AICc	K	-2 log-like
Squirrel Treefrog	**Psi(.)p(.)**	62.7	0	2	58.7
Hyla squirella	Psi(unit)p(.)	65.69	2.99	4	57.69
	Psi(.)p(env)	89.03	26.33	5	79.03
	Psi(unit)p(env)	91.39	28.69	7	77.39
	Model	AICc	□AICc	K	-2 log-like
Southern Chorus Frog	**Psi(.)p(.)**	46.88	0	2	42.88
Pseudacris nigrita	Psi(unit)p(.)	49.02	2.14	4	41.02
	Psi(.)p(env)	61.63	14.75	5	51.63
	Psi(unit)p(env)	63.31	16.43	7	49.31
	Model	AICc	□AICc	K	-2 log-like
Little Grass Frog	**Psi(.)p(.)**	27.78	0	2	23.78
Pseudacris occularis	Psi(unit)p(.)	30.67	2.89	4	22.67
	Psi(.)p(env)	40.5	12.72	5	30.5
	Psi(unit)p(env)	42.47	14.69	7	28.47
	Model	AICc	□AICc	K	-2 log-like
Bullfrog	**Psi(.)p(.)**	22	0	2	18
Rana catesbiana	Psi(unit)p(.)	24.02	2.02	4	16.02
	Psi(.)p(env)	34.4	12.4	5	24.4
	Psi(unit)p(env)	41.47	19.47	7	27.47
	Model	AICc	□AICc	K	-2 log-like
Bronze Frog	**Psi(unit)p(.)**	39.97	0	4	31.97
Rana clamitans	**Psi(.)p(.)**	41.52	1.55	2	37.52
	Psi(unit)p(env)	47.6	7.63	7	33.6
	Psi(.)p(env)	51.06	11.09	5	41.06
	Model	AICc	□AICc	K	-2 log-like
Pig Frog	**Psi(unit)p(.)**	94.73	0	4	86.73
Rana grylio	**Psi(unit)p(env)**	96.48	1.75	7	82.48
	Psi(.)p(.)	107.9	13.17	2	103.9
	Psi(.)p(env)	135.6	40.87	5	125.6
	Model	AICc	□AICc	K	-2 log-like
Southern Leopard Frog	**Psi(.)p(.)**	50.24	0	2	46.24
Rana sphenocephala	**Psi(unit)p(.)**	51.04	0.8	4	43.04
	Psi(.)p(env)	72.42	22.18	5	62.42
	Psi(unit)p(env)	72.29	22.05	7	58.29

Table 6: Parameter estimates for detection probability (p) and occupancy rate (psi) and standard **errors (S.E.) and lower and upper 95% credibility estimates. Species for which the best model** included study unit in occupancy have estimates of psi for West Marsh (WM), Duda, and Unit 2-West (U-2W) reported separately. Estimates with a * are model averaged from all four models in the model set.

	Parameter	Estimate	S.E.	Lower 95% C.I.	Upper 95% C.I.
Cricket Frog	p	0.1271	0.1314	0.0104	0.5034
Acris gryllus	psi	0.3341	0.2599	0.0339	0.9344
Southern Toad	p	0.7787	0.1862	0.3163	0.9935
Bufo terrestris	psi	0.0448	0.0315	0.0056	0.1242
Greenhouse Frog	p	0.3119	0.0897	0.1563	0.4994
Eleutherodactylus planirostris	psi	0.5367	0.1524	0.2961	0.9009
Eastern Narrowmouth Frog	p *	0.3889			
Gastrophryne carolinensis	psi[WM] *	0.5501			
	psi[Duda] *	0.3506			
	psi[U-2W] *	0.2288			
Green Treefrog	p	0.7629	0.0414	0.6770	0.8375
Hyla cinerea	psi[WM]	0.9414	0.0548	0.7975	0.9984
	psi[Duda]	0.5976	0.1177	0.3633	0.8165
	psi[U-2W]	0.8346	0.0907	0.6264	0.9738
Squirrel Treefrog	p	0.2087	0.0972	0.0718	0.4369
Hyla squirella	psi	0.4821	0.2010	0.1885	0.9409
Southern Chorus Frog	p	0.2961	0.1456	0.0702	0.6052
Pseudacris nigrita	psi	0.2458	0.1547	0.0704	0.6811
Little Grass Frog	p	0.1123	0.1039	0.0149	0.4056
Pseudacris occularis	psi	0.416	0.2643	0.0624	0.9522
Bullfrog	p	0.1309	0.1362	0.0101	0.5154
Rana catesbiana	psi	0.3344	0.2604	0.0325	0.9376
Bronze Frog	p *	0.2832			
Rana clamitans	psi[WM] *	0.4336			
	psi[Duda] *	0.0621			
	psi[U-2W] *	0.0088			
Pig Frog	p *	0.7536			

Rana grylio	psi[WM] * psi[Duda]	0.8181
	* psi[U-2W]	0.1139
	*	0.0455
Southern Leopard Frog *Rana sphenocephala*	p *	0.1671
	psi[WM] * psi[Duda]	0.5665
	* psi[U-2W]	0.4110
	*	0.2204

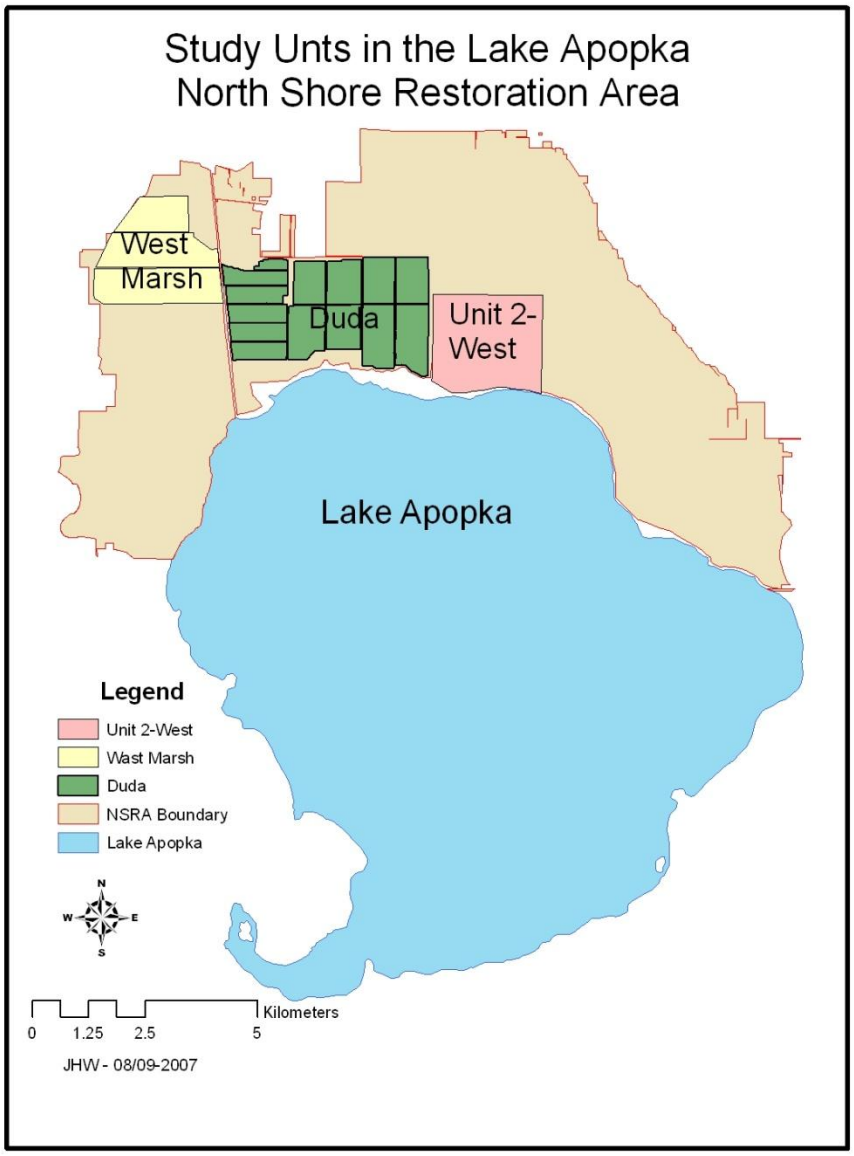

Figure 1: The NSRA showing the 3 main study units (West Marsh, Duda, and Unit 2 West) and Lake Apopka.

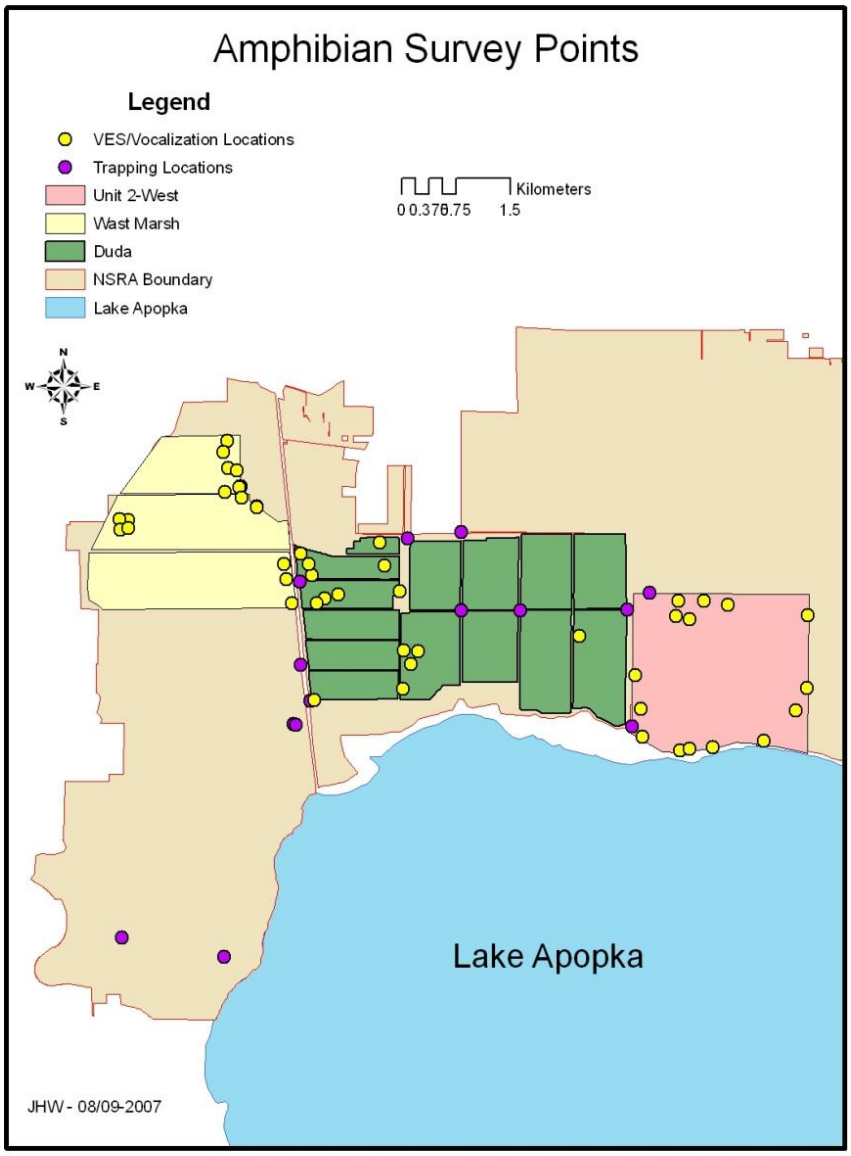

Figure 2: Map showing the locations of the 45 standard sampling locations (yellow) at which visual encounter and vocalization surveys were conducted and the 17 sites at which aquatic funnel trapping was conducted (purple).

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CHAPTER 3
ORGANOCHLORINE PESTICIDE CONCENTRATIONS IN JUVENILE ALLIGATORS, ALLIGATOR EGGS, AND PIG FROGS

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INTRODUCTION

An important part of the restoration of the North Shore Restoration Area (NSRA) has been to estimate and reduce potential risk to piscivorous birds. To estimate risk, OCP levels in soils and fish are monitored before, during, and after an area has been re-flooded, and these levels are then compared to the lowest observed adverse effect levels (LOAEL) known for birds. In addition to soils and fish, monitoring efforts have also included examination of bird eggs for OCP burdens, hatch rates, and eggshell thickness. However, piscivorous birds may feed over a considerable area and have been shown to be difficult to monitor for site-specific activities.

Therefore, the present study investigated the potential for using juvenile alligators, alligator eggs, and pig frogs as indicators of OCP exposure and effects within specific flooding blocks. Our objectives were: 1) to determine if contaminant concentrations in juvenile alligators, alligator eggs, and pig frogs differed among NSRA flooding units and Lake Apopka; 2) to determine if juvenile size correlated with contaminant burdens; 3) to evaluate the potential for scutes to be used as a nonlethal indicator of body (fat) burdens; 4) to evaluate risk posed to wading birds that consume pig frogs by using established trigger values for fish; and 5) to evaluate the frogs' body burdens in terms of health risks to frogs and other amphibians.

METHODS

Study Areas

The NSRA lies along the northern shore of Lake Apopka (Lake and Orange Counties, FL, USA). It encompasses more than 8,000 ha of area, primarily abandoned agricultural fields. Comparisons will be made among four areas in the NSRA: the Duda impoundments, the West Marsh, Unit 2-West, and Lake Apopka proper (Figure 1). The selection of the four areas was based primarily on a gradient of pesticide levels detected in the soils by the SJRWMD (unpublished data). The Duda impoundment represents an area with low OCP contamination; the West Marsh represents an area with medium OCP contamination; and Unit 2 West represents an area with high OCP contamination. Although soils from Lake Apopka have not been tested,

this lake is the site of a known pesticide contamination event, and serves as a possible source or refuge for alligators found in the impoundments.

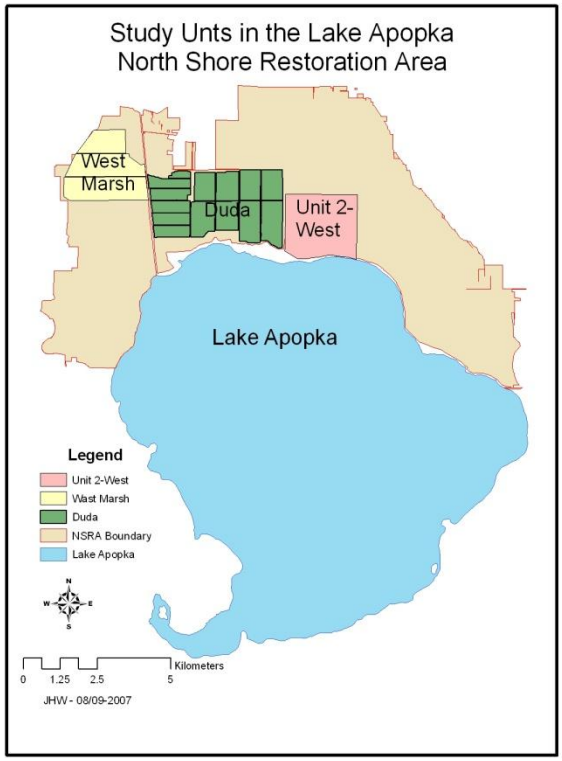

Figure 1: Map of Lake Apopka and NSRA (outlined in red) showing the major sampling units to be used in this study.

Alligator Captures

Alligators (n = 12) ranging from 0.76-1.29 m TL were captured from the study areas and sampled/examined for several endpoints, as detailed below. Areas include: West Marsh, Duda impoundment, Unit 2 West impoundment, and Lake Apopka proper. Alligators were captured for sampling during the month of June 2007. Captures were conducted from airboats at night by two-person crews. Alligators were hand-grabbed or snared. The alligators' mouths was secured with electrical or duct tape. A monel tag was attached to the middle webbing on each of the rear feet to provide unique identification for each animal. GPS coordinates were recorded from the capture site. Weight, length (both TL and SVL), tail circumference, sex, and time of capture were recorded.

Blood samples (≥ 10 ml), muscle biopsies (5 g), and liver were collected from six alligators. Scute and adipose tissue samples were collected from all 12 animals. Blood samples

were collected from the postcranial sinus of each alligator, placed in heparinized Vacutainer tubes, labeled, and stored on ice while in the field.

Alligators were euthanized via cervical dislocation with double pithing and tissue samples were collected using standardized methods (Rauschenberger et al 2004). The samples were placed in a labeled, pre-cleaned containers and temporarily stored on ice until transferred to a -20 °C freezer.

Alligator Nesting, Egg Collection and Incubation

We collected 30 alligator egg clutches from the margins of Lake Apopka proper and 30 from the three study units in NSRA. Attempts were made to evenly distribute numbers of clutches among the NSRA. Personnel approached nests from vehicles on dikes, airboats, and foot. At the time of collection, we recorded clutch size, nest height (from substrate base to highest point of nest), longest and shortest nest base diameters, air temperature (in shade), clutch cavity temperature, clutch depth (to the uppermost egg), approximate percentage of daily shade on the nest, nest status (dry or partially flooded with primary target of high dry nests), and adjacent habitat. Each nest was dismantled and searched completely because of the possibility of multiple clutches (two or more females ovipositing in a single nest). All eggs, including fragments as well as unshelled and rotten eggs, were collected from each nest. Egg transport followed the mortality-avoidance protocols established by Woodward et al. (1989). Eggs were placed in natural nesting material within plastic bus pans and transported to a central incubation facility on the day of collection.

One or two viable eggs in each clutch was sacrificed to determine clutch age and expected hatch date. The entire contents of the egg used in each clutch for staging were placed in pre-cleaned 20 ml scintillation vials, placed immediately on ice, and transferred to a -20 °C freezer. Samples were later placed on ice in plastic coolers and shipped overnight to Pace Analytical Laboratory for chemical analysis.

Pig Frog Sampling

A total of 80 pig frogs were collected from NSRA units and Lake Apopka's shoreline by field crews by hand, traps, or with a gig (see amphibian chapter for additional information).

Analysis of OCP in Animal Tissues and Alligator Egg Yolk

Homogenized whole pig frogs, alligator tissue and yolk samples were analyzed for OCP content using methods described in Appendix I.

Statistical Analysis of OCP Concentrations in Animal Tissues and Alligator Egg Yolk

Pace Laboratory transferred results directly to the SJRWMD, where a database was created containing all the data for juvenile alligators, alligator eggs, and pig frogs. Separate datasets were then created for juvenile alligators, alligator eggs, and pig frogs, respectively. Within each of the three datasets, variables were created to indicate whether an analyte was measured above or below the limit of detection (1 = above, 0 = below). Each analyte was evaluated to determine

whether it was measured above the limit of detection in at least 6% of the samples of each individual dataset. Analytes only present in ≤5% of the samples from each individual dataset were deleted from further statistical analyses. For example, if toxaphene was detected in 6% of the alligator egg samples, then it would stay in the alligator egg dataset. If toxaphene was only detected in 5% of the frog samples, it would be deleted from the frog dataset. For the juvenile alligator study, fat tissue contaminant concentrations of animal 37177 were deleted because the lipid content (0.7%) was inconsistent with the normal range for lipids in adipose tissue (40-90%), but consistent with lipid values found in muscle. Pace Laboratory was contacted and confirmed their results, so human error likely occurred during sample collection.

In cases where the analyte remained in the dataset, but was measured below the detection limit, half of the limit of detection was inserted to serve as the value. For values with "I" qualifier (above detection limit but below quantitation limit), the given result (detection limit value) was used.

The amount of contaminant in any given tissue is strongly associated with the amount of lipid in the tissue, and therefore contaminant data was lipid-normalized. In addition, contaminant data was log-transformed because prior studies involving contaminant concentrations in alligator tissues showed log transformation improves regression models by mitigating problems associated with heterogeneity of variance (Rauschenberger et al 2004).

Because half the limit of detection (LOD) was used as the value for analytes below the LOD, nonparametric analysis of variance (PROC NPAR1WAY, SAS 2006) was used to compare contaminant concentrations among the NSRA units and Lake Apopka. Significance was declared at $p < 0.05$ and Duncan's multiple comparison test (PROC GLM, SAS 2006) was conducted using the ranks as scores. Because nonparametric statistics were used for comparisons, reported descriptive statistics include median, quartile 1 (Q1), and quartile 2 (Q2).

The study area was divided into two main units (Lake Apopka and NSRA), and within each unit there were additional subunits. The number of subunits differed by dataset, as eggs, juveniles, and pig frogs were collected from different areas using different techniques. For each dataset, the two main units were compared. Subsequently, comparisons were made among the subunits to evaluate whether significant differences could be determined among units within the NSRA.

The next set of analyses examined the relationship between juvenile alligator size parameters and OCP fat burdens and whether scutes would be a good predictor of OCP concentrations in fat. These analyses were conducted (PROC REG, SAS 2006) using lipid-normalized, log-transformed contaminant concentrations.

To evaluate risk to wading birds that consume pig frogs, using a deterministic risk assessment, OCP concentrations in pig frogs were compared to trigger values for OCP concentrations previously established for fish (Duda sub-East biological opinion, USFWS 2002). The 95th percentile OCP concentrations in frogs were divided by the fish trigger values in order to calculate a hazard quotient for each respective analyte. These hazard quotients were then summed to calculate a hazard index. A hazard index ≥1 indicates effects are likely to occur, while a hazard index of <1 indicates effects are unlikely to occur.

To evaluate risk to amphibians that are exposed to OCPs, OCP concentrations in pig frogs were compared to the lowest known OCP body burdens that have been associated with adverse effects (LOAEL) in amphibians using a deterministic risk assessment. The 95th

percentile OCP concentrations in frogs were divided by the amphibian LOAEL values in order to calculate a hazard quotient for each respective analyte. These hazard quotients were then summed to calculate a hazard index. A hazard index ≥1 indicates effects may occur, while a hazard index of <1 indicates effects are unlikely to occur.

RESULTS

Alligator eggs and OCP concentrations

Comparisons of OCP concentrations in clutches from the NSRA and Lake Apopka proper showed that 12 OCP analytes were found at significantly higher levels in NSRA clutches (Table 1). Subsequent comparisons among units within the NSRA and Lake Apopka proper indicated significant differences among the units (Table 2). Except for endrin aldehyde and 4,4-DDT, clutches from the West Marsh had significantly higher OCP concentrations than those of Lake Apopka proper and the Duda flooding unit. OCP concentrations in Unit 2 West clutches were also significantly less than those from the West Marsh, with the exception of 4,4-DDE, dieldrin, and oxychlordane. These differences may be due to a number of reasons including differing levels of OCP contamination in the local home ranges of reproductive females, and the lifelong exposure of reproductive females to OCPs.

Juvenile alligators and OCP tissue concentrations

Juvenile alligators (n = 12) were collected from Lake Apopka proper and the NSRA. Scute and adipose tissue was collected from all 12 alligators, and blood, liver, and muscle was collected from 6 of the 12 alligators. The stomach contents of one animal was screened to determine OCP concentrations of diet. Adipose tissue had the highest lipid concentration of all tissues sampled and the highest OCP concentrations among all tissues. Comparisons of adipose tissue OCP concentrations showed no significant differences between NSRA and Lake Apopka alligators (Table 3), and the lack of differences is likely due to the variability in OCP concentrations and the limited sample size. Within the NSRA, juvenile alligators from the West Marsh had the highest median OCP concentrations of all the units sampled. Duda had the lowest (Table 4). Given the trends, juvenile alligators' OCP body burdens appear to differ among the NSRA units, suggesting that juvenile alligators may be a viable monitoring tool, if larger sample sizes and knowledge of their home ranges can be gained. Furthermore, juvenile alligators' total length (TTL) was regressed against OCP concentrations in adipose tissue to determine if TTL was predictive of adipose tissue burdens. Of all OCP analytes evaluated, only 4,4-DDT showed a significant association with TTL. Because OCPs are known to bioaccumulate in older animals, the limited TTL range of the sampled alligators (76-129 cm) may have precluded the ability to see differences as animals were most likely of similar age classes.

To evaluate the use of scutes as a nonlethal method for monitoring body burdens of OCPs in juveniles, scute OCP concentrations were compared against adipose tissue OCP concentrations. The percentage of OCPs measured at quantifiable levels in adipose tissue was 3-fold greater than that of scutes. The differences were likely related to differences in lipid content, as adipose tissue (range; 43.8-80.2%) has much higher lipid content compared to scute

(0.13-2.2%). For example, 4,4-DDE was detected at measurable levels in 100% of the fat samples, but only 66% of scute samples. Given the differences in detectability between fat and scutes, scutes are not a reliable indicator of OCP body burdens in juvenile alligators.

Pig Frogs and OCP concentrations

A total of 80 pig frogs (*Rana grylio*) were collected for OCP analysis. Twenty frogs were collected from each of the four major study areas. The frogs were captured by hand or in traps, and then sacrificed using Benzocaine in dental anesthetic (Chen and Combs 1999). After death, the frogs were wrapped in aluminum foil, and then placed in individual sealed plastic bags. These were labeled and stored frozen at the SJRWMD field office until they were sent to Pace Laboratories with a chain of custody. Comparisons between NSRA and Lake Apopka frogs indicated that only 4,4'-DDE and oxychlordane differed between the two sites with NSRA frogs having significantly higher concentrations of both (Table 4). Comparisons among the NSRA units and Lake Apopka showed that all OCP analytes differed between at least one or more units (Table 5). Frogs from the West Marsh unit of the NSRA had consistently higher levels of OCPs, while frogs from Lake Apopka and the Duda Unit of the NSRA had consistently lower levels. Unit 2 West frogs showed a high degree of variability with high levels of DDT analogs, but low levels of gamma-chlordane, lindane, and endrin aldehyde.

With respect to risk to avian wildlife that may consume frogs, the frogs contained OCP concentrations which were well below the OCP concentrations (in fish) used as a benchmark for assessing sublethal effects in birds (USFWS 2002). Indeed, the maximum amount of 4,4'-DDE measured in any frog was 170 ng/g wet weight, 3.2 ng/g wet weight for dieldrin, 130 ng/g wet weight for toxaphene, and 21.7 ng/g wet weight for total chlordane. With respect to risk to amphibians, these maximum values are well below body burden concentrations known to cause mortality. For example, dieldrin body burdens associated with mortality in juvenile African clawed frogs was 8,000 ng/g wet weight (Peakall 1996). Dividing the maximum dieldrin body burden in our study (130 ng/g wet weight) by the toxicity benchmark value of 8,000 ng/g wet weight equals a risk quotient of 0.016, meaning that the risk of mortality due to dieldrin exposure is very low.

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Table 1. Median (Quartile1-Quartile3) Lipid (%) and OCP concentrations (ng/g wet weight) in alligator eggs collected from the NSRA and Lake Apopka during the 2007 nesting season.

Constituent	Lake Apopka	NSRA
Lipid	17.85 (15.7-18.9)	16.9 (15.2-18.7)
4,4'-DDD	11 (7.1-14) *	25 (6-350)
4,4'-DDE	2100 (730-8300) *	6750 (2900-14000)
4,4'-DDT	6.55 (3.7-12)	6.5 (3.2-10)
4,4'-DDTr[1]	152.01 (53.53-589.13) *	490.55 (206.33-1037.33)
4,4'-DDTx[2]	2118.65 (740.7-8347) *	6901.55 (2921-14424)
Dieldrin	72.5 (11-210) *	155 (59-330)
Endosulfan II	3.28 (0.95-10) *	9 (3.5-29)
Endrin	2.9 (1.5-8.5)	5.25 (1.95-11.5)
Endrin Aldehyde	8.8 (3.2-26) *	18.75 (9.2-35)
Heptachlor Epoxide	6.15 (2.5-18) *	13 (4.9-34.5)
Oxychlordane	16.5 (3.2-65) *	56 (16-97)
Toxaphene	375 (190-990) *	885 (400-2300)
alpha-Chlordane	18.5 (5.1-36) *	48.5 (11-270)
cis-nonachlor	59 (17-170)	61 (32-220)
gamma-Chlordane	3.7 (1.25-10) *	11.25 (4.5-64)
trans-Nonachlor	66 (18-210) *	175 (76-680)
Total Chlordane[3]	169.85 (53.8-494.9) *	400.49 (179.2-1379.5)

*indicates significant differences between groups ($p<0.05$).

[1] DDTr = DDT+DDD/5+DDE/15

[2]DDTx = DDT+DDD+DDE

[3]Total chlordane = *alpha*-chlordane+*cis*-nonachlor+*gamma*-chlordane+heptachlor +Oxychlordane+*trans*-nonachlor+heptachlor epoxide

Table 2. Median (Q1-Q3) Lipid (%) and OCP concentrations (ng/g wet weight) in alligator eggs collected from the NSRA units and Lake Apopka during the 2007 nesting season.

Constituent	Lake Apopka	Duda	Unit 2 West	West Marsh
Lipid	17.85 (15.7-18.9)	15.4 (13.2-16.9)	17.1 (15.7-19.2)	17.9 (16.45-19.2)
4,4'-DDD	11 (7.1-14) B1	5 (1.4-25) B	8 (6-18) B	365 (255-440) A
4,4'-DDE	2100 (730-8300) B	1800 (820-10000) B	6400 (4000-12000) AB	12000 (6450-15000) A
4,4'-DDT	6.55 (3.7-12)	3.9 (0.85-12)	5.5 (4.6-8)	7.25 (4.18-9.75)
4,4'-DDTr[2]	152.01 (53.53-589.13) B	128.9 (56.81-684.27) B	441.87 (272.27-812.1) AB	927.45 (490.55-1099.5) A
4,4'-DDTx[3]	2118.65 (740.7-8347) B	1828.9 (823.9-10040) B	6428 (4009.6-12021.7) AB	12579.45 (6714.55-15427.5) A
Dieldrin	72.5 (11-210) B	51 (34-120) B	200 (120-330) AB	240 (155-475) A
Endosulfan II	3.28 (0.95-10) B[1]	2.6 (1.4-15) B	6 (3.5-7.5) B	26.5 (12.5-47.5) A
Endrin	2.9 (1.5-8.5) B	1.95 (0.85-4.8) B	4.6 (1.2-5.5) B	13.75 (6.85-25) A
Endrin Aldehyde	8.8 (3.2-26)	7.5 (3.25-19.5)	19 (10-22.5)	27.25 (15.5-36)
Heptachlor Epoxide	6.15 (2.5-18) B	4 (2.4-23) B	5.5 (4.9-13) B	35.5 (21.5-49.5) A
Oxychlordane	16.5 (3.2-65) B	47 (12-84) AB	32 (16-62) AB	86 (41-120) A
Toxaphene	375 (190-990) B	430 (130-940) B	440 (360-720) B	2250 (1500-3100) A
alpha-Chlordane	18.5 (5.1-36) B	16 (4.6-36) B	12 (7.1-17) B	270 (140-335) A
cis-nonachlor	59 (17-170) B	40 (9.3-150) B	37 (31-49) B	210 (108.5-320) A
gamma-Chlordane	3.7 (1.25-10) B	3.9 (1.2-10) B	11 (5.5-12) B	64.5 (36-87) A
trans-Nonachlor	66 (18-210) B	76 (18-370) B	85 (63-140) B	545 (310-825) A
Total Chlordane[4]	169.85 (53.8-494.9) B	193.4 (47.61-688.8) B	216 (151.6-305.9) B	1252 (648.9-1795.5) A

[1]medians with different letters are significantly different ($p<0.05$).

[2] DDTr = DDT+DDD/5+DDE/15

3 DDTx = DDT+DDD+DDE

[4]Total chlordane = *alpha*-chlordane+*cis*-nonachlor+*gamma*-chlordane+heptachlor +Oxychlordane+*trans*-nonachlor+heptachlor epoxide

Table 3. Median (Q1-Q3) Lipid (%) and OCP concentrations (ng/g wet weight) in juvenile alligators from the NSRA and Lake Apopka during spring/summer 2007 nesting season.

		NSRA		Lake Apopka	
Tissue	Constiuent	N	median (Q1-Q3)	N	median (Q1-Q3)
Fat	Lipid	8	71.85 (48.9- 78.95)	3	50.2 (47.5- 63.2)
	4,4'-DDD	8	195 (37.5- 305)	3	11.5 (8- 14.5)
	4,4'-DDE	8	27500 (13150- 58000)	3	11000 (8100- 15000)
	4,4'-DDT	8	40.25 (12.25- 61.5)	3	11.5 (9- 30)
	4,4'-DDTr[1]	8	1812.5 (619.17- 1981.83)	3	381.07 (286.6- 511.3)
	4,4'-DDTx[2]	8	25816.5 (8098.5- 29120.5)	3	5526 (4073- 7520.5)
	Aldrin	8	13.25 (6.2- 23.25)	3	8.5 (6- 11)
	alpha-BHC	8	10.25 (4- 23.25)	3	9.5 (6.5- 12)
	alpha-Chlordane	8	137.5 (18.2- 335)	3	8 (4.5- 80)
	cis-nonachlor	8	315 (60.5- 520)	3	91 (42- 360)
	Dieldrin	8	380 (94.5- 575)	3	66 (28- 1600)
	Endosulfan II	8	55 (11.1- 80)	3	14.5 (8- 33)
	Heptachlor Epoxide	8	22.25 (7.15- 55.75)	3	32 (6.5- 42)
	Oxychlordane	8	200 (102.5- 635)	3	84 (40- 330)
	Total Chlordane	8	1200.5 (318.65- 2471.25)	3	209.5 (135- 1176)
	Toxaphene	8	3100 (1210- 5400)	3	1300 (870- 1900)
	trans-Nonachlor	8	915 (244.5- 1400)	3	170 (80- 1500)
Blood	Lipid (%)	4	0.15 (0.13- 0.16)	2	0.18 (0.17- 0.19)
	4,4'-DDD	4	0.38 (0.27- 1.69)	2	0.25 (0.25- 0.25)
	4,4'-DDE	4	44.5 (25- 94.5)	2	13 (13- 13)
	4,4'-DDT	4	0.21 (0.19- 0.3)	2	0.19 (0.19- 0.19)
	4,4'-DDTr	4	1.85 (1.09- 3.62)	2	0.67 (0.67- 0.67)
	4,4'-DDTx	4	22.93 (12.98- 48.49)	2	6.94 (6.94- 6.94)
	Aldrin	4	0.2 (0.18- 0.28)	2	0.18 (0.18- 0.18)
	alpha-BHC	4	3.4 (2.9- 4.5)	2	3 (2.7- 3.3)
	alpha-Chlordane	4	0.54 (0.39- 1.13)	2	0.14 (0.14- 0.14)
	cis-nonachlor	4	0.55 (0.38- 1.18)	2	0.17 (0.17- 0.17)

		NSRA		Lake Apopka	
Tissue	Constiuent	N	median (Q1-Q3)	N	median (Q1-Q3)
	Dieldrin	4	0.81 (0.62- 1.45)	2	0.16 (0.16- 0.16)
	Endosulfan II	4	0.27 (0.25- 0.38)	2	0.25 (0.25- 0.25)
	Heptachlor Epoxide	4	0.21 (0.2- 0.3)	2	0.2 (0.2- 0.2)
	Oxychlordane	4	0.81 (0.55- 1.08)	2	0.23 (0.23- 0.23)
	Total Chlordane[3]	4	5.13 (3.49- 7.92)	2	1.46 (1.46- 1.46)
	Toxaphene	4	24.75 (17.5- 36.25)	2	16 (16- 16)
	trans-Nonachlor	4	1.34 (0.57- 2.95)	2	0.19 (0.19- 0.19)
Liver	Lipid	4	2.74 (1.83- 3.44)	2	1.5 (1.28- 1.71)
	4,4'-DDD	4	15.5 (6.78- 57.5)	2	0.55 (0.55- 0.55)
	4,4'-DDE	4	985 (615- 2150)	2	120.5 (91- 150)
	4,4'-DDT	4	4.15 (1.24- 12.85)	2	0.81 (0.42- 1.2)
	4,4'-DDTr	4	81.62 (41.59- 105.28)	2	4.64 (3.74- 5.53)
	4,4'-DDTx	4	1013.35 (560.34- 1368.55)	2	61.31 (46.65- 75.97)
	Aldrin	4	1.83 (0.98- 2.85)	2	0.4 (0.4- 0.4)
	alpha-BHC	4	5.9 (2.78- 11.35)	2	0.44 (0.44- 0.45)
	alpha-Chlordane	4	8.9 (2- 25.5)	2	0.53 (0.3- 0.77)
	cis-nonachlor	4	15.1 (5.5- 34.5)	2	1.49 (0.97- 2)
	Dieldrin	4	13.25 (5.5- 26)	2	0.35 (0.35- 0.35)
	Endosulfan II	4	6.3 (2.73- 7.85)	2	0.55 (0.55- 0.55)
	Heptachlor Epoxide	4	0.48 (0.45- 1.08)	2	0.42 (0.42- 0.43)
	Oxychlordane	4	8.45 (6.15- 20.25)	2	0.5 (0.5- 0.5)
	Total Chlordane	4	78.92 (31.93- 164.82)	2	5.71 (4.27- 7.15)
	Toxaphene	4	210 (112.5- 405)	2	35.25 (35- 35.5)
	trans-Nonachlor	4	32 (15.5- 72.5)	2	1.45 (1.2- 1.7)
Muscle	Lipid	4	0.59 (0.25- 3.14)	2	0.5 (0.23- 0.76)
	4,4'-DDD	4	12.8 (0.54- 25.5)	2	0.63 (0.6- 0.65)
	4,4'-DDE	4	590 (116- 1400)	2	63 (16- 110)
	4,4'-DDT	4	0.52 (0.43- 2.48)	2	0.49 (0.48- 0.5)
	4,4'-DDTr	4	21.54 (4.4- 82.94)	2	2.71 (1.13- 4.29)
	4,4'-DDTx	4	302.32 (58.97- 1171.48)	2	32.61 (9.08- 56.15)

		NSRA		Lake Apopka	
Tissue	Constiuent	N	median (Q1-Q3)	N	median (Q1-Q3)
	Aldrin	4	0.51 (0.41- 0.73)	2	0.46 (0.46- 0.47)
	alpha-BHC	4	0.8 (0.5- 1.3)	2	0.5 (0.5- 0.5)
	alpha-Chlordane	4	7.75 (1.18- 21.5)	2	0.34 (0.34- 0.35)
	cis-nonachlor	4	7.99 (0.91- 27.5)	2	1.16 (0.41- 1.9)
	Dieldrin	4	6.2 (1.59- 22)	2	0.41 (0.4- 0.41)
	Endosulfan II	4	0.68 (0.54- 1.98)	2	0.63 (0.6- 0.65)
	Heptachlor Epoxide	4	0.55 (0.43- 0.78)	2	0.49 (0.49- 0.5)
	Oxychlordane	4	2.35 (1.13- 37)	2	0.58 (0.55- 0.6)
	Total Chlordane	4	42.74 (9.06- 152.6)	2	4.02 (3.6- 4.45)
	Toxaphene	4	130.25 (35.75- 370)	2	40.5 (40- 41)
	trans-Nonachlor	4	19.95 (2.25- 57.5)	2	0.89 (0.47- 1.3)
Scute	Lipid	8	0.64 (0.4- 1.14)	4	1.25 (0.44- 1.88)
	4,4'-DDD	8	4.7 (3.8- 11)	4	7.9 (2.68- 14.5)
	4,4'-DDE	8	40.5 (19.75- 370)	4	18.5 (13.5- 45.5)
	4,4'-DDT	8	3.65 (2.98- 5.88)	4	6.05 (2.1- 11.25)
	4,4'-DDTr	8	9.46 (5.2- 18.69)	4	9.33 (3.99- 15.38)
	4,4'-DDTx	8	32.63 (23.85- 196.68)	4	39.45 (23.58- 45.7)
	Aldrin	8	3.45 (2.8- 5.78)	4	5.73 (2- 10.5)
	alpha-BHC	8	8.95 (3.85- 14)	4	6.35 (2.2- 11.75)
	alpha-Chlordane	8	5.1 (2.58- 7.65)	4	4.15 (1.48- 7.75)
	cis-nonachlor	8	3.13 (2.53- 7.25)	4	5.1 (1.78- 9.5)
	Dieldrin	8	4.8 (2.7- 7.55)	5	8 (1.35- 10.5)
	Endosulfan II	8	4.68 (3.8- 7.75)	4	7.9 (2.68- 14.5)
	Heptachlor Epoxide	8	3.7 (3- 5.9)	4	6.05 (2.13- 11.25)
	Oxychlordane	8	4.33 (3.5- 9.5)	4	7.28 (2.48- 13.25)
	Total Chlordane	8	47 (27.73- 64.25)	4	46 (15.85- 84.75)
	Toxaphene	8	240 (217.5- 625)	4	480 (130- 925)
	trans-Nonachlor	8	7.5 (3.18- 9.5)	4	6 (2.03- 11)
Stomach	Lipid	1	3.49 (3.49- 3.49)	0	NA
	4,4'-DDD	1	130 (130- 130)	0	NA
	4,4'-DDE	1	810 (810- 810)	0	NA

		NSRA		Lake Apopka	
Tissue	Constiuent	N	median (Q1-Q3)	N	median (Q1-Q3)
	4,4'-DDT	1	0.6 (0.6- 0.6)	0	NA
	4,4'-DDTr	1	81.2 (81.2- 81.2)	0	NA
	4,4'-DDTx	1	941.2 (941.2- 941.2)	0	NA
	Aldrin	1	0.55 (0.55- 0.55)	0	NA
	alpha-BHC	1	0.6 (0.6- 0.6)	0	NA
	alpha-Chlordane	1	7 (7- 7)	0	NA
	cis-nonachlor	1	5.9 (5.9- 5.9)	0	NA
	Dieldrin	1	8.5 (8.5- 8.5)	0	NA
	Endosulfan II	1	2.8 (2.8- 2.8)	0	NA
	Heptachlor Epoxide	1	5.1 (5.1- 5.1)	0	NA
	Oxychlordane	1	3.6 (3.6- 3.6)	0	NA
	Total Chlordane	1	45.9 (45.9- 45.9)	0	NA
	Toxaphene	1	370 (370- 370)	0	NA
	trans-Nonachlor	1	21 (21- 21)	0	NA

[1] DDTr = DDT+DDD/5+DDE/15; [2] DDTx = DDT+DDD+DDE; [3]Total chlordane = *alpha*-chlordane+*cis*-nonachlor+*gamma*-chlordane+heptachlor +Oxychlordane+*trans*-nonachlor+heptachlor epoxide

Table 4. Median (Q1-Q3) Lipid (%) and OCP concentrations (ng/g wet weight) in juvenile alligators from the NSRA units and Lake Apopka during spring/summer 2007 nesting season.

		West Marsh		Duda		Unit 2		Lake Apopka	
Tissue	Chemical	N	median (Q1-Q3)	N	median (Q1-Q3)	N	median (Q1-Q3)	N	median (Q1-Q3)
Fat	Lipid	3	49.2 (48.6-75.6)	3	68.1 (43.8-77.5)	2	80.55 (80.4-80.7)	3	50.2 (47.5-63.2)
	4,4'-DDD	3	240 (60-1900)	3	150 (15-360)	2	125.9 (1.8-250)	3	11.5 (8-14.5)
	4,4'-DDE	3	58000 (58000-78000)	3	26000 (25000-29000)	2	1200 (1100-1300)	3	11000 (8100-15000)
	4,4'-DDT	3	32 (12.5-48.5)	3	56 (12-67)	2	61.35 (2.7-120)	3	11.5 (9-30)
	4,4'-DDTr[1]	3	1993.83 (1969.83-2822)	3	1752.67 (981.67-1872.33)	2	166.53 (76.39-256.67)	3	381.07 (286.6-511.3)
	4,4'-DDTx[2]	3	29132.5 (29108.5-39982)	3	25206 (14527-26427)	2	1387.25 (1104.5-1670)	3	5526 (4073-7520.5)
	Aldrin	3	30.5 (11.5-45.5)	3	15 (11-16)	2	1.38 (1.35-1.4)	3	8.5 (6-11)
	alpha-BHC	3	33.5 (13-50)	3	8 (6.5-12.5)	2	1.1 (0.7-1.5)	3	9.5 (6.5-12)
	alpha-Chlordane	3	55 (34-1000)	3	250 (220-420)	2	1.7 (1-2.4)	3	8 (4.5-80)
	cis-nonachlor	3	230 (100-1100)	3	490 (400-550)	2	14 (7-21)	3	91 (42-360)
	Dieldrin	3	580 (570-700)	3	310 (120-450)	2	47.5 (26-69)	3	66 (28-1600)
	Endosulfan II	3	60 (16-110)	3	60 (50-100)	2	5.95 (5.7-6.2)	3	14.5 (8-33)
	Heptachlor Epoxide	3	32 (12.5-48.5)	3	63 (7.5-75)	2	5.15 (3.5-6.8)	3	32 (6.5-42)
	Oxychlordane	3	200 (160-200)	3	840 (430-970)	2	39 (33-45)	3	84 (40-330)
	Total Chlordane[3]	3	1211 (557.5-5444)	3	1595.5 (1190-3347)	2	78.85 (77.9-79.8)	3	209.5 (135-1176)
	Toxaphene	3	3900 (1900-7700)	3	3500 (2700-6900)	2	435 (350-520)	3	1300 (870-1900)
	trans-Nonachlor	3	630 (410-2700)	3	1300 (1200-1500)	2	52 (25-79)	3	170 (80-1500)
Scute	Lipid	3	0.87 (0.49-2.22)	3	0.31 (0.19-1.4)	2	0.64 (0.54-0.73)	4	1.25 (0.44-1.88)

		West Marsh		Duda		Unit 2		Lake Apopka	
Tissue	Chemical	N	median (Q1-Q3)	N	median (Q1-Q3)	N	median (Q1-Q3)	N	median (Q1-Q3)
	4,4'-DDD	3	4.85 (3.3-44)	3	4.55 (3.8-10)	2	7.9 (3.8-12)	4	7.9 (2.68-14.5)
	4,4'-DDE	3	550 (38-2700)	3	43 (24-190)	2	10.2 (4.9-15.5)	4	18.5 (13.5-45.5)
	4,4'-DDT	3	3.75 (2.55-4.25)	3	3.55 (2.95-7.5)	2	6.25 (3-9.5)	4	6.05 (2.1-11.25)
	4,4'-DDTr	3	21.54 (5.99-197.3)	3	5.26 (5.14-15.83)	2	8.51 (4.09-12.93)	4	9.33 (3.99-15.38)
	4,4'-DDTx	3	280.85 (27.6-2752.5)	3	28.25 (20.1-112.5)	2	24.35 (11.7-37)	4	39.45 (23.58-45.7)
	Aldrin	3	3.55 (2.4-4.05)	3	3.35 (2.8-7.5)	2	5.9 (2.8-9)	4	5.73 (2-10.5)
	alpha-BHC	3	8.2 (3.95-25)	3	9.7 (3.75-18)	2	6.58 (3.15-10)	4	6.35 (2.2-11.75)
	alpha-Chlordane	3	8.8 (2.65-46)	3	4.7 (2.5-5.5)	2	4.3 (2.1-6.5)	4	4.15 (1.48-7.75)
	cis-nonachlor	3	3.2 (2.2-32)	3	3.05 (2.5-6.5)	2	5.28 (2.55-8)	4	5.1 (1.78-9.5)
	Dieldrin	3	7.1 (3.1-19)	3	2.95 (2.45-6.5)	2	5.23 (2.45-8)	5	8 (1.35-10.5)
	Endosulfan II	3	4.8 (3.3-5.5)	3	4.55 (3.8-10)	2	7.9 (3.8-12)	4	7.9 (2.68-14.5)
	Heptachlor Epoxide	3	3.8 (2.6-4.3)	3	3.6 (3-7.5)	2	6.25 (3-9.5)	4	6.05 (2.13-11.25)
	Oxychlordane	3	4.45 (3-10)	3	4.2 (3.5-9)	2	7.25 (3.5-11)	4	7.28 (2.48-13.25)
	Solids, Percent	3	22.3 (22-25)	3	25 (24.9-25.8)	2	23.85 (21.6-26.1)	4	22.2 (20.45-26.7)
	Total Chlordane	3	49 (28.35-105.25)	3	45 (27.1-58)	2	46.4 (22.3-70.5)	4	46 (15.85-84.75)
	Toxaphene	3	235 (215-1100)	3	245 (220-650)	2	392.5 (185-600)	4	480 (130-925)
	trans-Nonachlor	3	10 (7.5-90)	3	3.45 (2.9-7.5)	2	5.95 (2.9-9)	4	6 (2.03-11)
Blood	Lipid	2	0.15 (0.15-0.15)	2	0.14 (0.11-0.16)			2	0.18 (0.17-

		West Marsh		Duda		Unit 2		Lake Apopka	
Tissue	Chemical	N	median (Q1-Q3)	N	median (Q1-Q3)	N	median (Q1-Q3)	N	median (Q1-Q3)
									0.19)
	4,4'-DDD	2	1.69 (0.47-2.9)	2	0.27 (0.25-0.29)			2	0.25 (0.25-0.25)
	4,4'-DDE	2	94.5 (59-130)	2	25 (20-30)			2	13 (13-13)
	4,4'-DDT	2	0.28 (0.19-0.37)	2	0.21 (0.19-0.23)			2	0.19 (0.19-0.19)
	4,4'-DDTr	2	3.62 (2.43-4.81)	2	1.09 (0.91-1.28)			2	0.67 (0.67-0.67)
	4,4'-DDTx	2	48.49 (30.34-66.64)	2	12.98 (10.44-15.52)			2	6.94 (6.94-6.94)
	Aldrin	2	0.26 (0.18-0.35)	2	0.2 (0.18-0.22)			2	0.18 (0.18-0.18)
	alpha-BHC	2	4 (2.8-5.2)	2	3.4 (3-3.8)			2	3 (2.7-3.3)
	alpha-Chlordane	2	0.98 (0.26-1.7)	2	0.54 (0.52-0.56)			2	0.14 (0.14-0.14)
	cis-nonachlor	2	1.01 (0.31-1.7)	2	0.55 (0.44-0.66)			2	0.17 (0.17-0.17)
	Dieldrin	2	1.45 (1-1.9)	2	0.62 (0.62-0.62)			2	0.16 (0.16-0.16)
	Endosulfan II	2	0.36 (0.25-0.47)	2	0.27 (0.25-0.29)			2	0.25 (0.25-0.25)
	Heptachlor Epoxide	2	0.28 (0.2-0.37)	2	0.21 (0.2-0.23)			2	0.2 (0.2-0.2)
	Oxychlordane	2	0.55 (0.43-0.66)	2	1.08 (0.95-1.2)			2	0.23 (0.23-0.23)
	Solids, Percent	2	13.65 (11.8-15.5)	2	13.15 (10.1-16.2)			2	11.85 (10.6-13.1)
	Total Chlordane	2	6.29 (2.76-9.81)	2	5.13 (4.22-6.03)			2	1.46 (1.46-1.46)
	Toxaphene	2	36.25 (30.5-42)	2	17.5 (16-19)			2	16 (16-16)

		West Marsh		Duda		Unit 2		Lake Apopka	
Tissue	Chemical	N	median (Q1-Q3)	N	median (Q1-Q3)	N	median (Q1-Q3)	N	median (Q1-Q3)
	trans-Nonachlor	2	2.18 (0.36-4)	2	1.34 (0.78-1.9)			2	0.19 (0.19-0.19)
Liver	Lipid	2	2.74 (2.67-2.8)	2	2.54 (0.99-4.08)			2	1.5 (1.28-1.71)
	4,4'-DDD	2	55 (13-97)	2	9.28 (0.55-18)			2	0.55 (0.55-0.55)
	4,4'-DDE	2	2135 (970-3300)	2	630 (260-1000)			2	120.5 (91-150)
	4,4'-DDT	2	4.15 (1.6-6.7)	2	9.94 (0.87-19)			2	0.81 (0.42-1.2)
	4,4'-DDTr	2	97.63 (73.97-121.3)	2	49.24 (9.21-89.27)			2	4.64 (3.74-5.53)
	4,4'-DDTx	2	1344.9 (989.7-1700.1)	2	583.99 (130.99-1037)			2	61.31 (46.65-75.97)
	Aldrin	2	2.58 (1.55-3.6)	2	1.26 (0.42-2.1)			2	0.4 (0.4-0.4)
	alpha-BHC	2	5.9 (5.1-6.7)	2	8.23 (0.46-16)			2	0.44 (0.44-0.45)
	alpha-Chlordane	2	19.4 (2.8-36)	2	8.1 (1.2-15)			2	0.53 (0.3-0.77)
	cis-nonachlor	2	25.6 (6.2-45)	2	14.4 (4.8-24)			2	1.49 (0.97-2)
	Dieldrin	2	26 (19-33)	2	5.5 (3.5-7.5)			2	0.35 (0.35-0.35)
	Endosulfan II	2	6.45 (4.9-8)	2	4.13 (0.55-7.7)			2	0.55 (0.55-0.55)
	Heptachlor Epoxide	2	1.05 (0.45-1.65)	2	0.47 (0.44-0.5)			2	0.42 (0.42-0.43)
	Oxychlordane	2	6.15 (3.9-8.4)	2	20.25 (8.5-32)			2	0.5 (0.5-0.5)
	Solids, Percent	1	22.9 (22.9-22.9)	2	19.95 (15.3-24.6)			2	23.2 (22.7-23.7)
	Total Chlordane	2	117.83 (29.96-205.7)	2	78.92 (33.89-123.94)			2	5.71 (4.27-7.15)
	Toxaphene	2	335 (140-530)	2	182.5 (85-280)			2	35.25 (35-35.5)
	trans-Nonachlor	2	56 (15-97)	2	32 (16-48)			2	1.45 (1.2-1.7)

		West Marsh		Duda		Unit 2		Lake Apopka	
Tissue	Chemical	N	median (Q1-Q3)	N	median (Q1-Q3)	N	median (Q1-Q3)	N	median (Q1-Q3)
Muscle	Lipid	2	0.59 (0.33-0.84)	2	2.81 (0.17-5.44)			2	0.5 (0.23-0.76)
	4,4'-DDD	2	13.3 (0.6-26)	2	12.74 (0.48-25)			2	0.63 (0.6-0.65)
	4,4'-DDE	2	590 (180-1000)	2	926 (52-1800)			2	63 (16-110)
	4,4'-DDT	2	0.52 (0.49-0.55)	2	2.39 (0.38-4.4)			2	0.49 (0.48-0.5)
	4,4'-DDTr	2	21.54 (6.61-36.48)	2	65.8 (2.2-129.4)			2	2.71 (1.13-4.29)
	4,4'-DDTx	2	302.32 (91.09-513.55)	2	928.13 (26.86-1829.4)			2	32.61 (9.08-56.15)
	Aldrin	2	0.51 (0.46-0.55)	2	0.63 (0.36-0.9)			2	0.46 (0.46-0.47)
	alpha-BHC	2	1.1 (0.6-1.6)	2	0.7 (0.4-1)			2	0.5 (0.5-0.5)
	alpha-Chlordane	2	7.75 (1.5-14)	2	14.93 (0.86-29)			2	0.34 (0.34-0.35)
	cis-nonachlor	2	7.92 (0.84-15)	2	20.49 (0.98-40)			2	1.16 (0.41-1.9)
	Dieldrin	2	6.2 (2.4-10)	2	17.39 (0.77-34)			2	0.41 (0.4-0.41)
	Endosulfan II	2	0.68 (0.6-0.75)	2	1.84 (0.48-3.2)			2	0.63 (0.6-0.65)
	Heptachlor Epoxide	2	0.55 (0.49-0.6)	2	0.66 (0.38-0.95)			2	0.49 (0.49-0.5)
	Oxychlordane	2	1.78 (0.55-3)	2	36.35 (1.7-71)			2	0.58 (0.55-0.6)
	Solids, Percent	2	20.8 (20.8-20.8)	2	22.7 (21.4-24)			2	20.85 (19.7-22)
	Total Chlordane	2	42.52 (8.83-76.2)	2	119.14 (9.28-229)			2	4.02 (3.6-4.45)
	Toxaphene	2	130.25 (40.5-220)	2	275.5 (31-520)			2	40.5 (40-41)
	trans-Nonachlor	2	19.3 (1.6-37)	2	40.45 (2.9-78)			2	0.89 (0.47-1.3)
Stomach	Lipid	1	3.49 (3.49-3.49)						
	4,4'-DDD	1	130 (130-130)						
	4,4'-DDE	1	810 (810-810)						
	4,4'-DDT	1	0.6 (0.6-0.6)						
	4,4'-DDTr	1	81.2 (81.2-81.2)						

		West Marsh		Duda		Unit 2		Lake Apopka	
Tissue	Chemical	N	median (Q1-Q3)	N	median (Q1-Q3)	N	median (Q1-Q3)	N	median (Q1-Q3)
	4,4'-DDTx	1	941.2 (941.2-941.2)						
	Aldrin	1	0.55 (0.55-0.55)						
	alpha-BHC	1	0.6 (0.6-0.6)						
	alpha-Chlordane	1	7 (7-7)						
	cis-nonachlor	1	5.9 (5.9-5.9)						
	Dieldrin	1	8.5 (8.5-8.5)						
	Endosulfan II	1	2.8 (2.8-2.8)						
	Heptachlor Epoxide	1	5.1 (5.1-5.1)						
	Oxychlordane	1	3.6 (3.6-3.6)						
	Solids, Percent	1	32.2 (32.2-32.2)						
	Total Chlordane	1	45.9 (45.9-45.9)						
	Toxaphene	1	370 (370-370)						
	trans-Nonachlor	1	21 (21-21)						

[1] DDTr = DDT+DDD/5+DDE/15; [2] DDTx = DDT+DDD+DDE; [3]Total chlordane = *alpha*-chlordane+*cis*-nonachlor+*gamma*-chlordane+heptachlor +Oxychlordane+*trans*-nonachlor+heptachlor epoxide

Table 5. Median (Q1-Q3) Lipid (%) and OCP concentrations (ng/g wet weight) in pig frogs from the NSRA and Lake Apopka during spring/summer 2007. *Indicates significant differences between groups ($p<0.05$). [1] DDTr = DDT+DDD/5+DDE/15; [2] DDTx = DDT+DDD+DDE; [3]Total chlordane = *alpha*-chlordane+*cis*-nonachlor+*gamma*-chlordane+heptachlor +Oxychlordane+*trans*-nonachlor+heptachlor epoxide

Chemical	Lake Apopka	NSRA
Lipid	1.77 (1.19-2.31)	1.24 (0.87-1.69)
4,4'-DDD	0.5 (0.25-1)	0.5 (0.25-0.99)
4,4'-DDE	22 (6.9-56) *	46.5 (26.5-78)
4,4'-DDT	0.19 (0.19-0.39)	0.19 (0.19-0.39)
4,4'-DDTr[1]	2.43 (1.14-4.7)	3.74 (2.59-6.11)
4,4'-DDTx[2]	23.76 (7.77-57.77)	47.82 (28.32-79.58)
Aldrin	0.37 (0.18-0.37)	0.37 (0.18-0.68)
Dieldrin	0.32 (0.16-0.7)	0.34 (0.16-0.89)
Endosulfan I	0.15 (0.15-0.29)	0.15 (0.15-0.29)
Endrin	1.2 (0.37-1.6)	1 (0.66-2.15)
Endrin Ketone	0.31 (0.31-0.6)	0.31 (0.31-0.6)
Heptachlor	0.18 (0.18-0.36)	0.36 (0.18-0.59)
Methoxychlor	1.85 (0.95-1.85)	0.95 (0.95-1.85)
Oxychlordane	0.76 (0.23-2.4) *	1.9 (1.1-3.1)
Total Chlordane[3]	6 (2.91-7.33)	6.01 (4.92-8.08)
alpha-BHC	0.41 (0.2-0.42)	0.53 (0.2-1.15)
alpha-Chlordane	0.59 (0.14-0.74)	0.33 (0.14-0.64)
beta-BHC	0.23 (0.23-0.46)	0.27 (0.23-0.55)
cis-nonachlor	0.33 (0.17-0.68)	0.33 (0.17-0.47)
trans-Nonachlor	0.38 (0.19-0.38)	0.38 (0.19-0.66)

Table 6. Median (Q1-Q3) Lipid (%) and OCP concentrations (ng/g wet weight) in pig frogs from units within the NSRA and Lake Apopka during spring/summer 2007. [1] DDTr = DDT+DDD/5+DDE/15; [2] DDTx = DDT+DDD+DDE; [3]Total chlordane = *alpha*-chlordane+*cis*-nonachlor+*gamma*-chlordane+heptachlor +Oxychlordane+*trans*-nonachlor+heptachlor epoxide

Chemical	Lake Apopka	Duda	Unit 2	West Marsh
Lipid	1.77 (1.19-2.31)	1.27 (0.89-1.5)	1.57 (1.14-2.25)	0.98 (0.7-1.47)
4,4'-DDD	0.5 (0.25-1) B	0.25 (0.25-0.5) AB	0.64 (0.25-1.1) B	0.5 (0.25-1.05) A
4,4'-DDE	22 (6.9-56) B	24.5 (11-32.5) B	74.5 (52-104.5) A	61.5 (36.5-81) A
4,4'-DDT	0.19 (0.19-0.39) B	0.19 (0.19-0.39) AB	0.19 (0.19-0.29) B	0.19 (0.19-0.39) A
4,4'-DDTr[1]	2.43 (1.14-4.7) B	2.25 (1.21-2.82) B	5.44 (3.94-7.54) A	4.69 (3.12-6.45) A
4,4'-DDTx[2]	23.76 (7.77-57.77) B	25.73 (11.87-33.37) B	75.37 (52.87-105.83) A	62.88 (37.82-82.89) A
Aldrin	0.37 (0.18-0.37) B	0.37 (0.18-0.69) A	0.43 (0.18-0.7) AB	0.37 (0.18-0.51) A
alpha-BHC	0.41 (0.2-0.42) B	0.41 (0.2-0.8) A	0.86 (0.53-1.3) A	0.2 (0.2-1.2) A
alpha-Chlordane	0.59 (0.14-0.74)	0.27 (0.14-0.62)	0.37 (0.14-0.65)	0.36 (0.14-0.73)
beta-BHC	0.23 (0.23-0.46) B	0.55 (0.46-0.76) A	0.23 (0.23-0.24) B	0.23 (0.23-0.46) A
cis-nonachlor	0.33 (0.17-0.68) B	0.17 (0.17-0.33) B	0.57 (0.4-0.68) A	0.33 (0.17-0.33) AB
delta-BHC	0.26 (0.26-0.5) BC	0.26 (0.26-0.42) AB	0.26 (0.26-0.26) C	0.26 (0.26-0.5) A
Dieldrin	0.32 (0.16-0.7) C	0.16 (0.16-0.26) BC	0.6 (0.17-1.35) AB	0.51 (0.32-0.89) A
Endosulfan I	0.15 (0.15-0.29) B	0.15 (0.15-0.29) AB	0.15 (0.15-0.22) B	0.22 (0.15-0.29) A
Endosulfan II	0.25 (0.25-0.49) B	0.25 (0.25-0.4) AB	0.25 (0.25-0.26) B	0.25 (0.25-0.49) A
Endosulfan Sulfate	0.4 (0.4-0.8) BC	0.4 (0.4-0.45) AB	0.4 (0.4-0.4) C	0.43 (0.4-0.8) A
Endrin	1.2 (0.37-1.6) B	1.9 (0.85-3.3) A	0.95 (0.76-1.65) B	0.83 (0.48-1.25) AB
Endrin Aldehyde	0.7 (0.7-1.45) BC	0.7 (0.7-0.8) AB	0.7 (0.7-0.7) C	0.7 (0.7-1.45) A
Endrin Ketone	0.31 (0.31-0.6) B	0.31 (0.31-0.35) AB	0.76 (0.31-0.99) A	0.31 (0.31-0.6) A
gamma-BHC (Lindane)	0.14 (0.14-0.27) BC	0.14 (0.14-0.16) AB	0.14 (0.14-0.14) C	0.14 (0.14-0.27) A
gamma-Chlordane	0.37 (0.37-0.75) BC	0.37 (0.37-0.42) B	0.37 (0.37-0.37) C	0.37 (0.37-0.75) A
Heptachlor	0.18 (0.18-0.36)	0.18 (0.18-0.36)	0.59 (0.41-1.08)	0.36 (0.18-0.39)

	C	BC	A	AB
Heptachlor	0.2 (0.2-0.39)			
Epoxide	BC	0.2 (0.2-0.22) B	0.2 (0.2-0.2) C	0.2 (0.2-0.39) A
	1.85 (0.95-1.85)	0.95 (0.95-1.08)		1.85 (0.95-1.85)
Methoxychlor	B	B	0.95 (0.95-1.4) B	A
	0.76 (0.23-2.4)			1.1 (0.64-1.6)
Oxychlordane	C	2.65 (1.25-4) A	2.35 (1.7-3.1) AB	BC
		5.56 (4.81-8.65)	6.14 (5.42-7.91)	
Total Chlordane[3]	6 (2.91-7.33) B	A	AB	6.08 (3.6-7.2) A
Toxaphene	16 (16-24) B	12 (12-13.75) B	12 (12-14.5) B	16 (16-24) A
	0.38 (0.19-0.38)	0.52 (0.28-0.88)	0.52 (0.19-0.92)	0.19 (0.19-0.38)
trans-Nonachlor	B	A	AB	AB

APPENDIX B
RAW DATA FROM ALLIGATOR NIGHT LIGHT SURVEYS IN 2007-2009

Appendix B-1: Night-light survey tables 2007-2009.

Appendix B-1a: Raw alligator night-light survey data for Lake Apopka, Duda, and the West Marsh for 2007. The table represents the number of alligators observed in 30 cm (1 ft) size classes. Alligators that could not be placed in a size class were assigned to a broad size class or the unknown size class.

	Lake Apopka		West Marsh		Duda	
Size Class (cm.)	**22-May**	**13-Jun**	**29-May**	**13-Jun**	**29-May**	**13-Jun**
Hatchlings	261	0	0	11	16	15
30-61	508	721	17	2	0	0
61-91	471	447	11	22	3	13
91-122	151	168	20	14	9	2
122-152	79	94	10	9	2	0
152-183	71	57	9	28	0	1
183-213	65	61	33	12	0	1
213-244	28	35	23	6	0	0
244-274	11	9	8	6	0	0
274-305	12	7	5	7	0	0
305-335	10	8	4	3	0	0
335-366	7	2	4	0	0	0
366-396	5	0	0	0	0	0
396+	0	0	0	0	0	0
Unknown	5	0	1	11	4	0
Unk 0-60	15	0	0	0	0	0
Unk 61-122	10	6	2	21	1	4
Unk 122-183	0	0	0	11	0	1
Unk 122+	46	17	4	25	1	1
Unk 183+	147	200	57	10	9	3
Unk 274+	11	4	7	1	0	0
Total	1913	1836	215	199	45	41
0-122	1416	1342	50	70	29	34
122+	492	494	164	118	12	7

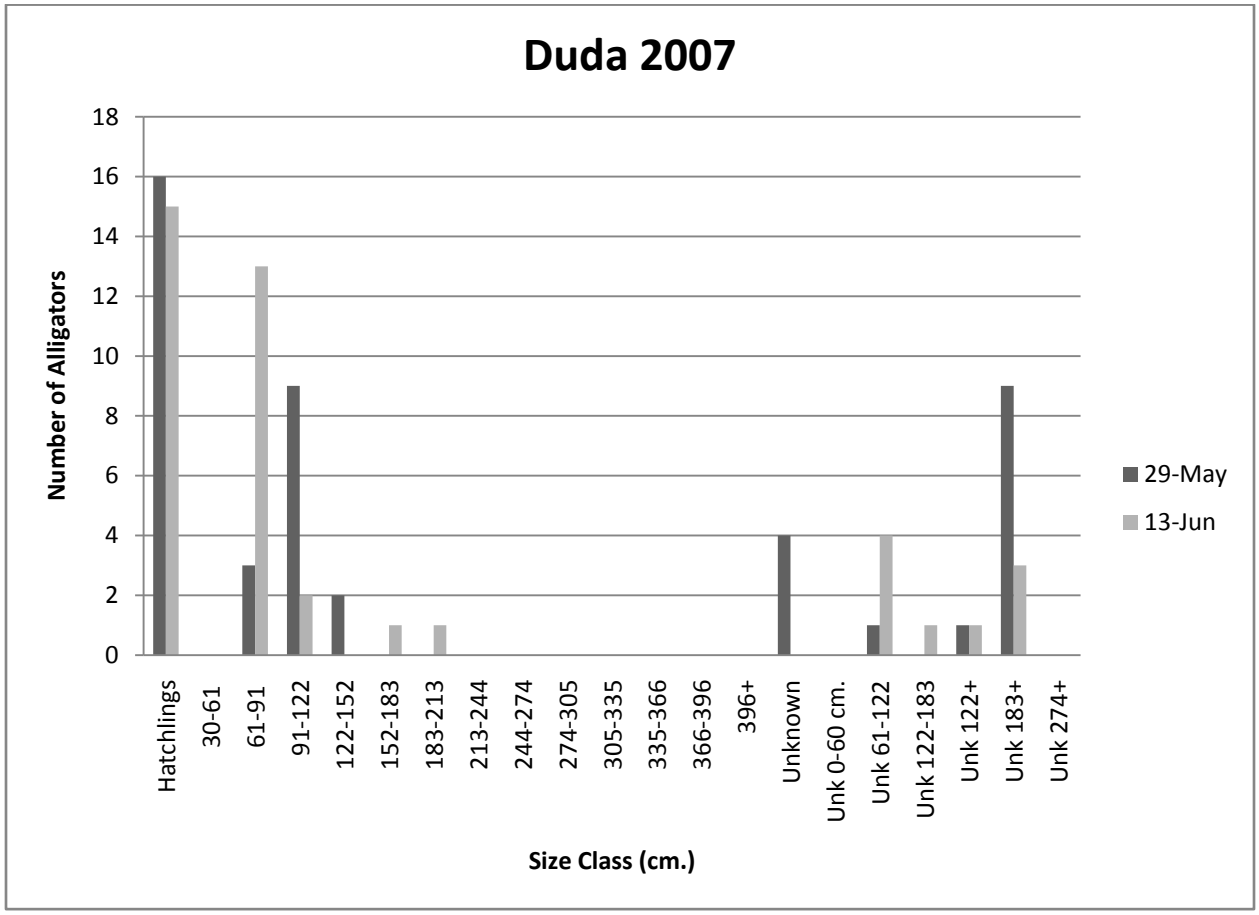
Appendix B-1b: Alligator night light survey data for Phase 1, Duda, and the West Marsh for 2008. The table represents the number of alligators observed in 30 cm (1 ft) size classes. Alligators that could not be placed in a size class were assigned to a broad size class or the unknown size class.

	Phase 1			Duda			West Marsh		
Size Class (cm.)	**24-Apr**	**1-Jun**	**10-Jul**	**24-Apr**	**30-May**	**7-Jul**	**24-Apr**	**30-May**	**7-Jul**
Hatchlings	0	0	0	0	0	1	8	11	6
30-61	8	6	4	2	6	1	0	21	15
61-91	10	35	58	20	21	7	0	23	19
91-122	1	37	39	6	4	4	1	8	10
122-152	1	12	12	0	5	1	0	9	6
152-183	1	5	6	2	4	3	1	7	5
183-213	0	0	2	2	3	1	12	12	14
213-244	0	1	0	1	0	0	9	9	5
244-274	0	0	0	2	1	0	7	8	6
274-305	0	0	0	2	0	1	4	5	3
305-335	0	0	0	1	2	0	5	3	2
335-366	0	0	0	1	1	0	1	1	2
366-396	0	0	0	0	0	0	0	0	0
396+	0	0	0	0	0	0	0	0	0
Unknown	6	10	13	9	4	1	15	12	13
Unk 0-60	0	0	2	0	0	0	0	0	2
Unk 61-122	1	25	27	2	2	3	2	12	5
Unk 122-183	0	1	1	1	7	2	2	10	8
Unk 122+	5	11	7	2	6	2	15	21	17
Unk 183+	4	10	0	5	6	2	21	19	32
Unk 274+	0	0	0	0	1	1	2	1	6
Total	37	153	171	58	73	30	105	192	176
0-122	20	103	130	30	33	16	11	75	57
122+	11	40	28	19	36	13	79	105	106

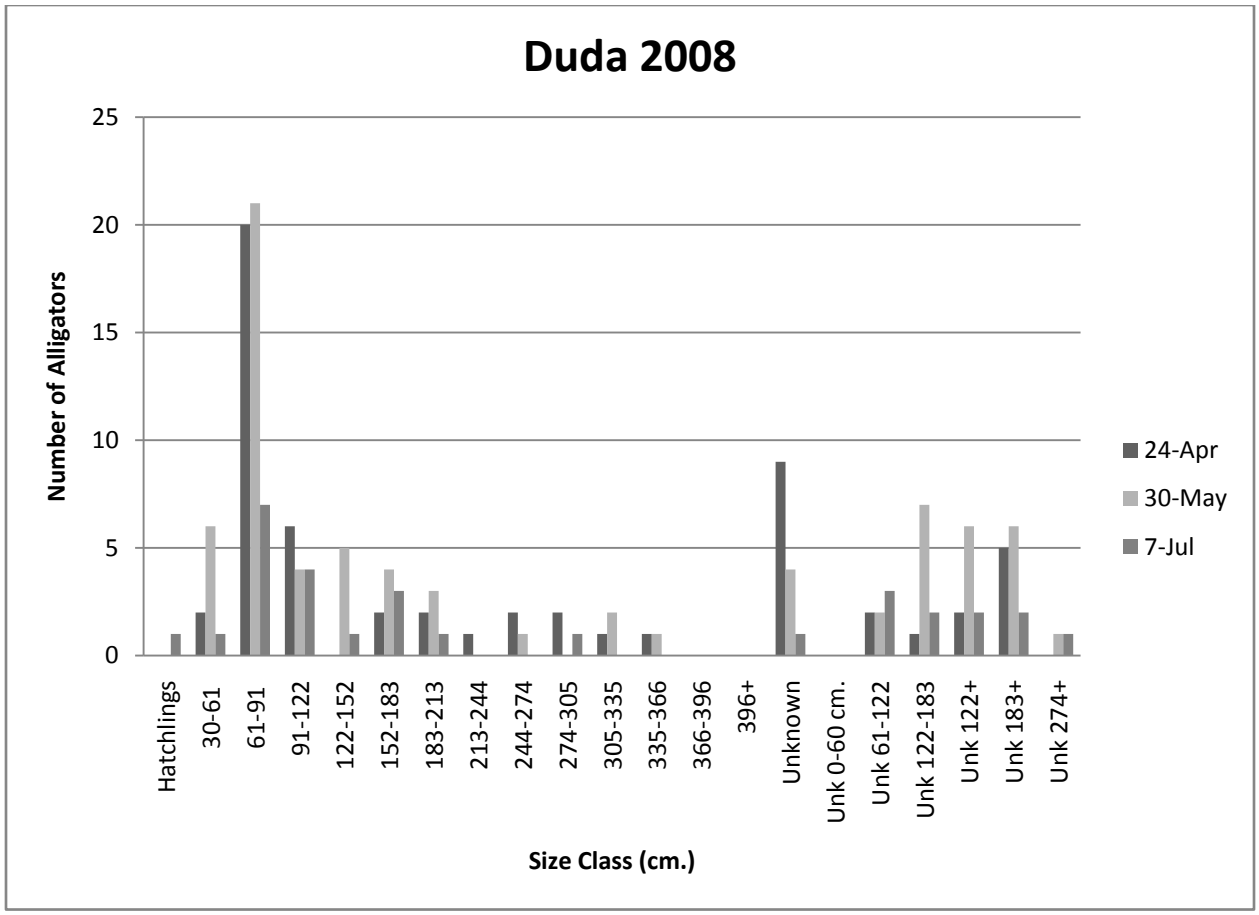
Appendix B-1c: Alligator night light survey data for Phase 1, Duda, and the West Marsh for 2009. The table represents the number of alligators observed in 30 cm (1 ft) size classes. Alligators that could not be placed in a size class were assigned to a broad size class or the unknown size class.

	Phase 1		Duda	West Marsh	
Size Class (cm.)	**12-May**	**4-Jun**	**6-Jun**	**11-May**	**4-Jun**
Hatchlings	19	0	0	12	2
30-61	16	17	1	11	2
61-91	96	16	0	30	2
91-122	89	25	0	11	2
122-152	26	11	0	6	1
152-183	9	10	1	5	2
183-213	5	4	0	5	3
213-244	3	3	3	5	11
244-274	0	0	1	5	10
274-305	0	0	0	5	3
305-335	0	0	0	2	3
335-366	0	0	0	3	1
366-396	0	0	0	1	1
396+	0	0	0	0	0
Unknown	10	4	0	0	1
Unk 0-60	1	1	0	0	0
Unk 61-122	38	33	0	6	5
Unk 122-183	1	0	0	0	3
Unk 122+	9	15	3	43	10
Unk 183+	3	1	2	44	30
Unk 274+	0	0	0	2	3
Total	325	140	11	196	95
0-122	70	13	1	70	13
122+	126	81	10	126	81

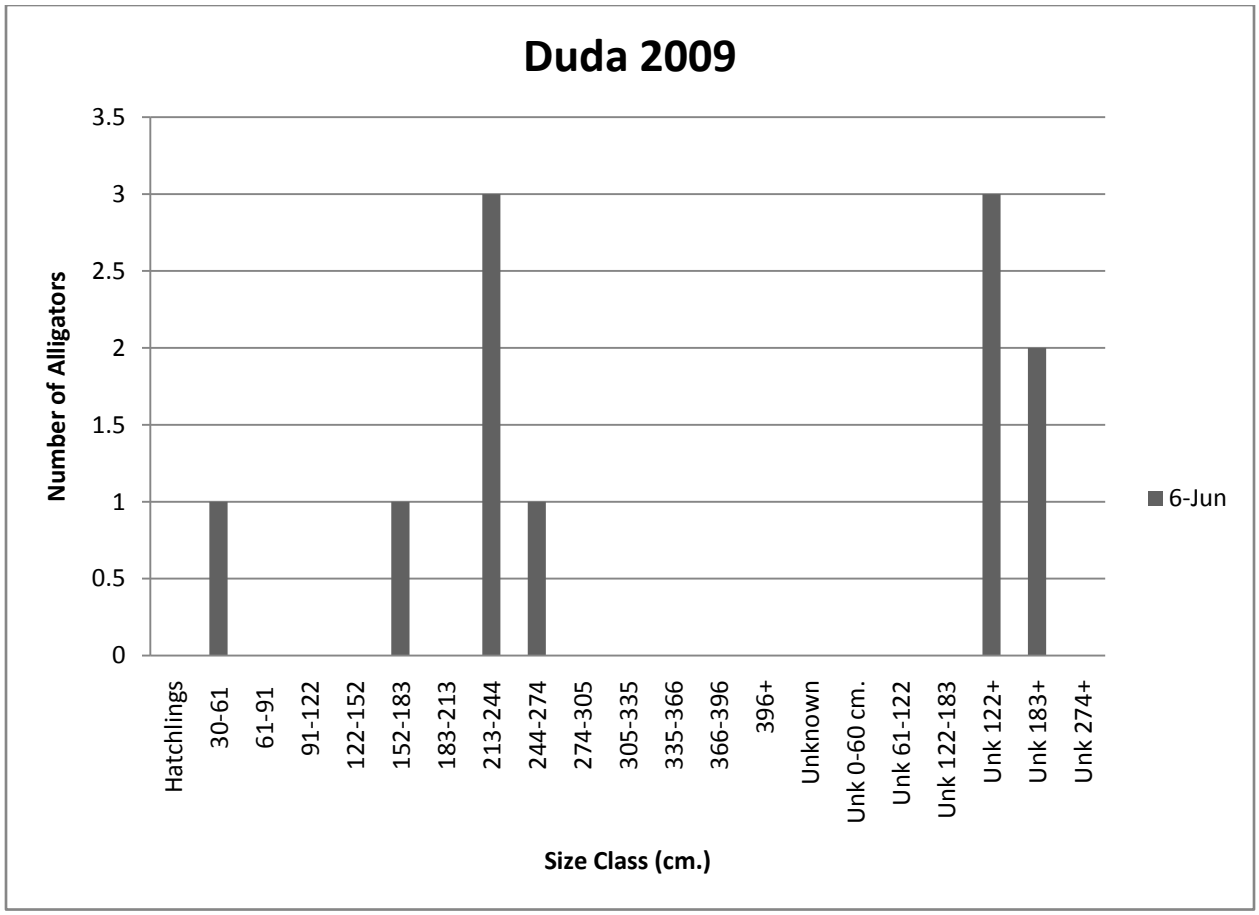
Appendix B-2: Nightlight survey graphs from 2007-2009.



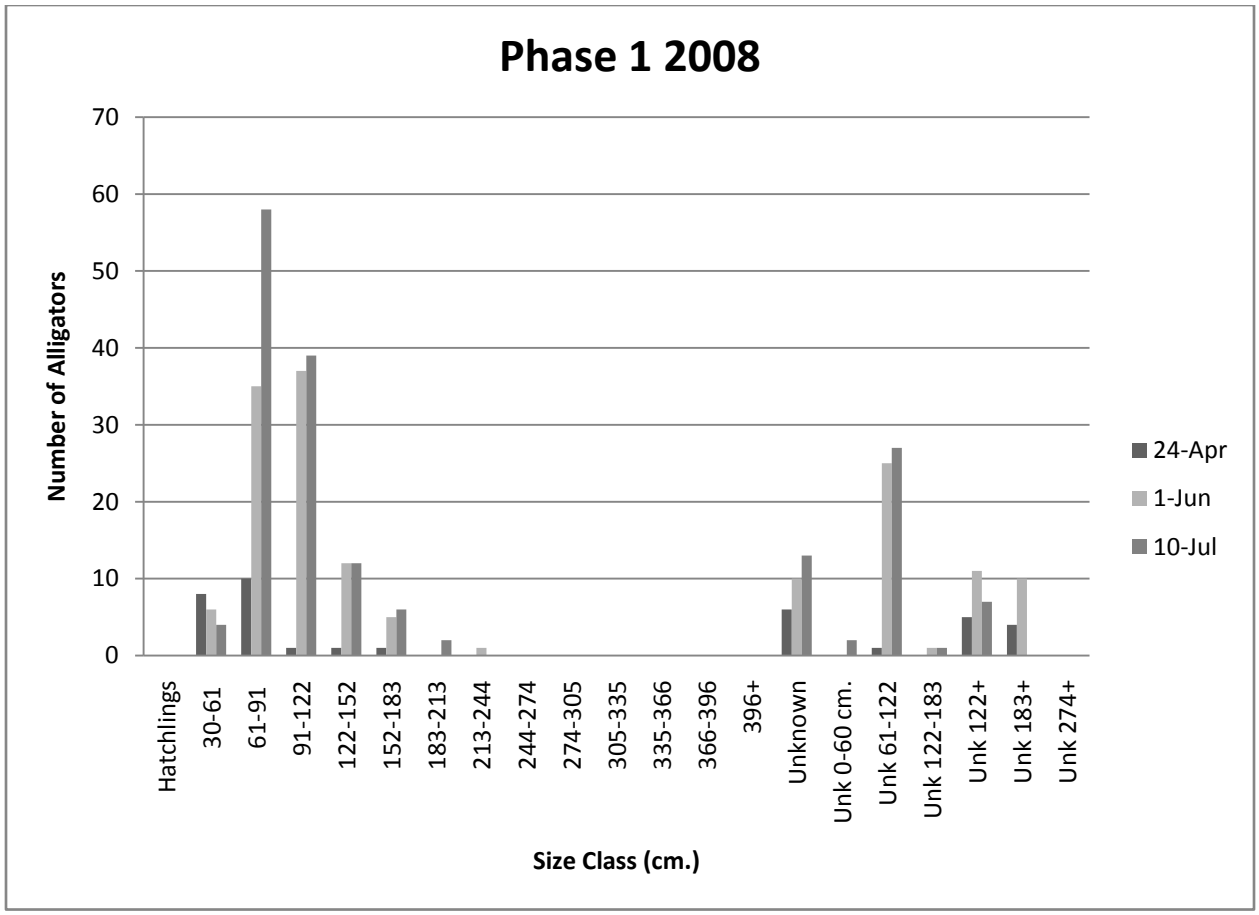
Appendix B-2a: Alligator size distributions for the Duda Unit in the NSRA in 2007.



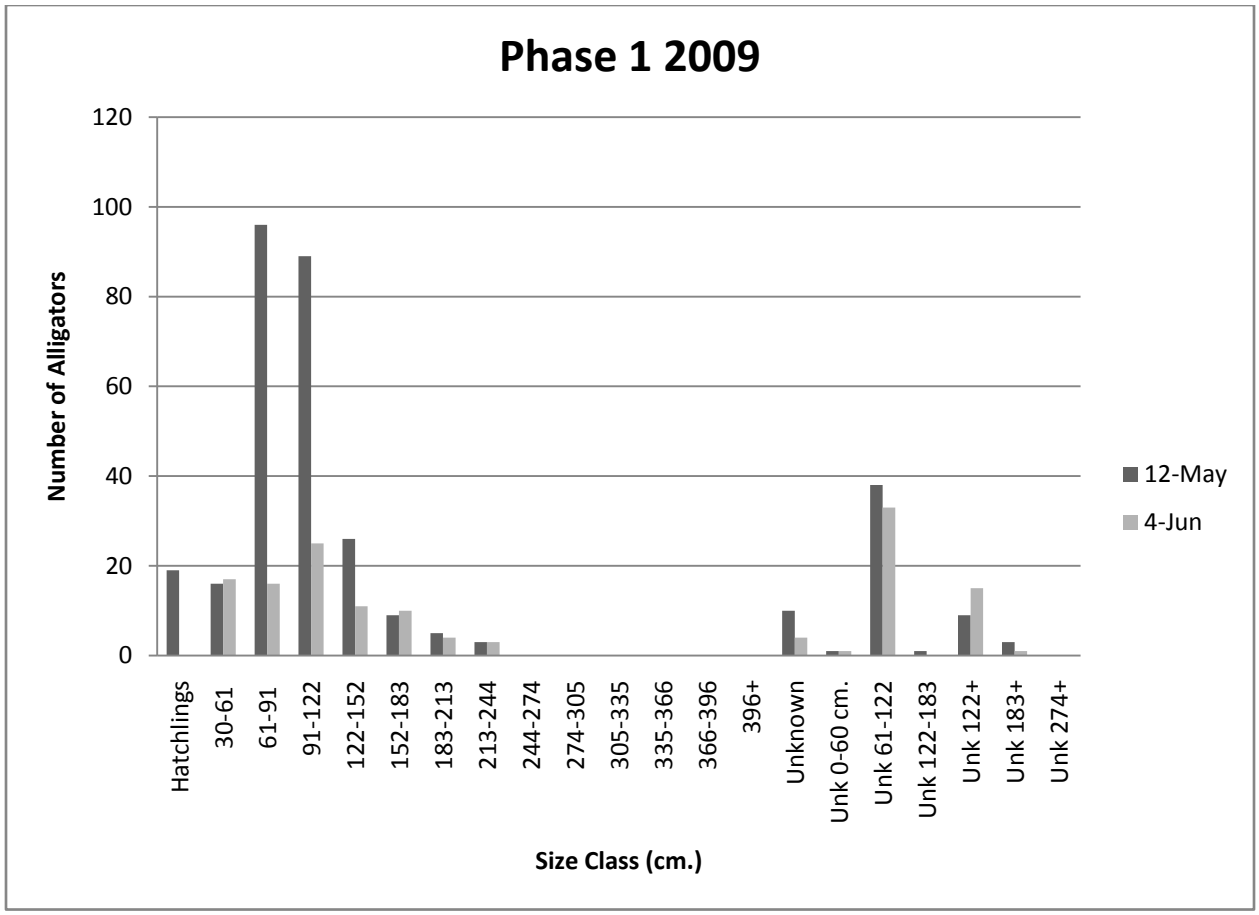
Appendix B-2b: Alligator size distributions for the Duda Unit in the NSRA for 2008.



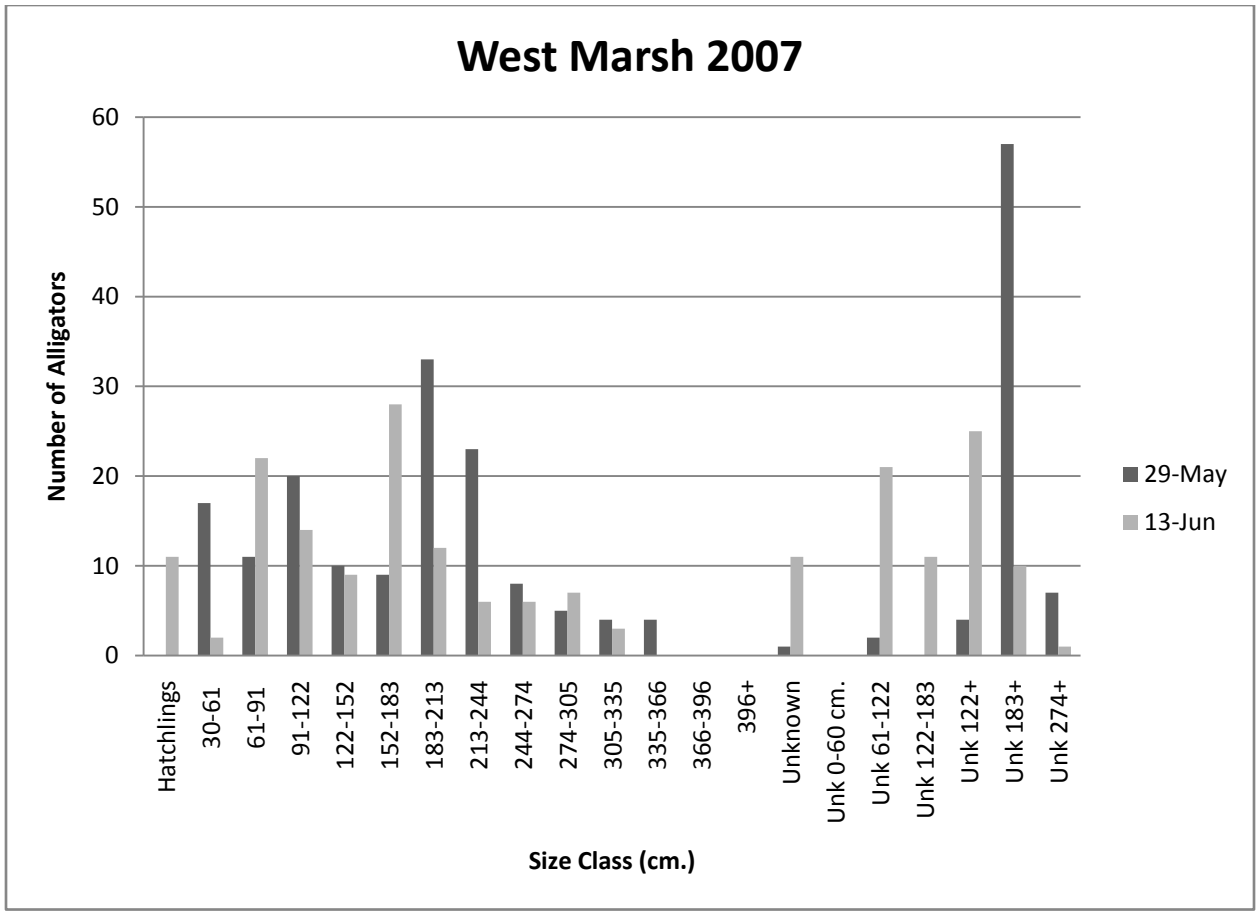
Appendix B-2c: Alligator size distributions for the Duda Unit in the NSRA for 2009.



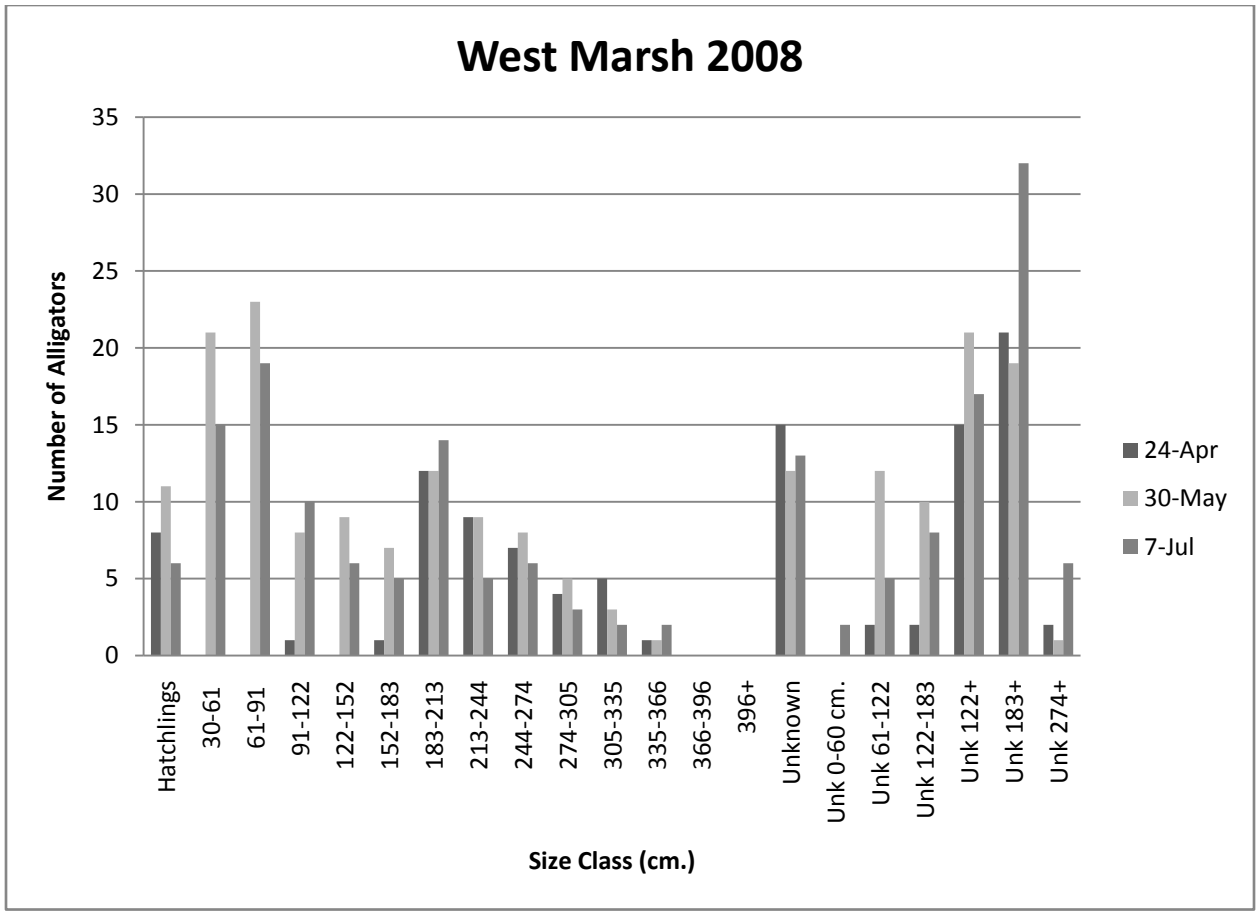
Appendix B-2d: Alligator size distributions for the Phase 1 in the NSRA for 2008.



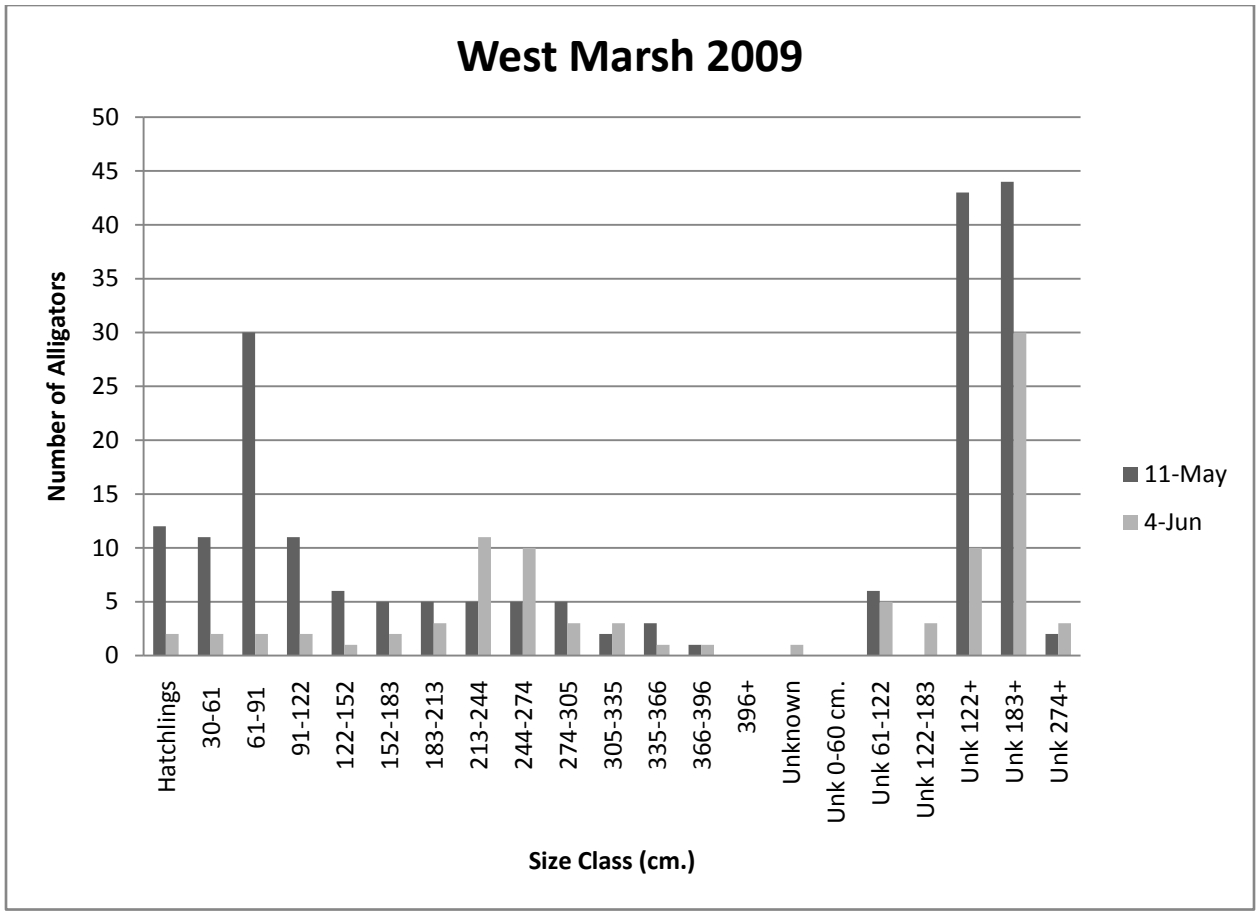
Appendix B-2e: Alligator size distributions for the Phase 1 in the NSRA for 2009.



Appendix B-2f: Alligator size distributions for the West Marsh in the NSRA for 2007.



Appendix B-2g: Alligator size distributions for the West Marsh in the NSRA for 2008.



Appendix B-2h: Alligator size distributions for the West Marsh in the NSRA for 2008.

APPENDIX C
ALLIGATOR CAPTURES DATA SET

Appendix C-1: Data collected on marked alligators in 2008 and 2009. Alligators were captured along the north shore of Lake Apopka, or in the NSRA impoundments.

Key

U2W Unit 2 West (Phase 1)

WM West Marsh

SVL Snout-vent length

Recap Recapture

unk unkown

Tag #	Unit	Date	Tot length (cm)	SVL (cm)	Weight (g)	Sex	Recap
FWC 31814	U2W	11/4/2009	125	57	4950	M	NO
FWC 32519	U2W	10/14/2008	136.5		7200		NO
FWC 32522	U2W	10/14/2008	131.6				NO
FWC 32721	U2W	11/6/2008	93.1	46.8	2280	M	NO
FWC 32730	U2W	11/6/2008	101.5	48.6	2500	M	NO
FWC 16109	U2W	11/4/2009					NO
FWC 16113	U2W	11/4/2009					NO

Tag #	Unit	Date	Tot length (cm)	SVL (cm)	Weight (g)	Sex	Recap
FWC 16117	U2W	11/4/2009					NO
FWC 16118	U2W	11/4/2009					NO
FWC 16120	U2W	11/4/2009					NO
FWC 16130	U2W	11/4/2009					NO
FWC 16131	U2W	11/4/2009					NO
FWC 16133	U2W	11/4/2009	30.7	14.6		unk	NO
FWC 16136	U2W	11/4/2009				unk	NO
FWC 16137	U2W	11/4/2009				unk	NO
FWC 16139	U2W	11/4/2009				unk	NO
FWC 16163	U2W	11/4/2009				unk	NO
FWC 16171	U2W	11/4/2009				unk	NO
FWC 16193	U2W	11/4/2009				unk	NO
FWC 32109	DUDA	10/1/2008	52	24.5		M	NO
FWC 32121	DUDA	10/1/2008	85.5	41.4		M	NO
FWC 32751	DUDA	11/4/2008	197	100	4700	F	NO

Tag #	Unit	Date	Tot length (cm)	SVL (cm)	Weight (g)	Sex	Recap
FWC 32794	DUDA	11/24/2008	80	37.9	1380	F	NO
FWC 32796	DUDA	11/24/2008	78.8	38.2	1400	M	NO
FWC 32788	DUDA	11/24/2008	94	45	2000	F	NO
FWC 32162	DUDA	3/31/2009	85.9	41.2	1500	M	NO
FWC 16101	DUDA	4/1/2009	31.5	15.2		unk	NO
FWC 16102	DUDA	4/1/2009	35.5	17.1		unk	NO
FWC 16103	DUDA	4/1/2009	31	14.7		unk	NO
FWC 16104	DUDA	4/1/2009	36	17.1		unk	NO
FWC 16105	DUDA	4/1/2009	36.6	18		unk	NO
FWC 16106	DUDA	4/1/2009	34.6	17		unk	NO
FWC 32137	DUDA	4/8/2009	65.3	31.4	675	M	NO
FWC 32175	DUDA	4/8/2009	73	35.5	870	F	NO
FWC 32140	DUDA	4/8/2009	76.2	37.8	940	M	NO
FWC 32111	DUDA	4/8/2009	77.5	38	1020	M	NO
FWC 32171	DUDA	4/8/2009	77.8	37	1080	F	NO

Tag #	Unit	Date	Tot length (cm)	SVL (cm)	Weight (g)	Sex	Recap
FWC 32116	DUDA	4/8/2009	94.7	47.2	2260	M	NO
FWC 32143	DUDA	4/8/2009	103.4	54.7	3550	M	NO
FWC 32002	DUDA	4/16/2009	61.1	29.2	520	M	NO
FWC 32004	DUDA	4/16/2009	70	34	800	M	NO
FWC 32005	DUDA	4/16/2009	69.5	33.5	820	M	NO
FWC 32003	DUDA	4/16/2009	90.5	44.1	1960	M	NO
FWC 32506	LAKE	10/1/2008	58.9	28.9	450	M	NO
FWC 32502	LAKE	10/1/2008	63.5	30.3	600	M	NO
FWC 32505	LAKE	10/1/2008	73.3	35	850	F	NO
FWC 32507	LAKE	10/1/2008	79.1	38.6	1150	M	NO
FWC 32510	LAKE	10/1/2008	80.5	40.1	1200	F	NO
FWC 32503	LAKE	10/1/2008	85.7	40.8	1500	M	NO
FWC 32509	LAKE	10/1/2008	86.7	43	1600	M	NO
FWC 32144	LAKE	3/17/2009	164.4	81.5		F	NO
FWC 32149	LAKE	3/18/2009	155.1	81		F	NO

Tag #	Unit	Date	Tot length (cm)	SVL (cm)	Weight (g)	Sex	Recap
FWC 32134	LAKE	4/8/2009	39.4	19.4	135		NO
FWC 32164	LAKE	4/8/2009	49.4	25.1	290		NO
FWC 32167	LAKE	4/8/2009	52.6	26.2	330		NO
FWC 31868	LAKE	4/8/2009	55.7	26.9	357		NO
FWC 32174	LAKE	4/8/2009	55.3	27.9	390		NO
FWC 32138	LAKE	4/8/2009	56.5	28.2	400		NO
FWC 32131	LAKE	4/8/2009	56.8	28.8	410		NO
FWC 32197	LAKE	4/8/2009	58.2	28.7	420		NO
FWC 32132	LAKE	4/8/2009	59.4	28.5	440		NO
FWC 31872	LAKE	4/8/2009	57.3	28.7	460		NO
FWC 32114	LAKE	4/8/2009	55.8	27.9	460		NO
FWC 32166	LAKE	4/8/2009	62.4	32.1	560		NO
FWC 32139	LAKE	4/8/2009	66.9	33.1	700	F	NO
FWC 31853	LAKE	4/8/2009	70.5	35.1	790	M	NO
FWC 32170	LAKE	4/8/2009	71.1	36.5	900	M	NO

Tag #	Unit	Date	Tot length (cm)	SVL (cm)	Weight (g)	Sex	Recap
FWC 32155	LAKE	4/8/2009	77.6	39.2	1040		NO
FWC 32112	LAKE	4/8/2009	78.2	40.4	1240	F	NO
FWC 32133	LAKE	4/8/2009	86.8	42.2	1480	M	NO
FWC 31861	LAKE	4/8/2009	93	46.6	2100	M	NO
FWC 32783	LAKE	4/9/2009	52.8	26	340	F	NO
FWC 32798	LAKE	4/9/2009	54.3	26.7	390	M	NO
FWC 31888	LAKE	4/9/2009	55.1	28.2	420		NO
FWC 31877	LAKE	4/9/2009	57.3	28.8	480	M	NO
FWC 31890	LAKE	4/9/2009	60	30.1	480	M	NO
FWC 31885	LAKE	4/9/2009	60	29.5	540	F	NO
FWC 31852	LAKE	4/9/2009	63.8	31.6	640	M	NO
FWC 31880	LAKE	4/9/2009	66.4	33.5	640	M	NO
FWC 31887	LAKE	4/9/2009	62.7	32.8	660	F	NO
FWC 32744	LAKE	4/9/2009	68.8	33.3	750	F	NO
FWC 32791	LAKE	4/9/2009	75.1	35.6	870	F	NO

Tag #	Unit	Date	Tot length (cm)	SVL (cm)	Weight (g)	Sex	Recap
FWC 31883	LAKE	4/9/2009	72.7	36.1	880	M	NO
FWC 32778	LAKE	4/9/2009	72.7	36.2	900	F	NO
FWC 32784	LAKE	4/9/2009	73.2	35.3	910	F	NO
FWC 32799	LAKE	4/9/2009	83	39.1	1100	F	NO
FWC 32743	LAKE	4/9/2009	78.1	37.8	1110	F	NO
FWC 31881	LAKE	4/9/2009	80.6	39.2	1120	M	NO
FWC 32748	LAKE	4/9/2009	81.4	39.5	1250	F	NO
FWC 31857	LAKE	4/9/2009	80.7	39.7	1340	F	NO
FWC 32746	LAKE	4/9/2009	90.9	44.7	2030	F	NO
FWC 32745	LAKE	4/9/2009	88.6	44.6	2250	F	NO
FWC 16107	LAKE	4/9/2009	35.4	18.6		unk	NO
FWC 16108	LAKE	4/9/2009	35.3	18.2		unk	NO
FWC 16124	LAKE	4/9/2009	36.9	19.6		unk	NO
FWC 31859	LAKE	4/15/2009	80.3	40.4	1260	M	NO
FWC 16187	LAKE	10/14/2009	32.7	15.7	80	unk	NO

Tag #	Unit	Date	Tot length (cm)	SVL (cm)	Weight (g)	Sex	Recap
FWC 16197	LAKE	10/14/2009	31.8	15.3	80	unk	NO
FWC 16188	LAKE	10/14/2009	32.4	15.6	90	unk	NO
FWC 16198	LAKE	10/14/2009	32.9	16.1	100	unk	NO
FWC 31865	LAKE	10/14/2009	64	30.2	690	M	NO
FWC 31858	LAKE	10/14/2009	67.7	32.4	740	M	NO
FWC 32565	PHASE II	10/21/2009	99.4	48.7	3080	M	NO
FWC 32563	PHASE II	10/21/2009	99.5	51.7	3360	F	NO
FWC 32559	PHASE II	10/21/2009	105.4	51.2	3500	M	NO
FWC 32561	PHASE II	10/21/2009	106.1	51	3770	F	NO
FWC 32566	PHASE II	10/21/2009	103.3	51.2	4130	M	NO
FWC 32560	PHASE II	10/21/2009	123.1	60.7	5840	M	NO
FWC 32567	PHASE II	10/21/2009	129.9	62.6	6970	F	NO
FWC 32568	PHASE II	10/21/2009	130.8	65	7260	M	NO
FWC 32562	PHASE II	10/21/2009	132.3	63.9	8100	F	NO
FWC 32564	PHASE II	10/21/2009	95.3	45.2		M	NO

Tag #	Unit	Date	Tot length (cm)	SVL (cm)	Weight (g)	Sex	Recap
FWC 31817	U2W	7/21/2008	77.6	39.3	1100	M	NO
FWC 32179	U2W	8/25/2008	151.8	75.2	11200	F	NO
FWC 32523	U2W	10/14/2008	76.5		350		NO
FWC 32511	U2W	10/14/2008	63.2		420		NO
FWC 32520	U2W	10/14/2008	87.9		1750		NO
FWC 32103	U2W	10/14/2008	89	46.8	2025	F	NO
FWC 32516	U2W	10/14/2008	99.6		2600		NO
FWC 32525	U2W	10/14/2008	103.9		2800		NO
FWC 32517	U2W	10/14/2008	102.8		2850		NO
FWC 32512	U2W	10/14/2008	103.5		3000		NO
FWC 32104	U2W	10/14/2008	107.9	53.4	3300	M	NO
FWC 32521	U2W	10/14/2008	106.7		3350		NO
FWC 32120	U2W	10/14/2008	112.9	55.5	3650	F	NO
FWC 32518	U2W	10/14/2008	108.5		3650		NO
FWC 32513	U2W	10/14/2008	107.6		4100		NO

Tag #	Unit	Date	Tot length (cm)	SVL (cm)	Weight (g)	Sex	Recap
FWC 32524	U2W	10/14/2008	121.9		4750		NO
FWC 32514	U2W	10/14/2008	118.5		4800		NO
FWC 32105	U2W	10/14/2008	124.9	63.3	5400		NO
FWC 32781	U2W	11/6/2008	60.5	30.4	650		NO
FWC 32719	U2W	11/6/2008	63.7	31.9	680	M	NO
FWC 32713	U2W	11/6/2008	70.6	34.2	1020	F	NO
FWC 32770	U2W	11/6/2008	73.8	35	1100		NO
FWC 32765	U2W	11/6/2008	75.6	36.9	1200		NO
FWC 32774	U2W	11/6/2008	79.5	39.2	1250		NO
FWC 32773	U2W	11/6/2008	84.1	41.2	1350		NO
FWC 32752	U2W	11/6/2008	82	39	1425		NO
FWC 32738	U2W	11/6/2008	84.6	40.8	1480	M	NO
FWC 32755	U2W	11/6/2008	84.8	41.5	1500		NO
FWC 32753	U2W	11/6/2008	87.2	43.9	1550		NO
FWC 32734	U2W	11/6/2008	83.1	40.8	1640	M	NO

Tag #	Unit	Date	Tot length (cm)	SVL (cm)	Weight (g)	Sex	Recap
FWC 32736	U2W	11/6/2008	84.6	41.4	1640	F	NO
FWC 32754	U2W	11/6/2008	84.9	42.2	1710		NO
FWC 32766	U2W	11/6/2008	89.8	45.1	1710		NO
FWC 32728	U2W	11/6/2008	88.7	43.3	1780	M	NO
FWC 32716	U2W	11/6/2008	89.9	43.9	1880	M	NO
FWC 32733	U2W	11/6/2008	89.9	44	1940	M	NO
FWC 32772	U2W	11/6/2008	90.6	43.2	2025		NO
FWC 32764	U2W	11/6/2008	92.4	46.8	2060		NO
FWC 32761	U2W	11/6/2008	94.8	48.2	2180		NO
FWC 32729	U2W	11/6/2008	94.6	45.7	2200	M	NO
FWC 32767	U2W	11/6/2008	98.9	48	2375		NO
FWC 32715	U2W	11/6/2008	95.6	47.6	2420	F	NO
FWC 32717	U2W	11/6/2008	92.5	46.4	2420	F	NO
FWC 32714	U2W	11/6/2008	96.2	47.4	2550	M	NO
FWC 32722	U2W	11/6/2008	99.1	48.2	2550	F	NO

Tag #	Unit	Date	Tot length (cm)	SVL (cm)	Weight (g)	Sex	Recap
FWC 32779	U2W	11/6/2008	97.8	46.8	2560		NO
FWC 32757	U2W	11/6/2008	99.5	51.1	2590		NO
FWC 32763	U2W	11/6/2008	101.2	51.5	2625		NO
FWC 32735	U2W	11/6/2008	103.1	50.2	2650	M	NO
FWC 32768	U2W	11/6/2008	101.9	49.5	2840		NO
FWC 32759	U2W	11/6/2008	102.5	51.4	2850		NO
FWC 32740	U2W	11/6/2008	105.4	50.9	2950	M	NO
FWC 32732	U2W	11/6/2008	105	53.5	3050	M	NO
FWC 32769	U2W	11/6/2008	100.4	48.1	3100		NO
FWC 32756	U2W	11/6/2008	104	52.8	3110		NO
FWC 32741	U2W	11/6/2008	104.1	50.5	3200	M	NO
FWC 32737	U2W	11/6/2008	109.4	52.9	3300	F	NO
FWC 32758	U2W	11/6/2008	104.1	53	3300		NO
FWC 32771	U2W	11/6/2008	108.4	51.8	3440		NO
FWC 32718	U2W	11/6/2008	108.6	53.5	3500	F	NO

Tag #	Unit	Date	Tot length (cm)	SVL (cm)	Weight (g)	Sex	Recap
FWC 32775	U2W	11/6/2008	106.5	51.1	3550		NO
FWC 32739	U2W	11/6/2008	113.1	55.5	3800	M	NO
FWC 32726	U2W	11/6/2008	95.6	55.1	3950	F	NO
FWC 32760	U2W	11/6/2008	114	58	4100		NO
FWC 32731	U2W	11/6/2008	118.8	56.9	4350	M	NO
FWC 32762	U2W	11/6/2008	118.6	60.6	4650		NO
FWC 32172	U2W	3/31/2009	64	32.5	680	F	NO
FWC 32148	U2W	3/31/2009	73.6	37.5	950	M	NO
FWC 32196	U2W	3/31/2009	72.1	35.2	1000	M	NO
FWC 32146	U2W	3/31/2009	83.3	40.5	1360	M	NO
FWC 32101	U2W	3/31/2009	80.7	39.5	1450	M	NO
FWC 32128	U2W	3/31/2009	86	42.7	1500	F	NO
FWC 32165	U2W	3/31/2009	83.9	42	1500	F	NO
FWC 32102	U2W	3/31/2009	91	45.4	1700	M	NO
FWC 32159	U2W	3/31/2009	91	45.7	1820	F	NO

Tag #	Unit	Date	Tot length (cm)	SVL (cm)	Weight (g)	Sex	Recap
FWC 32156	U2W	3/31/2009	148.5	77.9		F	NO
FWC 31846	U2W	10/21/2009	65.6	31.5	800	M	NO
FWC 31825	U2W	10/21/2009	69.2	33.8	900	M	NO
FWC 31807	U2W	10/21/2009	72.7	34.2	1110	M	NO
FWC 31826	U2W	10/21/2009	74.6	35.4	1120	F	NO
FWC 31802	U2W	10/21/2009	76.6	36.7	1280	M	NO
FWC 31876	U2W	10/21/2009	86.4	40.8	1760	M	NO
FWC 31882	U2W	10/21/2009	85.4	41.6	1790	M	NO
FWC 31801	U2W	10/21/2009	87	41.8	1820	M	NO
FWC 31854	U2W	10/21/2009	90.3	39.9	1960	M	NO
FWC 31867	U2W	10/21/2009	91.7	44.3	1990	M	NO
FWC 31873	U2W	10/21/2009	90.5	44.4	2100	M	NO
FWC 31848	U2W	10/21/2009	91.2	43.3	2130	M	NO
FWC 31830	U2W	10/21/2009	95	45.6	2140	M	NO
FWC 31895	U2W	10/21/2009	94.6	45.6	2240	F	NO

Tag #	Unit	Date	Tot length (cm)	SVL (cm)	Weight (g)	Sex	Recap
FWC 31824	U2W	10/21/2009	99.1	47.2	2750	M	NO
FWC 31845	U2W	10/21/2009	104.5	48.3	3160	F	NO
FWC 31805	U2W	10/21/2009	107.1	50.8	3240	M	NO
FWC 31834	U2W	10/21/2009	106.5	52.1	3350	F	NO
FWC 31810	U2W	10/21/2009	106.4	50.3	3490	F	NO
FWC 31829	U2W	10/21/2009	111.1	53.3	3530	M	NO
FWC 31841	U2W	10/21/2009	116	57.2	4880	F	NO
FWC 31864	U2W	10/21/2009	128.2	63.4	6400	F	NO
FWC 31804	U2W	10/21/2009	131.3	64.2	6900	M	NO
FWC 31815	U2W	10/21/2009	135.6	65.3	8180	M	NO
FWC 16135	U2W	11/4/2009	30.2	14	70	F	NO
FWC 31836	U2W	11/4/2009	62	28.8	560	F	NO
FWC 31820	U2W	11/4/2009	62	28.9	650	M	NO
FWC 31897	U2W	11/4/2009	64.8	29.5	710	M	NO
FWC 31812	U2W	11/4/2009	66.3	29.5	730	F	NO

Tag #	Unit	Date	Tot length (cm)	SVL (cm)	Weight (g)	Sex	Recap
FWC 31816	U2W	11/4/2009	66.6	32.2	770	M	NO
FWC 31844	U2W	11/4/2009	68.4	32.9	800	F	NO
FWC 31827	U2W	11/4/2009	72	31.6	840	M	NO
FWC 31821	U2W	11/4/2009	69.1	32.3	850	F	NO
FWC 32747	U2W	11/4/2009	68.4	32	860	F	NO
FWC 30464	U2W	11/4/2009	68.6	32.5	870	M	NO
FWC 31875	U2W	11/4/2009	71.1	33.1	890	M	NO
FWC 30468	U2W	11/4/2009	70.9	34.5	980	F	NO
FWC 32786	U2W	11/4/2009	77.7	36.9	1110	M	NO
FWC 32749	U2W	11/4/2009	78	37	1220	M	NO
FWC 31819	U2W	11/4/2009	88	42.5	1720	M	NO
FWC 30466	U2W	11/4/2009	89.7	42.5	1850	M	NO
FWC 30467	U2W	11/4/2009	87.8	42.6	1930	F	NO
FWC 32782	U2W	11/4/2009	92.6	44.3	1930	M	NO
FWC 31823	U2W	11/4/2009	93.6	44.2	2000	M	NO

Tag #	Unit	Date	Tot length (cm)	SVL (cm)	Weight (g)	Sex	Recap
FWC 30465	U2W	11/4/2009	95.6	46.5	2340	M	NO
FWC 32793	U2W	11/4/2009	97	47.5	2380	M	NO
FWC 32797	U2W	11/4/2009	103.3	49.2	2730	M	NO
FWC 32742	U2W	11/4/2009	103.9	49.2	2740	F	NO
FWC 31818	U2W	11/4/2009	107.5	52	3090	M	NO
FWC 32800	U2W	11/4/2009	108.3	52	3170	M	NO
FWC 30462	U2W	11/4/2009	106.2	51.1	3430	F	NO
FWC 30472	U2W	11/4/2009	110.1	54.6	3560	F	NO
FWC 32777	U2W	11/4/2009	108	53.8	3560	M	NO
FWC 30473	U2W	11/4/2009	115.4	55.8	3580	F	NO
FWC 32780	U2W	11/4/2009	109.5	52	3590	M	NO
FWC 30469	U2W	11/4/2009	116.2	66	4580	M	NO
FWC 30470	U2W	11/4/2009	119.8	59.7	4860	M	NO
FWC 31894	U2W	11/4/2009	137.3	64.5	7820	F	NO
FWC 30471	U2W	11/4/2009	137	68	7860	M	NO

Tag #	Unit	Date	Tot length (cm)	SVL (cm)	Weight (g)	Sex	Recap
FWC 31893	U2W	11/4/2009	138.5	68.4	7860	F	NO
FWC 32725	WM	11/4/2008	59.4	28.8	1350	M	NO
FWC 32710	WM	11/4/2008	73.4	34.2	2000	M	NO
FWC 32707	WM	11/4/2008	79.8	38.3	2120	M	NO
FWC 32701	WM	11/4/2008	72.3	34.4	2450	M	NO
FWC 32702	WM	11/4/2008	101.9	50.8	2500	F	NO
FWC 32706	WM	11/4/2008	98.6	48.4	2550	F	NO
FWC 32703	WM	11/4/2008	102.3	49.8	2925	F	NO
FWC 32708	WM	11/4/2008	104	51.7	2925	M	NO
FWC 32709	WM	11/4/2008	122.7	60.3	5500	F	NO
FWC 32724	WM	11/4/2008	148.1	72.4	9600	F	NO
FWC 32723	WM	11/4/2008	153	75.5	10200	F	NO
FWC 32711	WM	11/4/2008	163.8	79.5	12800	M	NO
FWC 32705	WM	11/4/2008	160.7	77.2	13600	F	NO
FWC 32704	WM	11/4/2008	178.5	85.5	17300	F	NO

Tag #	Unit	Date	Tot length (cm)	SVL (cm)	Weight (g)	Sex	Recap
FWC 32712	WM	11/4/2008	187.5	91.4	19400	F	NO
FWC 15854	WM	3/31/2009	30.5	14.2	68	unk	NO
FWC 15843	WM	3/31/2009	31.4	15.2	70	unk	NO
FWC 15858	WM	3/31/2009	30.5	15.1	70	unk	NO
FWC 15841	WM	3/31/2009	31	14.9	72	unk	NO
FWC 15868	WM	3/31/2009	31.2	15.4	72	unk	NO
FWC 15849	WM	3/31/2009	32.4	16	75	unk	NO
FWC 15839	WM	3/31/2009	31.6	15.4	76	unk	NO
FWC 15850	WM	3/31/2009	31.4	15	76	unk	NO
FWC 15844	WM	3/31/2009	31.3	15	77	unk	NO
FWC 15847	WM	3/31/2009	31.2	15.1	78	unk	NO
FWC 15857	WM	3/31/2009	32	15.5	80	unk	NO
FWC 15840	WM	3/31/2009	32.2	16	81	unk	NO
FWC 15848	WM	3/31/2009	32.1	15.6	81	unk	NO
FWC 15852	WM	3/31/2009	31.5	15.1	81	unk	NO

Tag #	Unit	Date	Tot length (cm)	SVL (cm)	Weight (g)	Sex	Recap
FWC 15860	WM	3/31/2009	33	16.1	81	unk	NO
FWC 15845	WM	3/31/2009	33	15.6	82	unk	NO
FWC 15863	WM	3/31/2009	31.2	15.6	83	unk	NO
FWC 15864	WM	3/31/2009	32.7	15.8	84	unk	NO
FWC 15866	WM	3/31/2009	33	16	84	unk	NO
FWC 15870	WM	3/31/2009	32.5	16	84	unk	NO
FWC 15853	WM	3/31/2009	33.4	15.9	85	unk	NO
FWC 15855	WM	3/31/2009	33	16.4	86	unk	NO
FWC 15856	WM	3/31/2009	34	16	87	unk	NO
FWC 15846	WM	3/31/2009	32.5	15.8	90	unk	NO
FWC 15861	WM	3/31/2009	34.2	16.8	91	unk	NO
FWC 15859	WM	3/31/2009	32.8	16.6	95	unk	NO
FWC 15869	WM	3/31/2009	34.8	16.7	95	unk	NO
FWC 15871	WM	3/31/2009	33.5	16.4	95	unk	NO
FWC 15851	WM	3/31/2009	33.6	16.5	96	unk	NO

Tag #	Unit	Date	Tot length (cm)	SVL (cm)	Weight (g)	Sex	Recap
FWC 15865	WM	3/31/2009	34.7	16.8	96	unk	NO
FWC 15842	WM	3/31/2009	33.6	16.1	100	unk	NO
FWC 15862	WM	3/31/2009	36.2	18	103	unk	NO
FWC 15867	WM	3/31/2009	35.5	17.4	105	unk	NO
FWC 32072	WM	3/31/2009	76.3	36	1000	F	NO
FWC 32068	WM	3/31/2009	79.7	38	1290	F	NO
FWC 32075	WM	3/31/2009	84.8	41.2	1420	F	NO
FWC 32070	WM	3/31/2009	87.2	42.2	1950	F	NO
FWC 32573	WM	10/21/2009	52.2	24.9	400	M	NO
FWC 32576	WM	10/21/2009	68.1	33.3	400	M	NO
FWC 32570	WM	10/21/2009	78.5	38.1	1420	M	NO
FWC 32569	WM	10/21/2009	91.6	44.5	1880	F	NO
FWC 32579	WM	10/21/2009	87.4	43.4	1880	M	NO
FWC 32572	WM	10/21/2009	90.9	43.5	1930	F	NO
FWC 32571	WM	10/21/2009	86.2	42.2	2010	M	NO

Tag #	Unit	Date	Tot length (cm)	SVL (cm)	Weight (g)	Sex	Recap
FWC 32580	WM	10/21/2009	87.5	43.4	2060	F	NO
FWC 32574	WM	10/21/2009	98	47.8	2770	M	NO
FWC 32575	WM	10/21/2009	122.7	61.3	5270	M	NO
FWC 32581	WM	10/21/2009	139.3	67.3	7710	M	NO

Appendix C-2: Data collected on recaptured alligators in 2008 and 2009. Alligators were captured along the north shore of Lake Apopka, or in the NSRA impoundments.

Tag #	Unit	Date	Tot length (cm)	SVL (cm)	Weight (g)	Sex	Recap?
FWC 32169	DUDA	11/20/2009	106.5	52.4	3280	F	YES
FWC 32787	PHASE II	11/12/2009	126.2	62.4	5720	M	YES
FWC 31851	PHASE II	11/12/2009	127.2	82.5	6270	F	YES
FWC 31863	PHASE II	11/12/2009	145.1	72.4	8150	M	YES
FWC 32163	PHASE II	11/12/2009	142.7	70.8	9260	M	YES
FWC 31810	U2W	11/4/2009	107.3	51	3520	F	YES
FWC 31201	U2W	11/19/2009	113.6	55.8	3910	M	YES
FWC 32182	U2W	11/19/2009	142.9	70.9	7660	M	YES
FWC 32189	U2W	11/20/2009	111.4	56	3880	M	YES
FWC 32071	WM	10/21/2009	107.5	54.3	3510		YES
FWC 32130	DUDA	4/8/2009	69.3	32.9	760	M	YES
FWC 32159	DUDA	4/8/2009	90.7	43.8	1930	F	YES
FWC 32775	DUDA	4/8/2009	113.1	57	4060	F	YES
FWC 32504	LAKE	10/1/2008	54.2	25.5	400	F	YES

Tag #	Unit	Date	Tot length (cm)	SVL (cm)	Weight (g)	Sex	Recap?
FWC 32501	LAKE	10/1/2008	55.7	26.5		M	YES
FWC 32108	LAKE	4/8/2009	62.4	31.3	680		YES
FWC 31855	LAKE	4/9/2009	55.7	28.6	440	M	YES
FWC 31871	LAKE	4/9/2009	57.2	28.8	460	F	YES
FWC 32510	LAKE	4/9/2009	79.7	40.1	1160	M	YES
FWC 32510	LAKE	4/15/2009	80.5	39.9	1240	M	YES
FWC 31883	LAKE	4/15/2009	73.5	33.2		M	YES
FWC 31886	LAKE	10/14/2009	49.9	23.4	280	M	YES
FWC 31869	LAKE	10/14/2009	48.2	22.3	290	M	YES
FWC 31874	LAKE	10/14/2009	54	25.6	370	M	YES
FWC 31878	LAKE	10/14/2009	53.8	25	370	F	YES
FWC 31862	LAKE	10/14/2009	54.9	26.3	380	M	YES
FWC 31866	LAKE	10/14/2009	48.6	25.7	400	M	YES
FWC 31879	LAKE	10/14/2009	54.5	25.3	410	M	YES
FWC 31856	LAKE	10/14/2009	55.8	25.8	420	M	YES

Tag #	Unit	Date	Tot length (cm)	SVL (cm)	Weight (g)	Sex	Recap?
FWC 31860	LAKE	10/14/2009	62	29.8	500	M	YES
FWC 32177	U2W	10/14/2008					YES
FWC 32182	U2W	10/14/2008					YES
FWC 32184	U2W	10/14/2008					YES
FWC 32189	U2W	10/14/2008					YES
FWC 32190	U2W	10/14/2008					YES
FWC 32193	U2W	10/14/2008					YES
FWC 32065	U2W	10/16/2008					YES
FWC 32176	U2W	10/16/2008					YES
FWC 32185	U2W	10/16/2008					YES
FWC 32187	U2W	10/16/2008					YES
FWC 32191	U2W	10/25/2008					YES
FWC 32720	U2W	11/6/2008	64.3	30.5	630	F	YES
FWC 32523	U2W	11/6/2008	77.7	38.1	1440	M	YES
FWC 32193	U2W	11/6/2008	105.6	51.7	2675		YES

Tag #	Unit	Date	Tot length (cm)	SVL (cm)	Weight (g)	Sex	Recap?
FWC 32065	U2W	11/6/2008					YES
FWC 32781	U2W	3/31/2009	62.1	33	640	F	YES
FWC 32118	U2W	3/31/2009	75.3	37	1020	M	YES
FWC 32187	U2W	3/31/2009					YES
FWC 32771	U2W	3/31/2009					YES
FWC 31833	U2W	10/21/2009	124.4	59.6	5620	M	YES
FWC 31808	U2W	10/21/2009	149.9	76.7	7100	M	YES
FWC 32022	U2W	11/4/2009	64.9	29.6	670	M	YES
FWC 32006	U2W	11/4/2009	89.4	42.5	1770	M	YES
FWC 31882	U2W	11/4/2009	86	41.7	1950	M	YES
FWC 31873	U2W	11/4/2009	91.8	44.3	2220	M	YES
FWC 32118	U2W	11/4/2009	96.2	45.6	2260	M	YES
FWC 31845	U2W	11/4/2009	106	49.8	3260	F	YES
FWC 32511	U2W	11/4/2009	108.3	52.4	3390	F	YES
FWC 32785	U2W	11/4/2009	110.3	54.4	3580	M	YES

Tag #	Unit	Date	Tot length (cm)	SVL (cm)	Weight (g)	Sex	Recap?
FWC 32583	U2W	11/4/2009	108	51.8	3620	F	YES
FWC 32021	U2W	11/4/2009	112.6	56	4140	M	YES
FWC 32734	U2W	11/4/2009	118.1	58	4850	M	YES
FWC 32790	U2W	11/4/2009	138	66	7570	M	YES
BRD 7645	WM	10/16/2008					YES
FWC 31211	WM	10/16/2008					YES
FWC 31217	WM	10/16/2008					YES
FWC 32056	WM	10/16/2008					YES
FWC 32057	WM	10/16/2008					YES
FWC 32058	WM	10/16/2008					YES
FWC 32060	WM	10/16/2008					YES
FWC 32061	WM	10/16/2008					YES
FWC 32063	WM	10/16/2008					YES
FWC 32064	WM	10/16/2008					YES
FWC 32054	WM	10/25/2008					YES

Tag #	Unit	Date	Tot length (cm)	SVL (cm)	Weight (g)	Sex	Recap?
FWC 32055	WM	10/25/2008					YES
FWC 31220	WM	11/24/2008	104.5	51	2700	F	YES
FWC 32060	WM	11/24/2008	99.5	48.7			YES
FWC 32063	WM	11/24/2008	109.4	53.4			YES
FWC 32062	WM	3/31/2009				F	YES
FWC 32577	WM	10/21/2009	63.2	30	390	F	YES
FWC 32578	WM	10/21/2009	59.4	29.2	640	M	YES
FWC 32789	WM	10/21/2009	84.5	40.1	1680	M	YES
FWC 32592	WM	10/21/2009	103.7	50.7	2860	M	YES
FWC 32707	WM	10/21/2009	104.7	50.3	3260	M	YES
FWC 32071	WM	10/21/2009	107.5	54.3	3510	F	YES
FWC 32072	WM	10/21/2009	76.9	45.1		F	YES
FWC 32595	WM	10/21/2009	184	86		M	YES

APPENDIX D
MOVEMENT PROBABILITY MODEL EQUATIONS AND WEIGHTS

Appendix D-1: Movement probability models for yearly and weekly model sets with associated adjusted weights.

Model Set	Model	Equation	Adjusted Weight
Yearly Move Out	1	p = 1-(1/(1+EXP(4.0341+(2.6913*LA)-(19.0204*P1)-(1.4953*WM)-(0.0564*TL)+(2.0055*SexM))	0.58
	2	p = 1-(1/(1+EXP(-1.8032+2.2233*LA-19.0433*P1-1.3060*WM+1.8788*SexM)	0.42
Yearly Move In	1	p = 1-(1/(1+EXP(-2.7139-0.0242*LA-0.4498*P1-19.1819*WM+2.2420*SexM)	0.47
	2	p = 1-(1/(1+EXP(2.0136+0.2018*LA-0.3604*P1-19.1758*WM-0.0439*TL+2.0129*SexM)	0.33
	3	p = 1-(1/(1+EXP(4.8341-0.2743*LA-0.3996*P1-18.5975*WM-0.0573*TL)	0.12
	4	p = 1-(1/(1+EXP(-1.0986-0.5108*LA-0.3830*P1-18.4675*WM)	0.07
Weekly Move Out	1	p = 1-(1/(1+EXP(-2.4378+0.9680*LA-2.7951*P1-1.1046*WM+0.1004*HTEMP-0.0337*TL)	0.39
	2	p = 1-(1/(1+EXP(-6.0388+0.9023*LA-3.00911*P1-1.0359*WM+0.1013*HTEMP)	0.28
	3	p = 1-(1/(1+EXP(-7.5383+0.7908*LA-2.8611*P1-1.3605*WM+0.1003*HTEMP+0.0829*WLEV-0.0339*TL)	0.16
	4	p = 1-(1/(1+EXP(-11.0091+(0.7304*LA)-(3.0737*P1)-(1.2839*WM)+(0.1012*HTEMP)+(0.0805*WLEV))	0.11
	5	p = 1-(1/(1+EXP(-11.5701+(0.7556*LA)-(3.0840*P1)-(1.2524*WM)+(0.1029*HTEMP)+(0.0859*WLEV)+(0.3293*SexM))	0.05
Weekly Move In	1	p = 1-(1/(1+EXP(-33.5246-(0.8822*LA)-(0.9590*P1)-(2.1894*WM)+(0.1019*HTEMP)+(0.4979*WLEV)-(0.0401*TL))	0.45
	2	p = 1-(1/(1+EXP(-37.0825-(0.9124*LA)-(1.1223*P1)-(2.0380*WM)+(0.1026*HTEMP)+(0.4854*WLEV))	0.23
	3	p = 1-(1/(1+EXP(-3.1062+(0.0758*LA)-(0.6519*P1)-(0.8003*WM)+(0.1136*HTEMP)-(0.0394*TL))	0.14
	4	p = 1-(1/(1+EXP(-37.5950-(0.8918*LA)-(1.1408*P1)-(1.9930*WM)+(0.1042*HTEMP)+(0.4902*WLEV)+(0.3283*SexM))	0.10
	5	p = 1-(1/(1+EXP(-7.3542+(0.0303*LA)-(0.8102*P1)-(0.6743*WM)+(0.1141*HTEMP))	0.08

APPENDIX E
HOME RANGE DATA AND INDIVIDUAL HOME RANGE MAPS

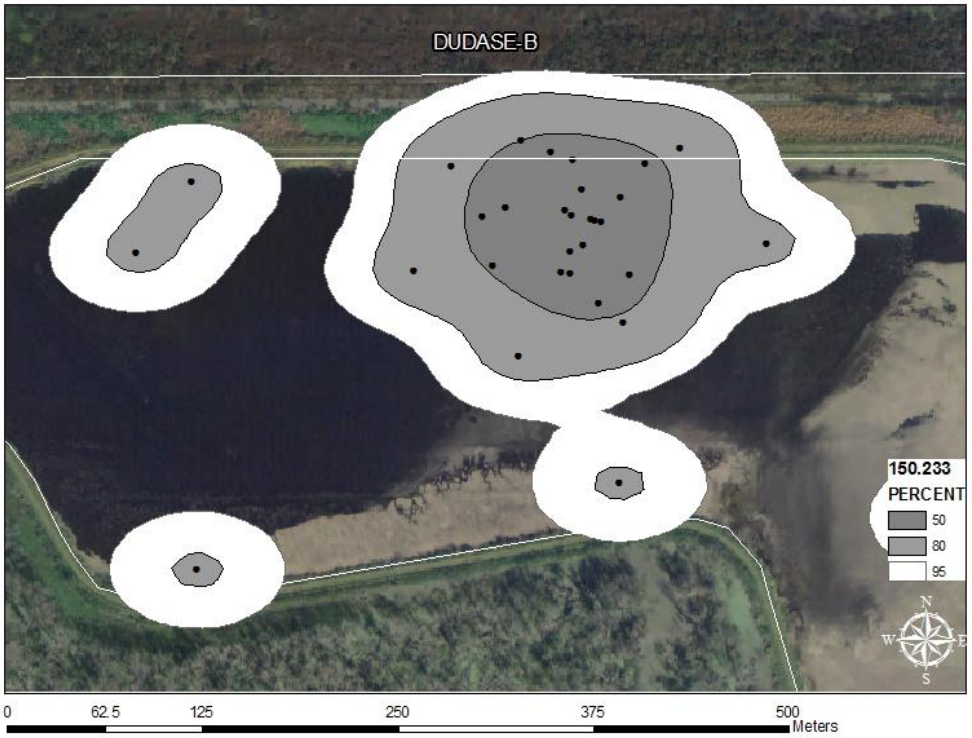
Appendix E-0: Table of individual movements and home range sizes of juvenile alligators in the NSRA**.**

							KDE Home Range (ha.)			
Radio	**FWC Tag#**	**Start Unit**	**End Unit**	**Sex**	**TL**	**Moved**	**HR50**	**HR80**	**HR95**	**MCP (ha.)**
150.021	32182	U2	U2	M	122.9	No	14.1	35.9	64.5	44.5
150.042	32059	WM	WM	F	97.7	No	16.7	41.4	75.0	43.7
150.053	32181	U2	U2	F	132.8	No	1.4	3.4	5.7	4.1
150.062	32189	U2	U2	M	94.7	No	3.8	10.4	20.4	30.1
150.083	32185	U2	U2	M	116.7	No	15.8	38.8	73.7	33.4
150.104	32054	WM	WM	F	90.4	No	2.2	7.0	12.6	17.2
150.112	32073	WM	WM	F	96.6	No	31.1	76.7	146.4	70.0
150.133	31217	WM	O	M	92.4	Yes	22.2	61.1	111.3	239.3
150.142	32178	U2	U2	M	110.2	No	4.4	14.1	24.7	61.1
150.152	32186	U2	U2	F	123.6	No	37.8	85.8	154.6	88.7
150.164	32053	WM	WM	F	95.1	No	1.5	3.5	5.7	6.7
150.174	31216	LA	DU	M	116.1	Yes	1.1	3.0	5.8	62.4
150.205	31222	WM	WM	M	112.1	No	4.0	9.8	16.9	32.1
150.215	31215	WM	WM	F	105.9	No	49.3	107.8	185.3	66.8
150.233	31220	DU	DU	F	104.7	No	1.3	3.9	8.2	10.6
150.246	31209	U2	U2	M	106.9	No	9.8	33.4	61.7	64.1
150.254	31210	U2	U2	M	102	No	11.2	28.7	48.8	25.0
150.264	31218	U2	U2	F	127.9	No	6.8	17.9	31.6	38.5
150.272	31212	WM	WM	M	114.4	No	6.8	15.9	26.9	10.4
150.283	31208	DU	U2	M	96.9	Yes	38.9	90.6	148.0	118.6
150.295	31205	LA	DU	M	88.6	Yes	3.4	8.1	14.0	8.7
150.303	31223	LA	DU	M	97.5	Yes	1.2	2.8	4.6	5.7
150.311	31213	DU	DU	F	101.3	No	1.0	2.1	4.0	3.3
150.335	31201	WM	WM	M	102.8	No	22.6	66.5	123.5	1063.0
150.343	32190	U2	U2	F	125.3	No	4.1	10.3	20.4	17.2
150.355	32052	WM	WM	M	98.8	No	1.3	4.0	8.3	81.0
150.383	32051	WM	WM	F	94	No	5.3	13.7	25.2	63.9
150.395	32180	U2	U2	F	142.3	No	19.7	50.5	87.0	68.5
150.405	32184	U2	U2	M	102.4	No	11.7	28.4	50.5	31.5
150.413	32056	WM	WM	M	110.5	No	1.2	3.4	6.5	4.2
150.425	32188	U2	U2	M	105	No	7.4	19.3	34.9	72.5
150.435	32173	LA	O	M	94.8	Yes	14.5	36.7	63.6	137.2
150.485	32025	DU	DU	F	109.5	No	10.2	27.5	46.9	31.6
150.495	32136	LA	U2	F	122.6	Yes	9.7	23.0	39.3	21.5
150.505	31851	LA	P1	F	108.6	Yes	40.6	94.7	170.7	128.2
150.513	32125	DU	O	M	121.1	Yes	10.0	27.3	49.9	556.4
150.534	31863	LA	P1	M	135	Yes	27.5	80.4	158.2	507.4

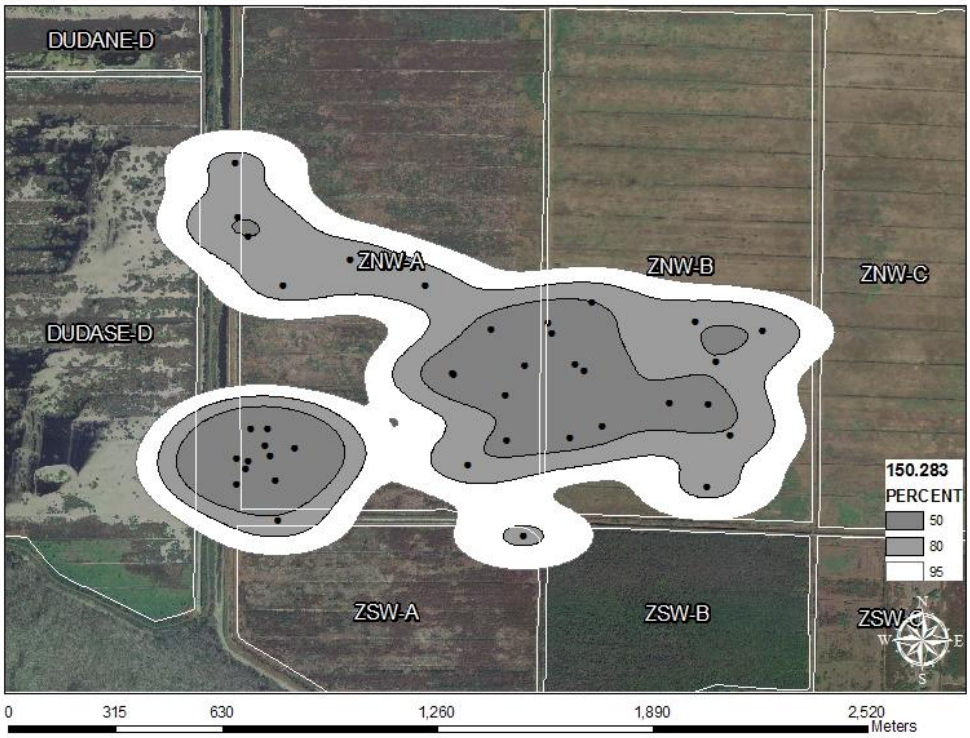
Radio	FWC Tag#	Start Unit	End Unit	Sex	TL	Moved	HR50	HR80	HR95	MCP (ha.)
150.544	32158	LA	U2	M	99.3	Yes	9.3	24.0	42.0	39.5
150.554	32061	WM	WM	M	120	No	6.0	16.5	34.0	31.0
150.564	32064	WM	O	M	92	Yes	11.0	31.5	60.3	534.6
150.573	32163	LA	P1	F	119.9	Yes	15.7	40.0	70.6	145.1
150.582	32071	WM	WM	F	97.1	No	51.4	113.7	197.8	67.1
150.604	32110	LA	LA	F	113	No	1.2	2.9	5.0	5.5
150.615	31822	U2	U2	M	114.5	No	3.2	11.0	22.0	29.8
150.665	31892	DU	DU	F	130.5	No	5.5	17.2	31.8	46.1
150.684	32183	U2	U2	F	97.5	No	20.4	46.8	79.4	47.2
150.694	32063	WM	WM	F	106.5	No	17.3	44.3	87.8	76.3
150.705	32024	DU	DU	F	94.3	No	1.2	3.1	5.8	21.3
150.713	32126	DU	LA	M	92	Yes	6.0	15.7	28.3	12.2
150.745	32169	DU	DU	M	99.5	No	3.2	9.8	19.1	24.4
150.764	32150	DU	DU	M	96.5	No	8.4	25.8	52.6	228.7
150.785	32199	LA	O	F	100.5	Yes	23.3	66.2	111.6	65.3
150.806	32145	DU	DU	M	108.7	No	5.3	14.8	27.8	58.6

Appendicies E 1-53: Individual home range maps

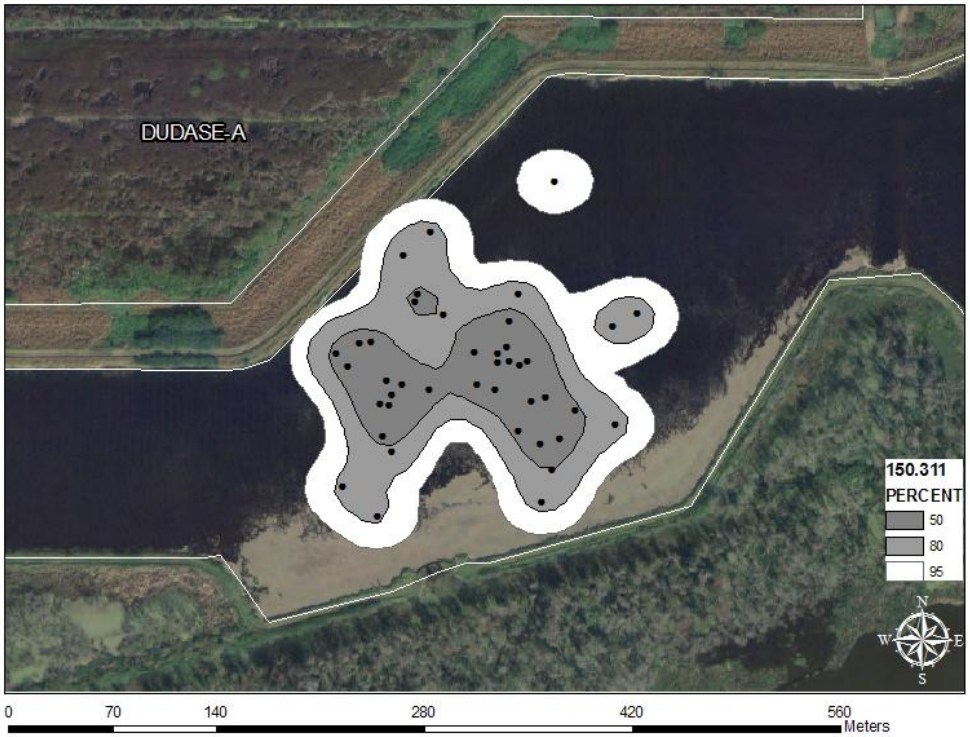
Appendix E-1. Home range of FWC 31220 originally from Duda. Radio 150.233, Female, TL=104.7 cm.



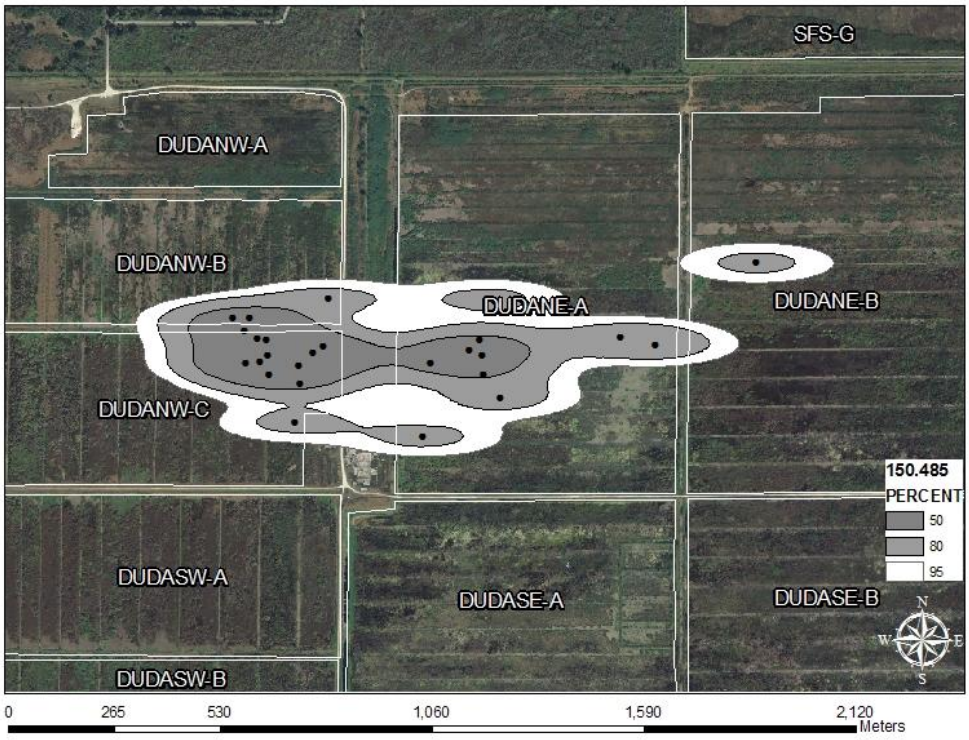
Appendix E-2. Home range of FWC 31208 originally from Duda. Radio 150.283, Male, TL=96.9 cm.



Appendix E-3. Home range of FWC 31213 originally from Duda. Radio 150.311, Female, TL=101.3 cm.

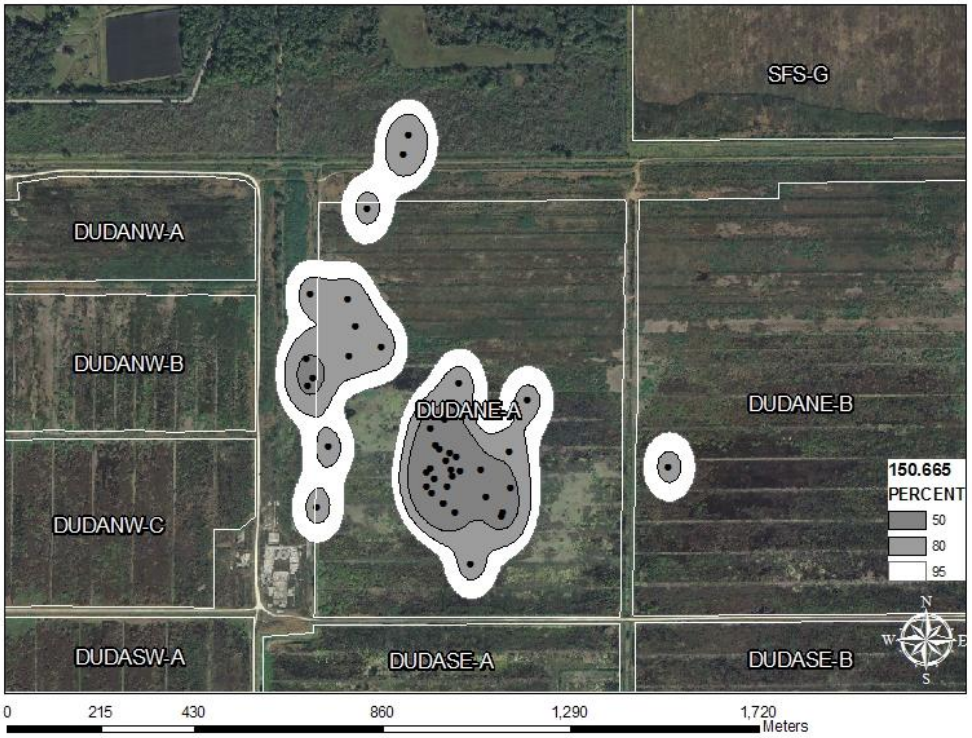


Appendix E-4. Home range of FWC 32025 originally from Duda. Radio 150.485, Female, TL=109.5 cm.

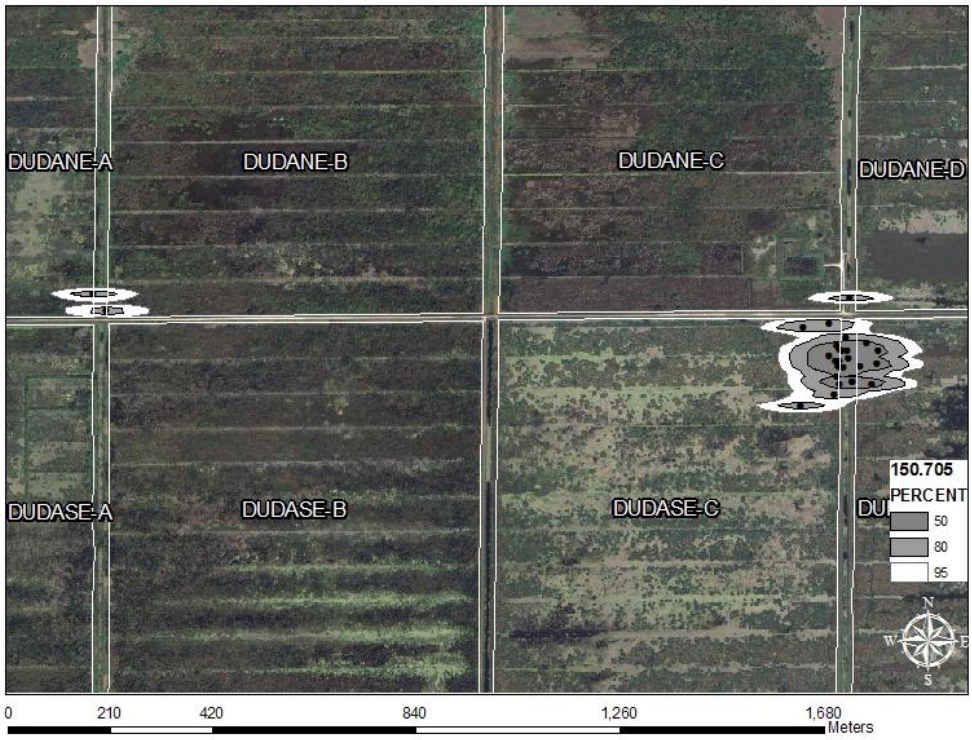


Appendix E-5. Home range of FWC 32125 originally from Duda. Radio 150.513, Male, TL=121.1 cm.

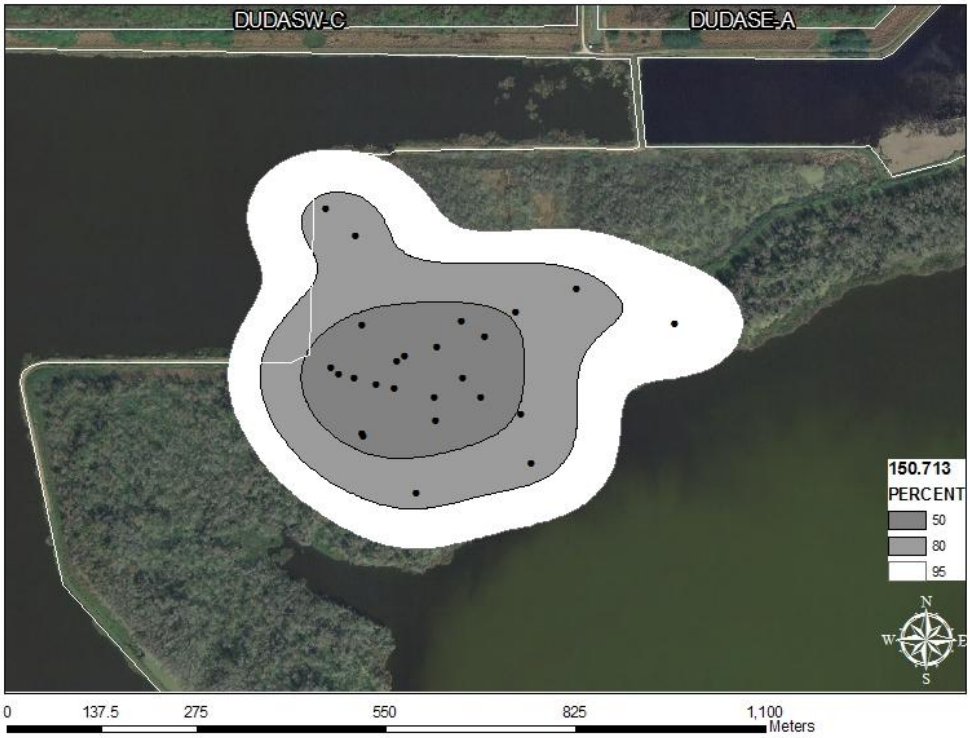
Appendix E-6. Home range of FWC 31892 originally from Duda. Radio 150.665, Female, TL=130.5 cm.



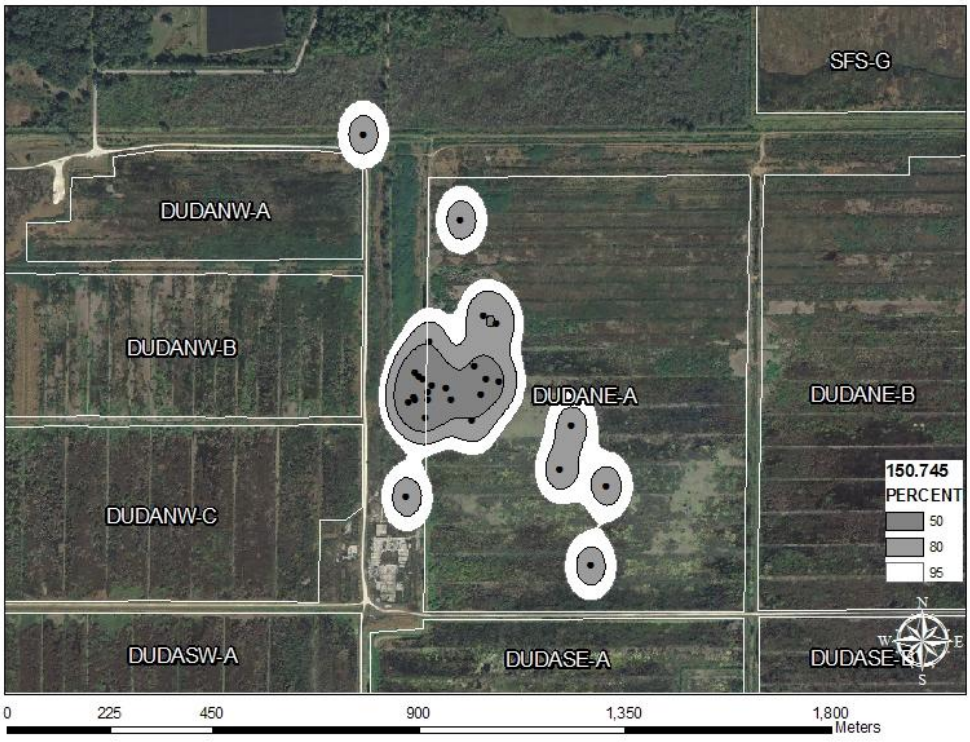
Appendix E-7. Home range of FWC 32024 originally from Duda. Radio 150.705, Female, TL=94.3 cm.



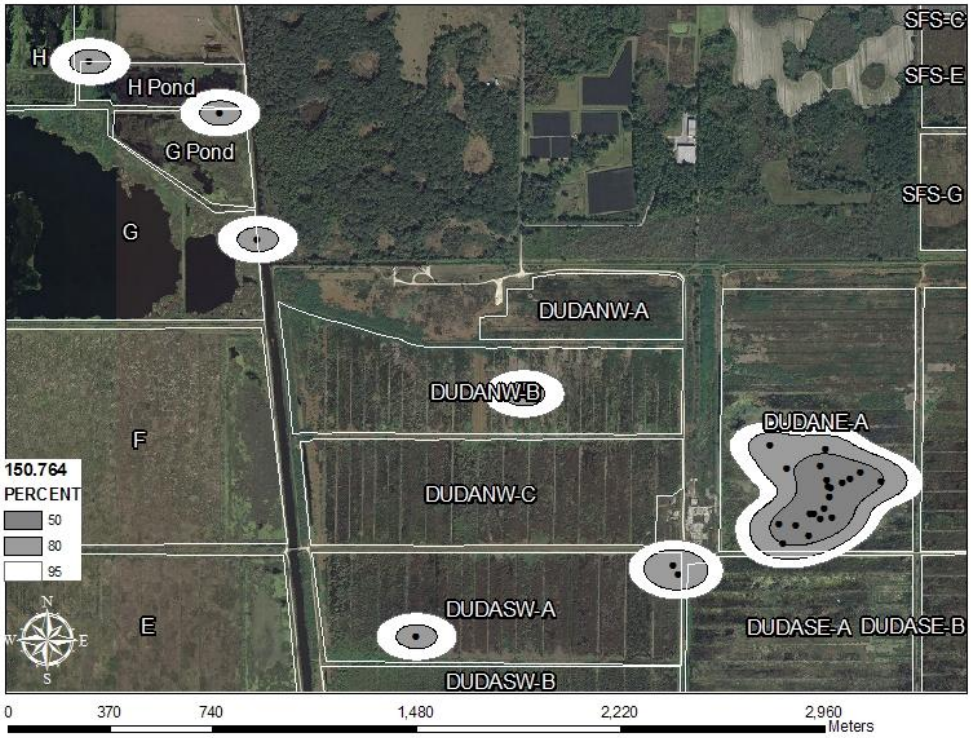
Appendix E-8. Home range of FWC 32126 originally from Duda. Radio 150.713, Male, TL=92.0 cm.



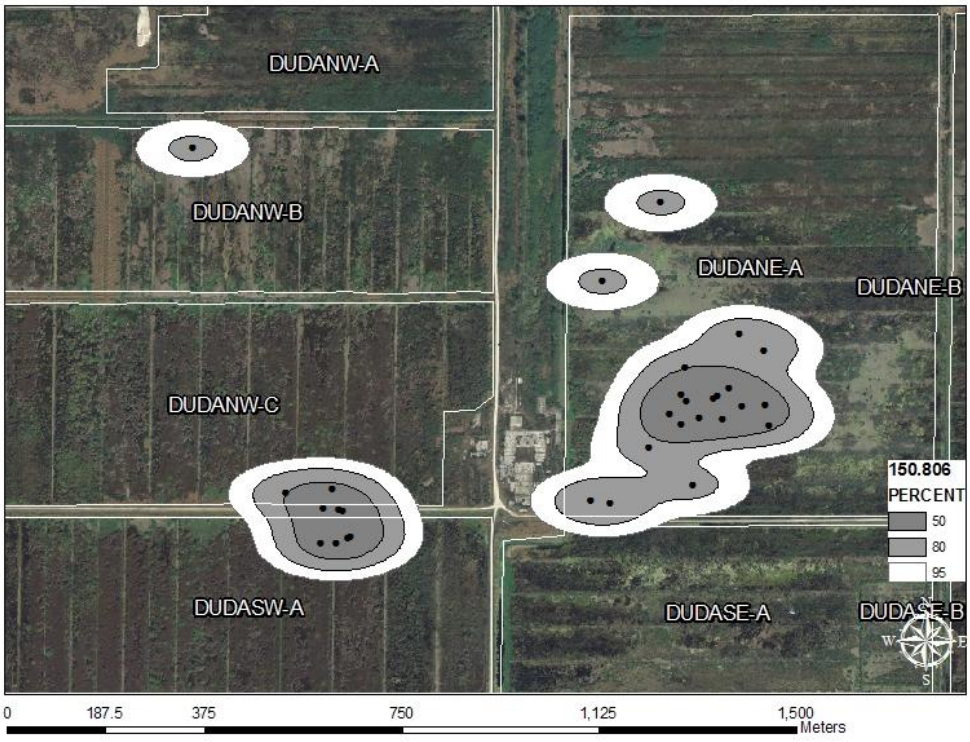
Appendix E-9. Home range of FWC 32169 originally from Duda. Radio 150.745, Male, TL=99.5 cm.



Appendix E-10. Home range of FWC 32150 originally from Duda. Radio 150.764, Male, TL=96.5 cm.

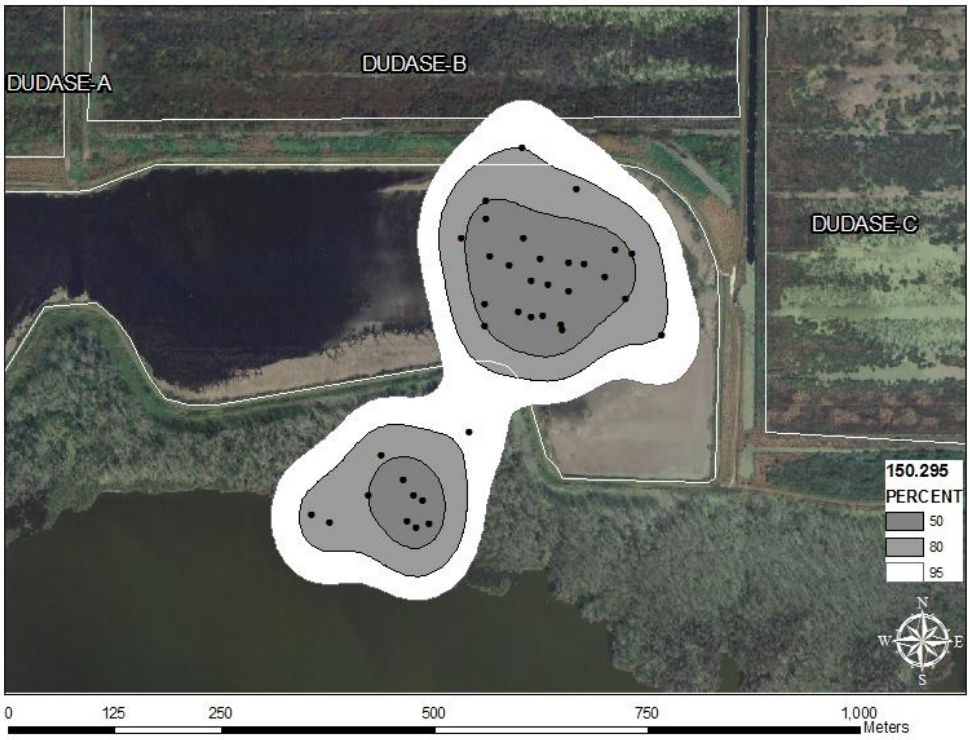


Appendix E-11. Home range of FWC 32145 originally from Duda. Radio 150.806, Male, TL=108.7 cm.

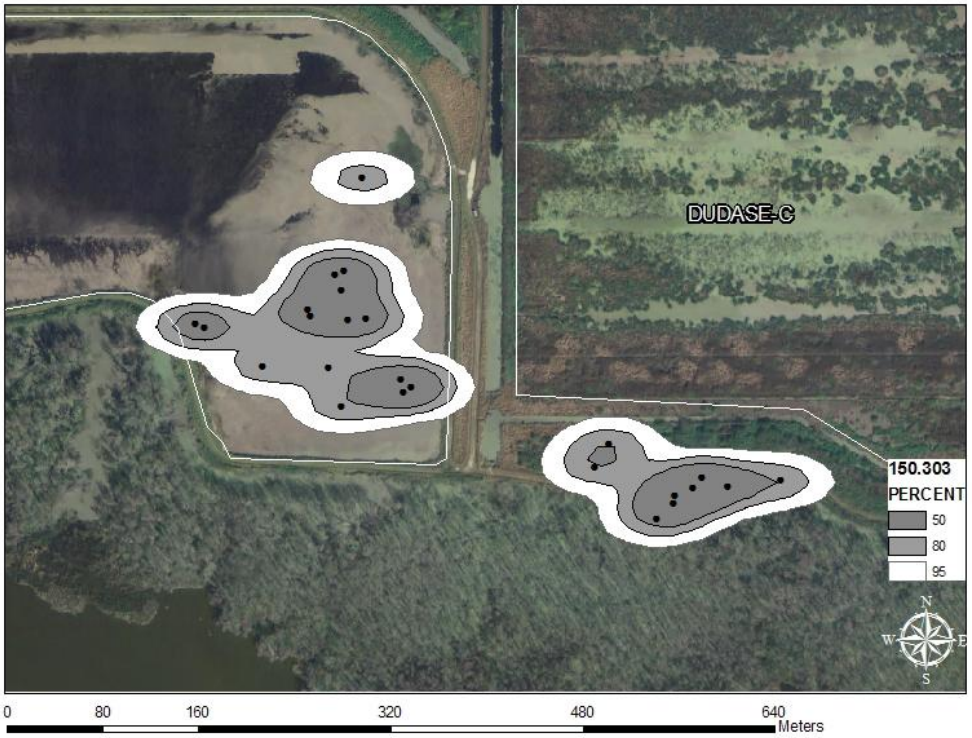


Appendix E-12. Home range of FWC 31216 originally from Lake Apopka. Radio 150.174, Male, TL=116.1 cm.

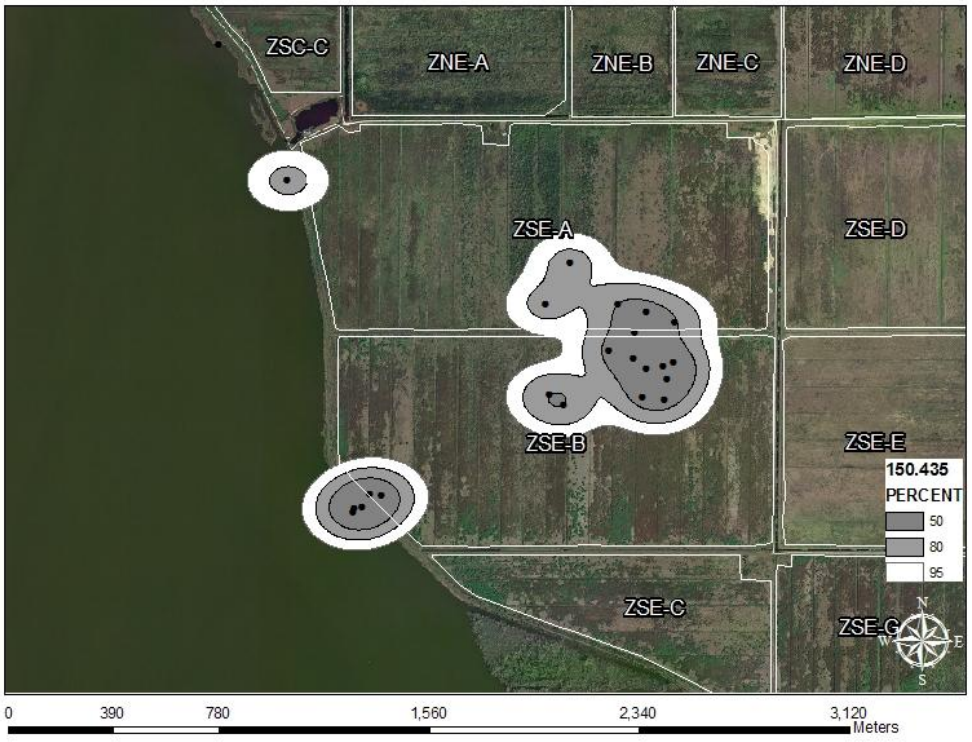
Appendix E-13. Home range of FWC 31205 originally from Lake Apopka. Radio 150.295, Male, TL=88.6 cm.



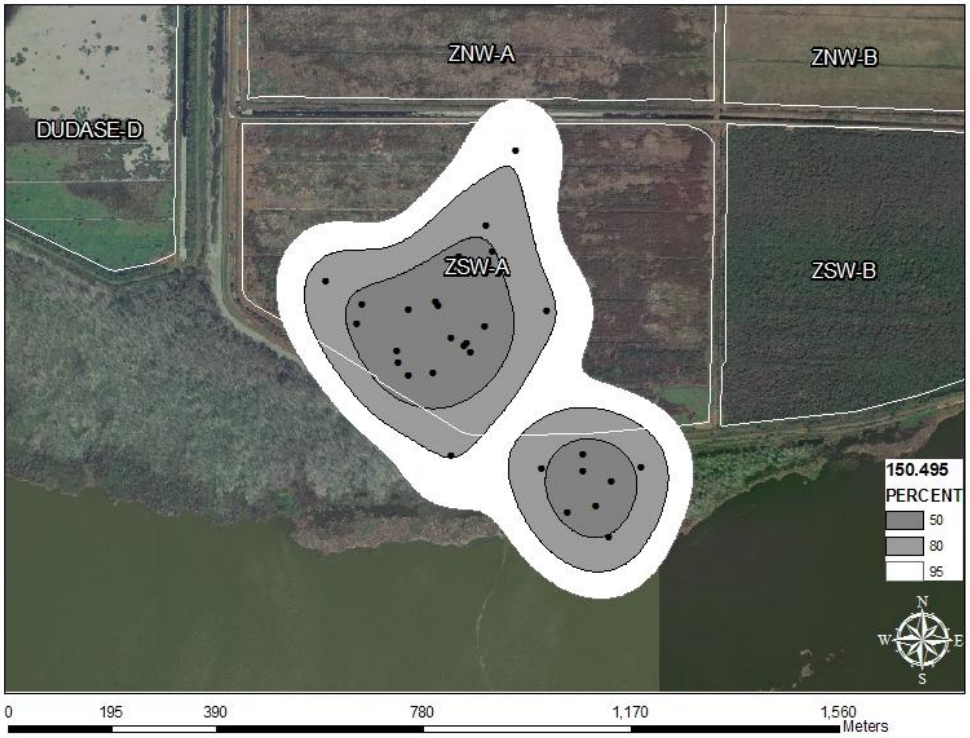
Appendix E-14. Home range of FWC 31223 originally from Lake Apopka. Radio 150.303, Male, TL=97.5 cm.



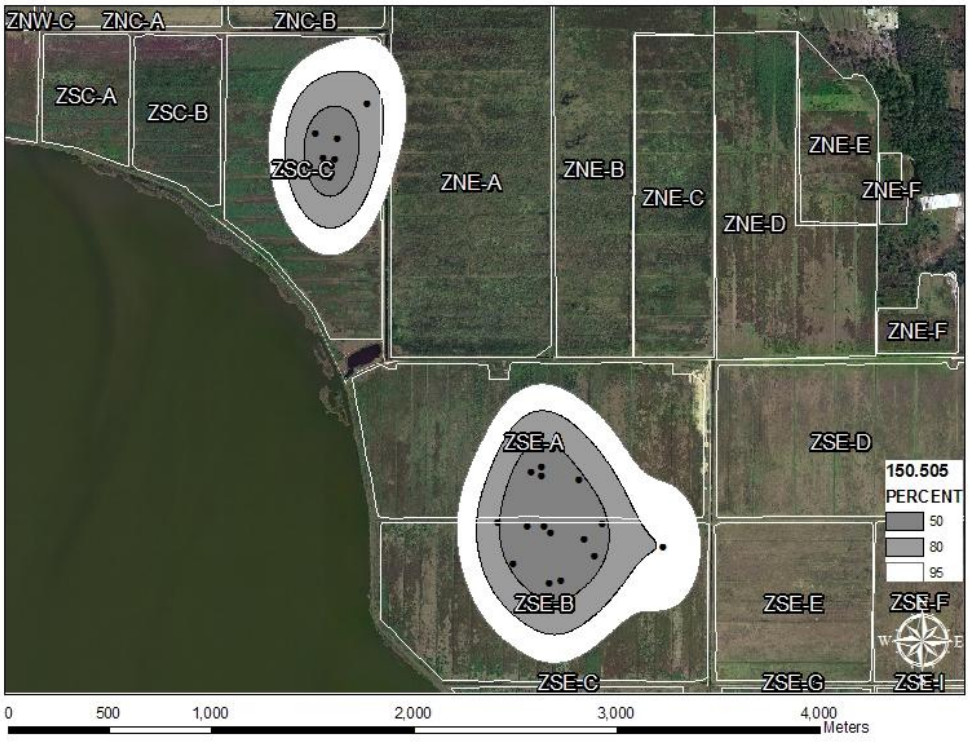
Appendix E-15. Home range of FWC 32173 originally from Lake Apopka. Radio 150.435, Male, TL=94.8 cm.



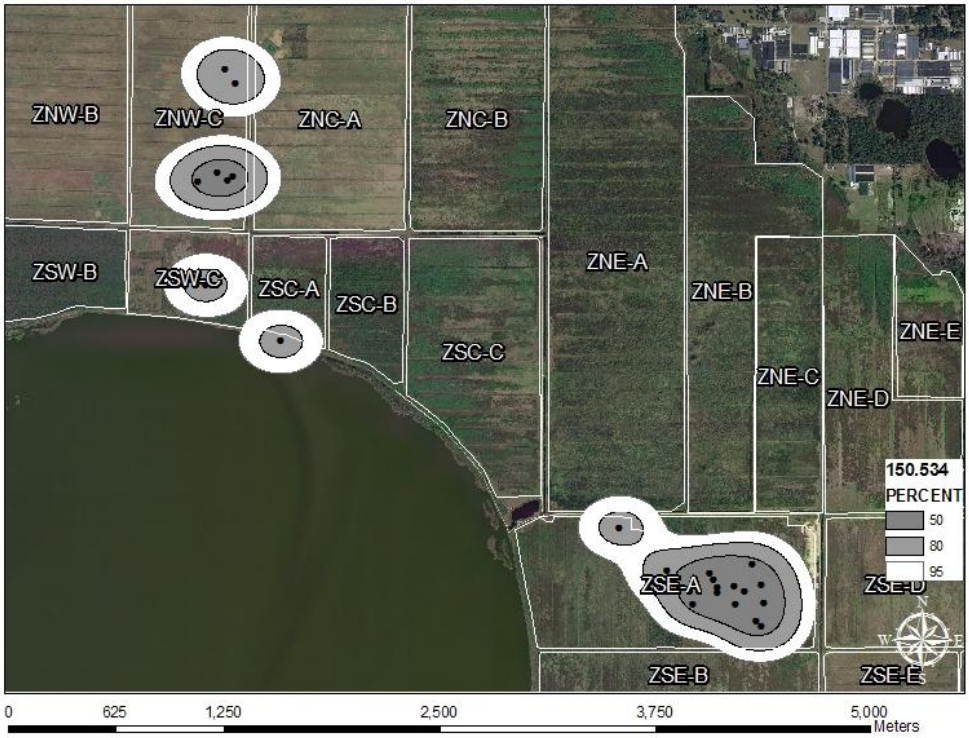
Appendix E-16. Home range of FWC 32136 originally from Lake Apopka. Radio 150.495, Female, TL=122.6 cm.



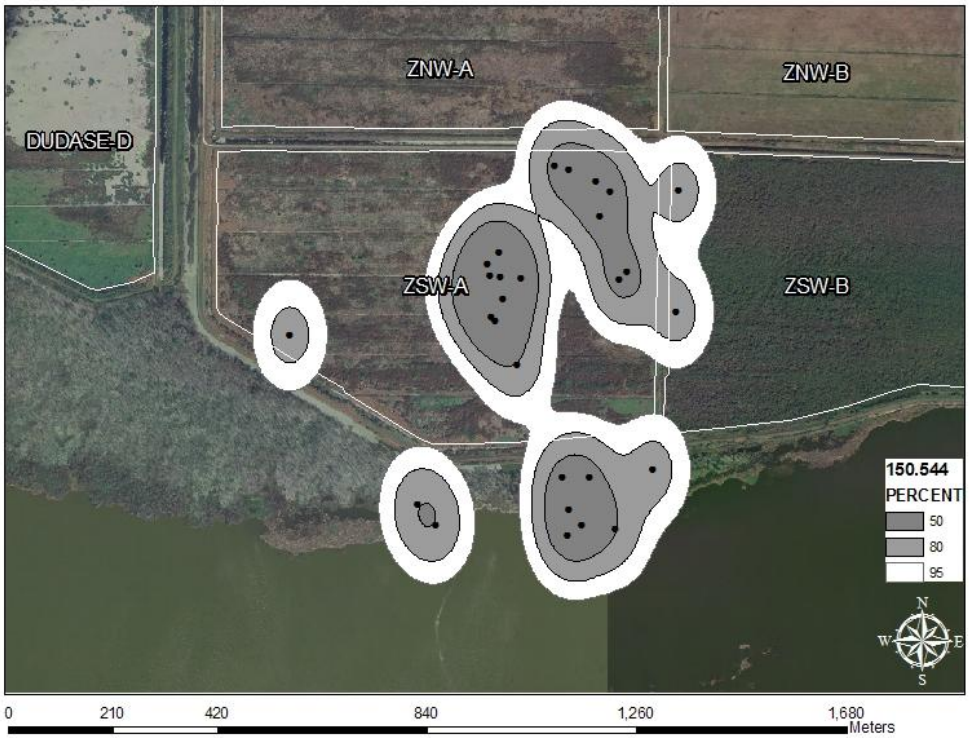
Appendix E-17. Home range of FWC 31851 originally from Lake Apopka. Radio 150.505, Female, TL=108.6 cm.



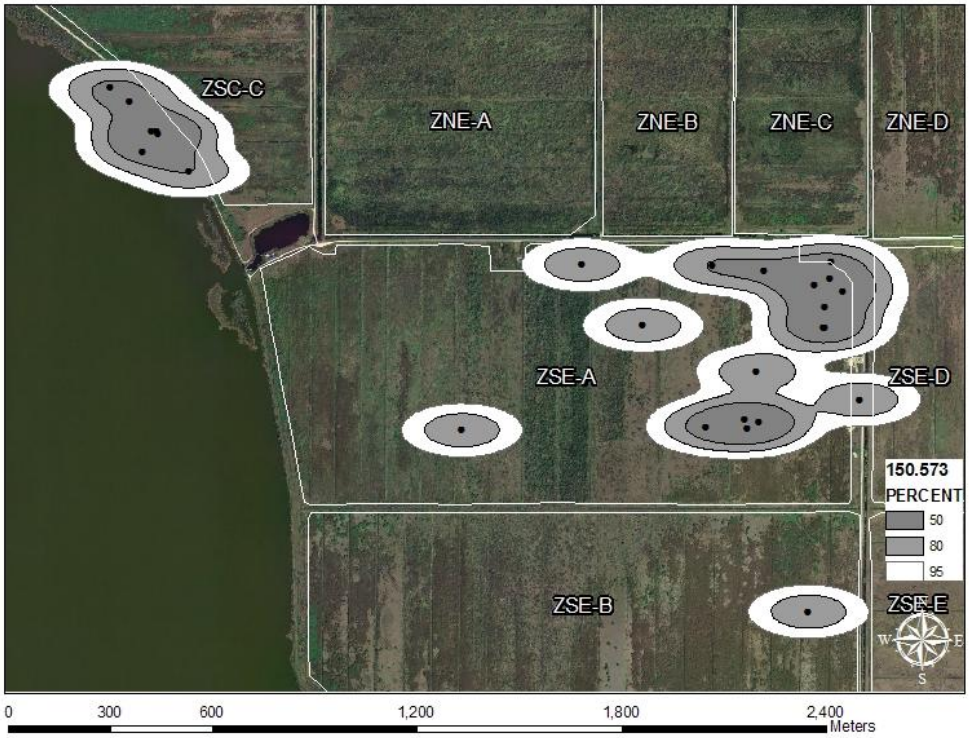
Appendix E-18. Home range of FWC 31863 originally from Lake Apopka. Radio 150.534, Male, TL=135.0 cm.



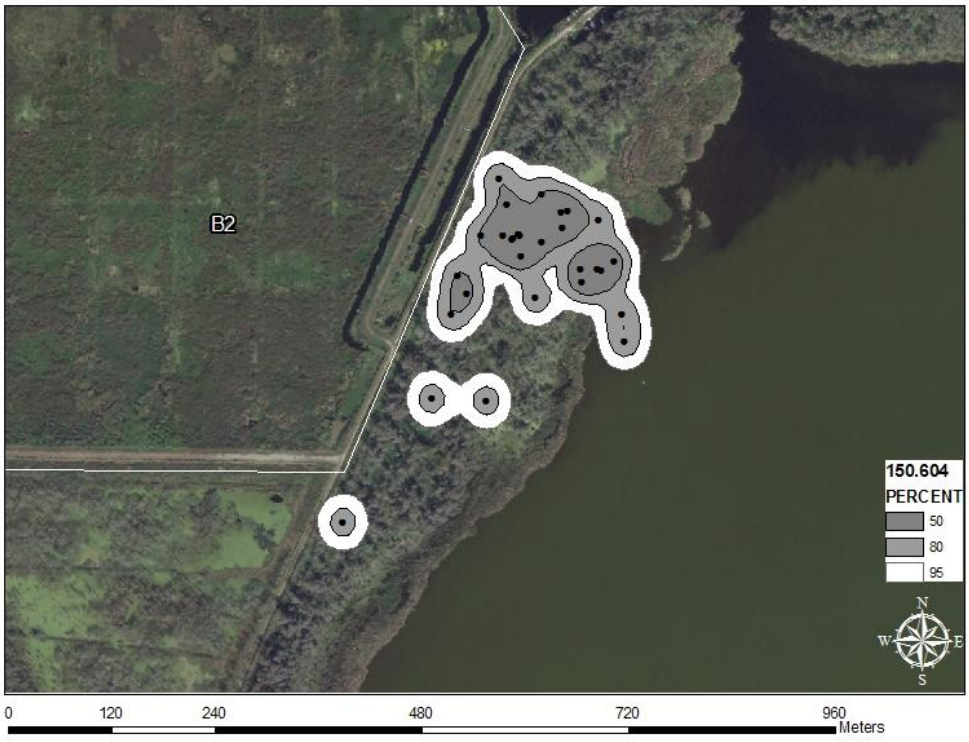
Appendix E-19. Home range of FWC 32158 originally from Lake Apopka. Radio 150.544, Male, TL=99.3 cm.



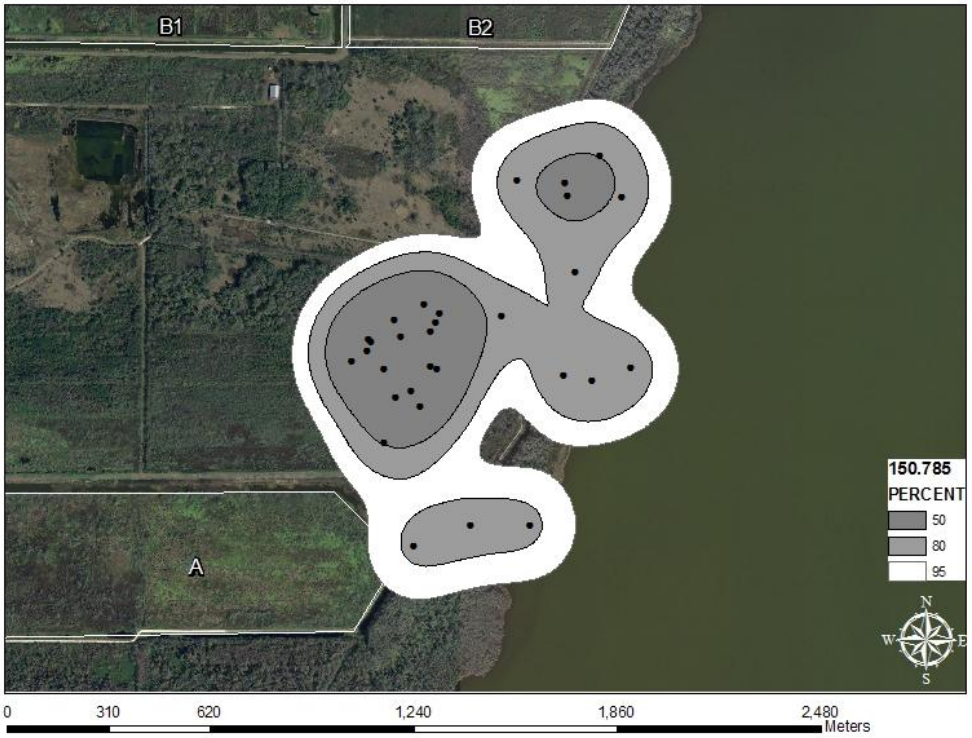
Appendix E-20. Home range of FWC 32163 originally from Lake Apopka. Radio 150.573, Female, TL=119.9 cm.



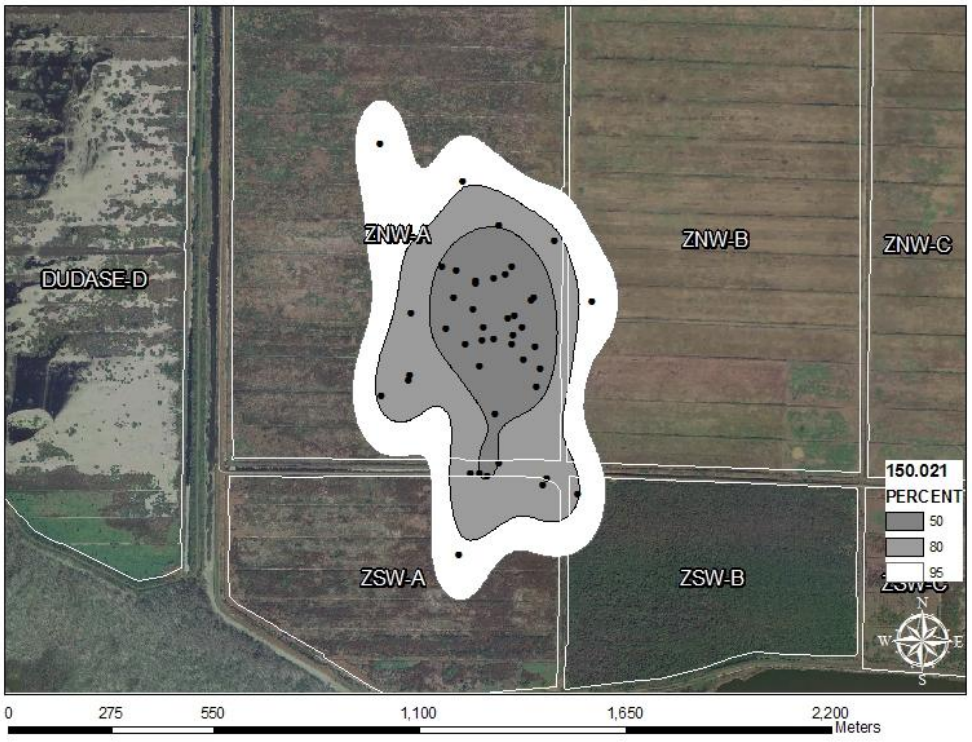
Appendix E-21. Home range of FWC 32110 originally from Lake Apopka. Radio 150.604, Female, TL=113.0 cm.



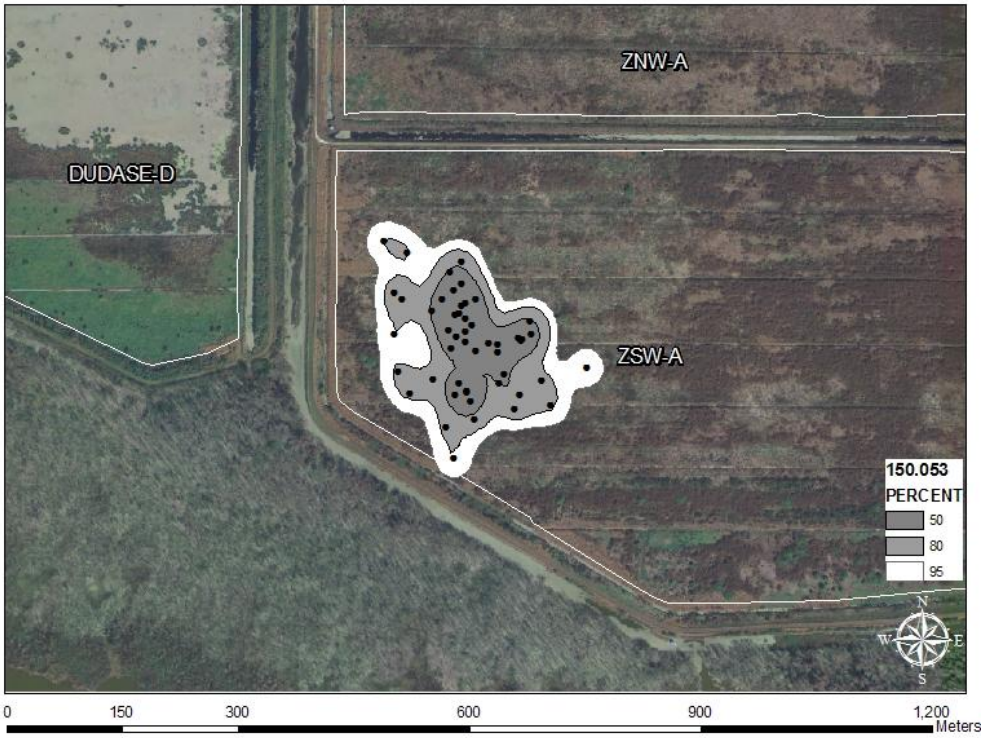
Appendix E-22. Home range of FWC 32199 originally from Lake Apopka. Radio 150.785, Female, TL=100.5 cm.



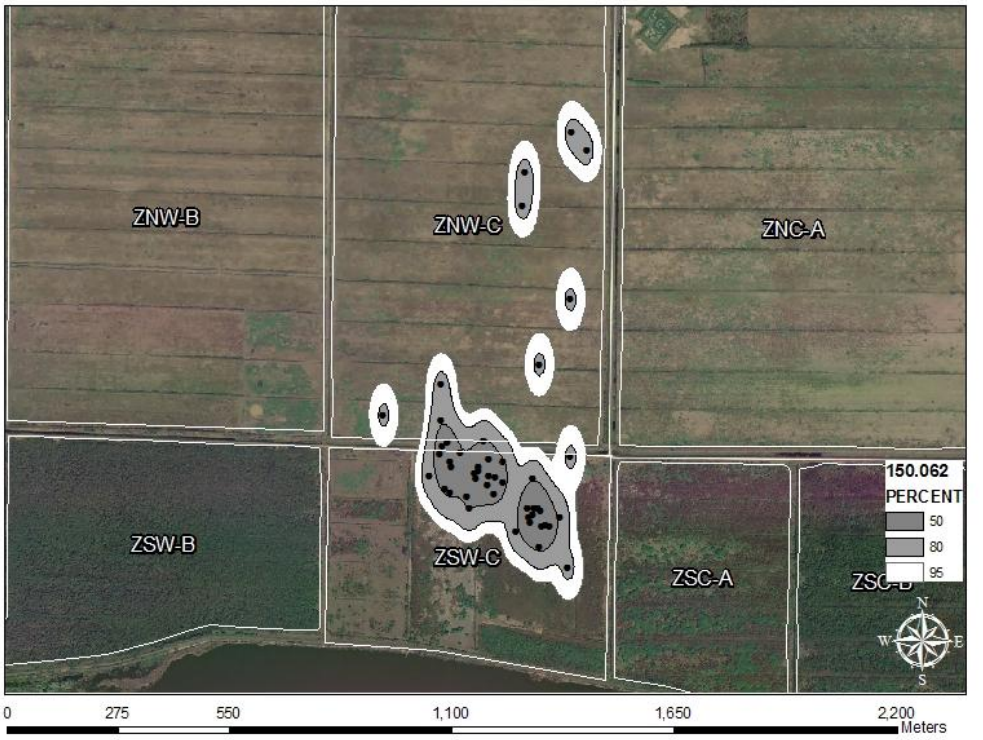
Appendix E-23. Home range of FWC 32182 originally from Phase 1. Radio 150.021, Male, TL=122.9 cm.



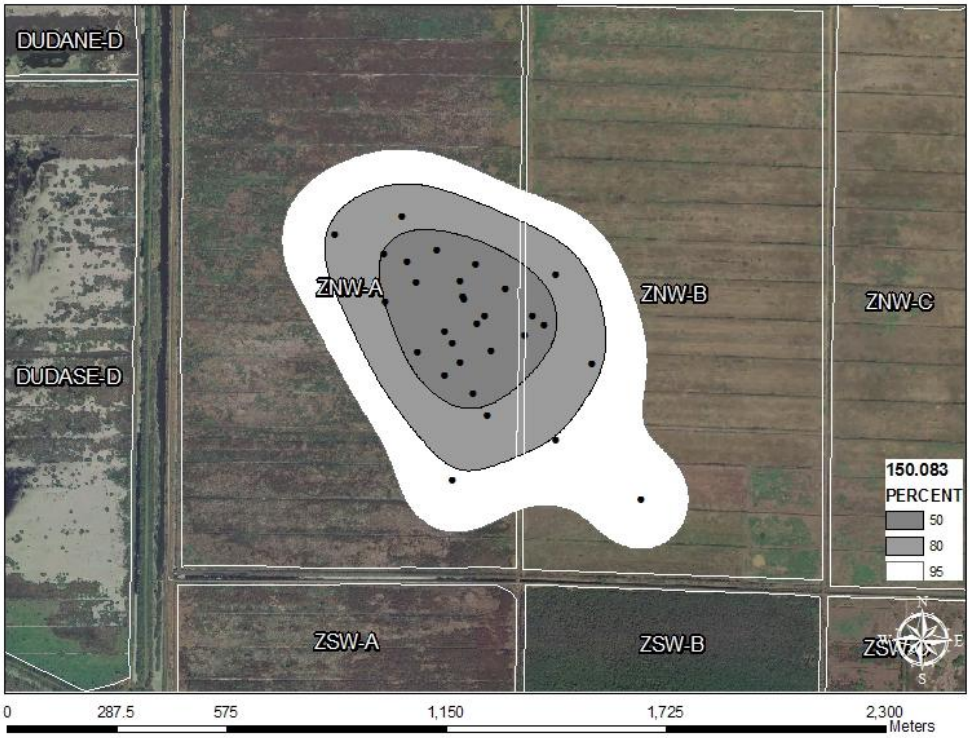
Appendix E-24. Home range of FWC 32181 originally from Phase 1. Radio 150.053, Female, TL=132.8 cm.



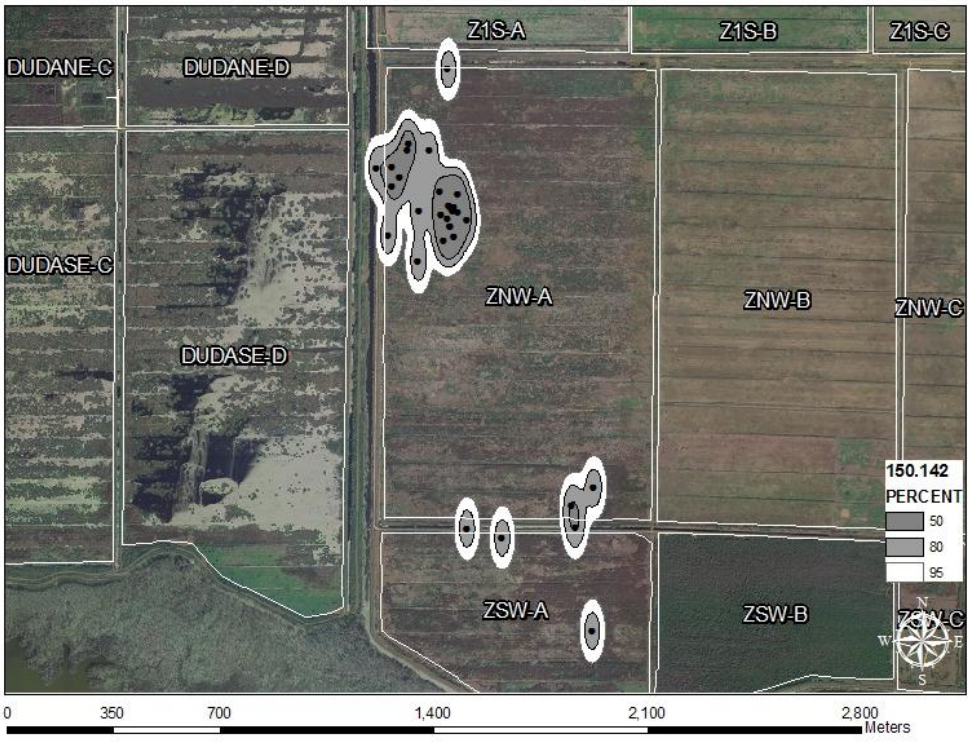
Appendix E-25. Home range of FWC 32189 originally from Phase 1. Radio 150.062, Male, TL=94.7 cm.



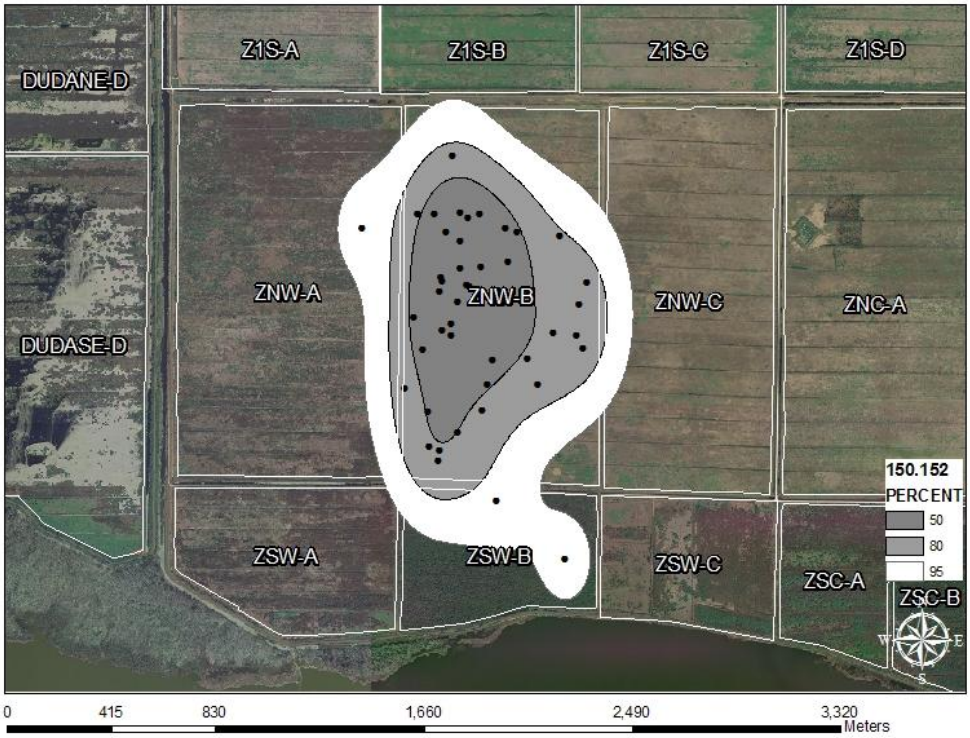
Appendix E-26. Home range of FWC 32185 originally from Phase 1. Radio 150.083, Male, TL=116.7 cm.



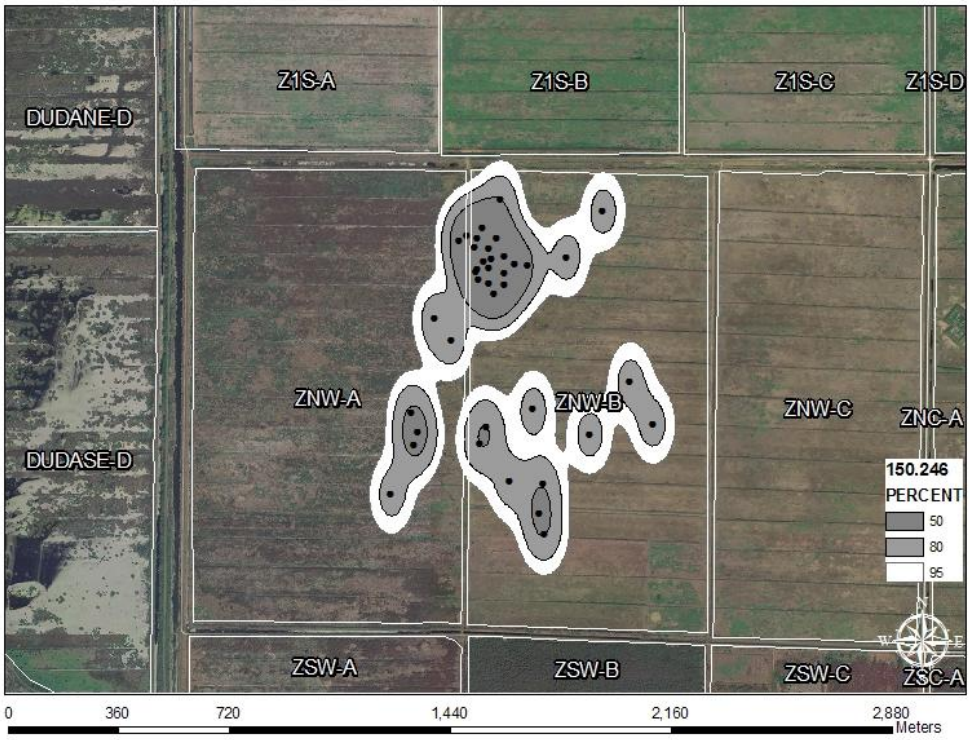
Appendix E-27. Home range of FWC 32178 originally from Phase 1. Radio 150.142, Male, TL=110.2 cm.



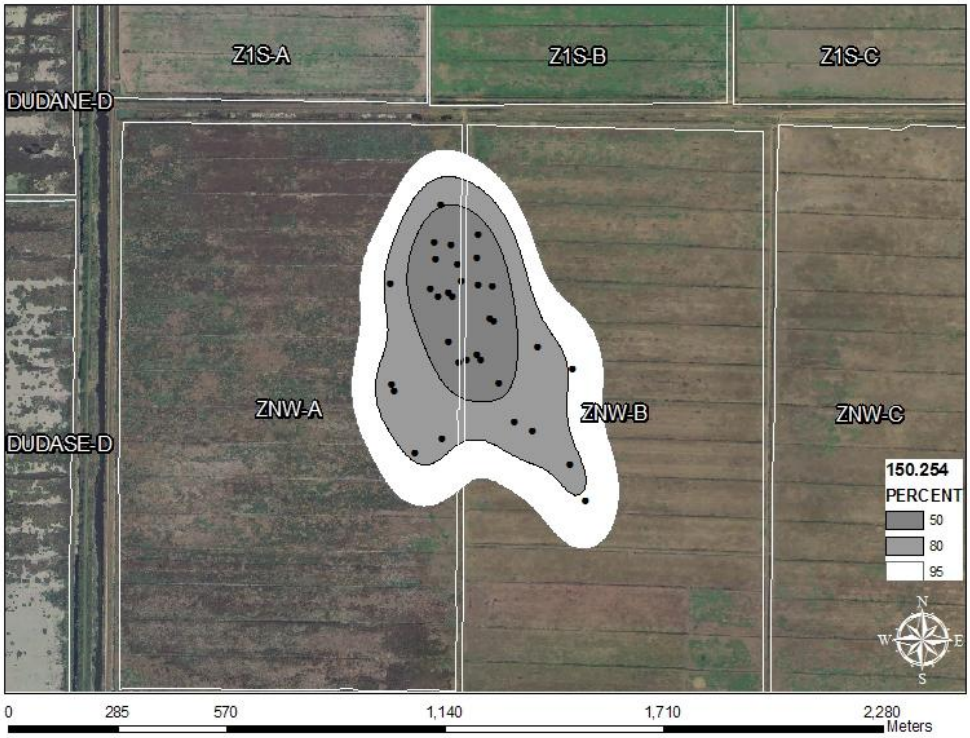
Appendix E-28. Home range of FWC 32186 originally from Phase 1. Radio 150.152, Female, TL=123.6 cm.



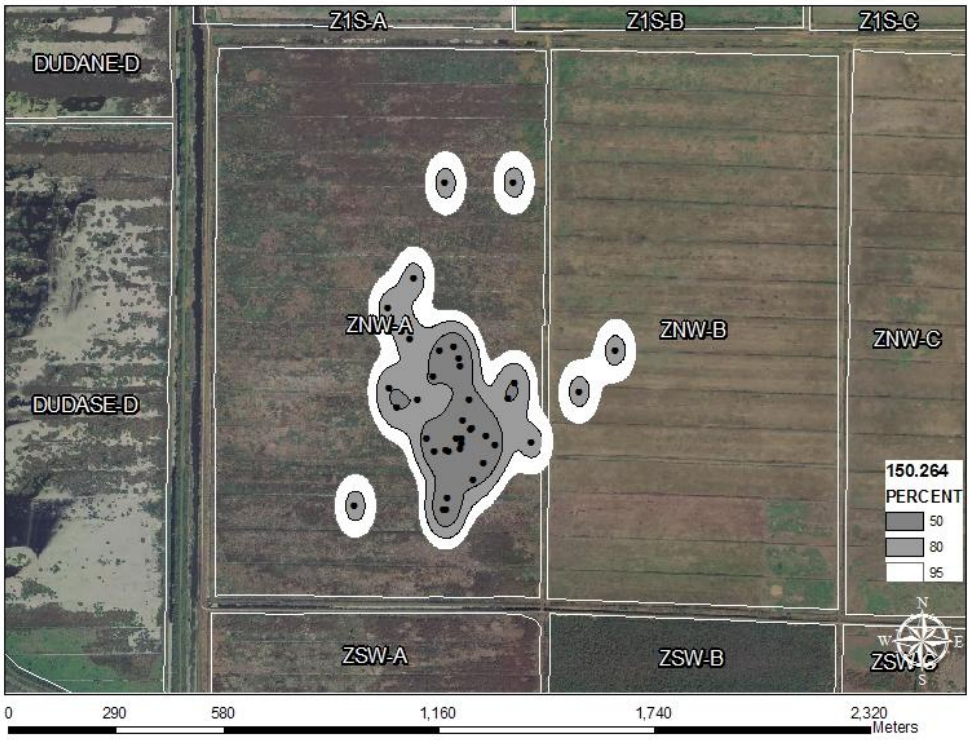
Appendix E-29. Home range of FWC 31209 originally from Phase 1. Radio 150.246, Male, TL=106.9 cm.



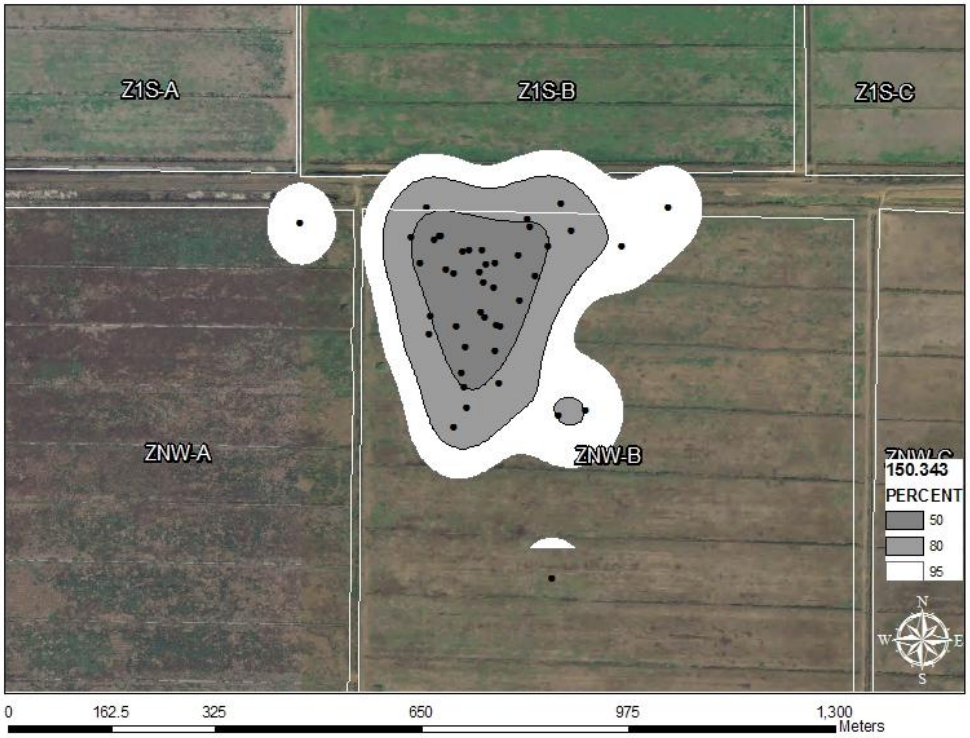
Appendix E-30. Home range of FWC 31210 originally from Phase 1. Radio 150.254, Male, TL=102.0 cm.



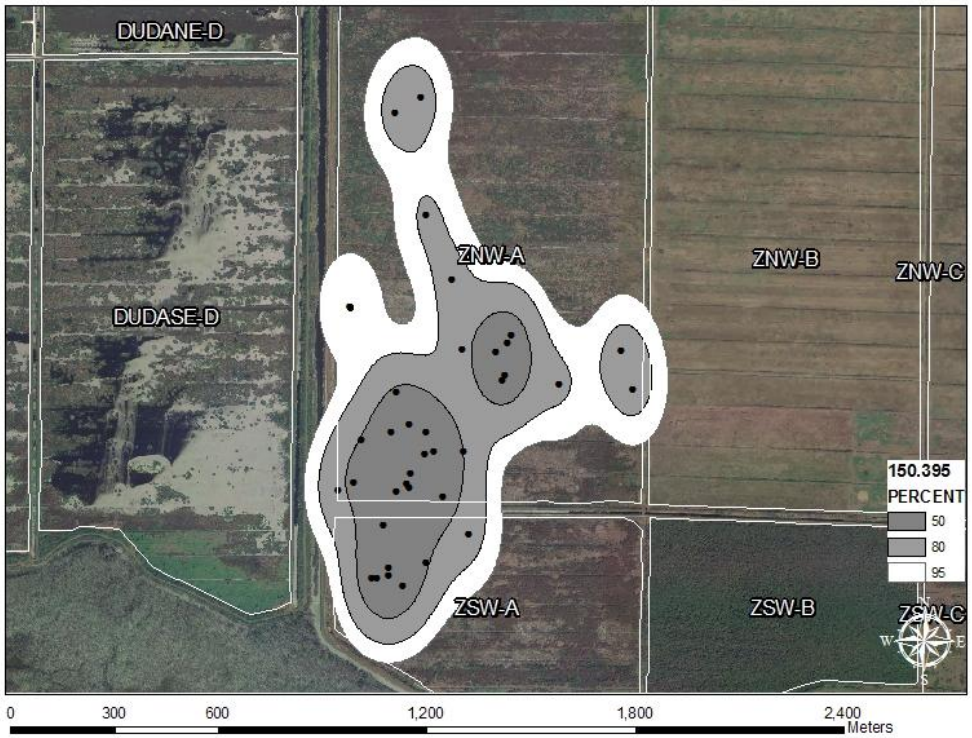
Appendix E-31. Home range of FWC 31218 originally from Phase 1. Radio 150.264, Female, TL=127.9 cm.



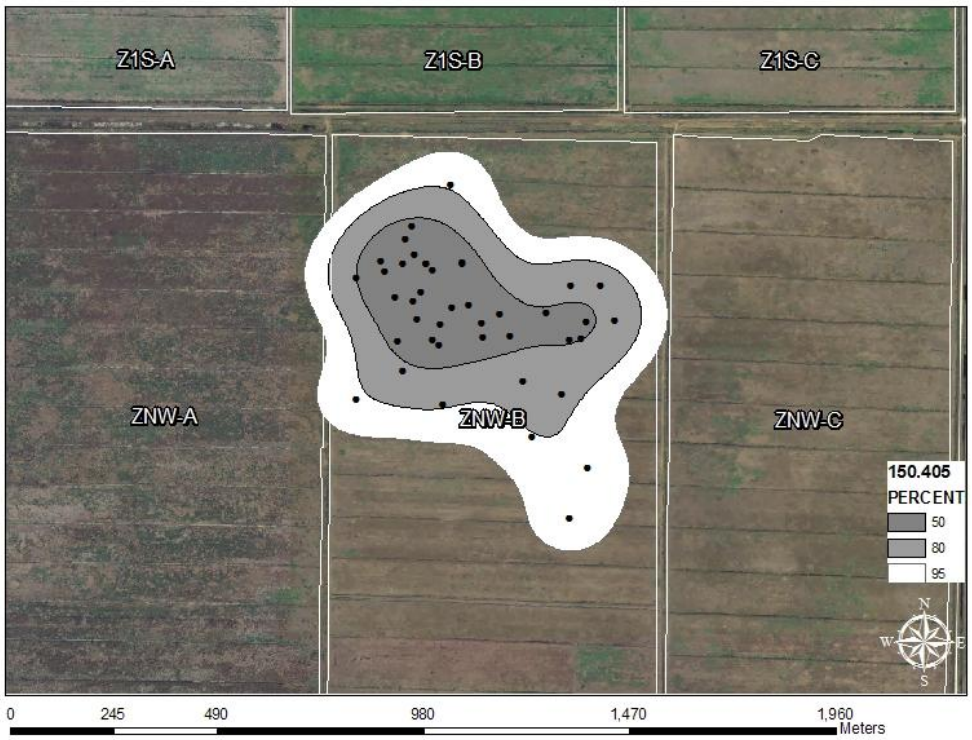
Appendix E-32. Home range of FWC 32190 originally from Phase 1. Radio 150.343, Female, TL=125.3 cm.



Appendix E-33. Home range of FWC 32180 originally from Phase 1. Radio 150.395, Female, TL=142.3 cm.

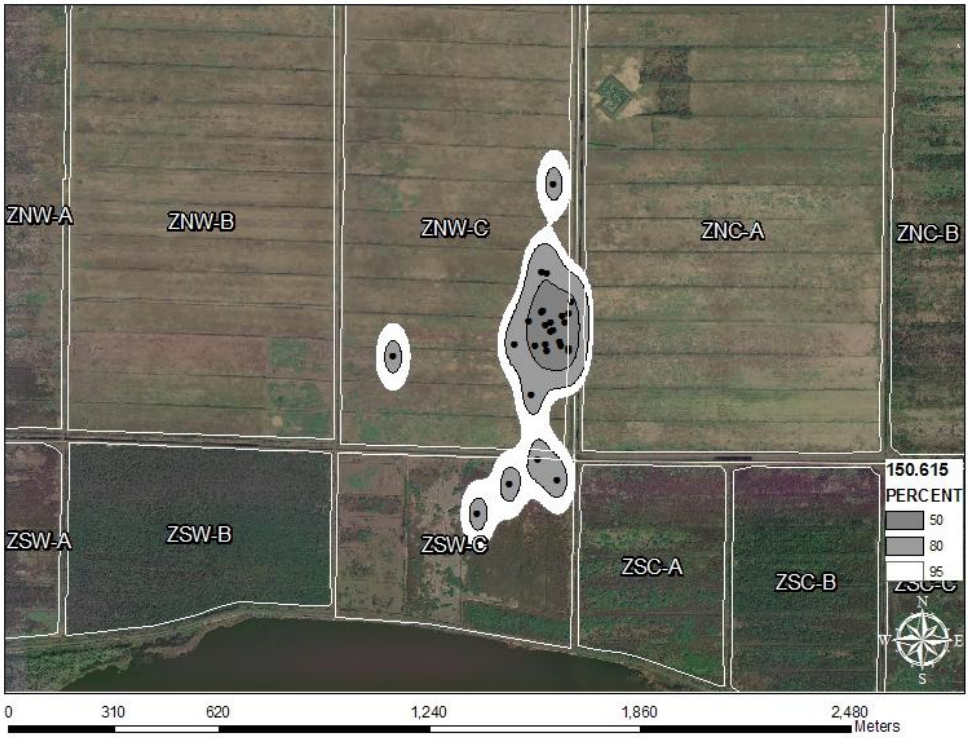


Appendix E-34. Home range of FWC 32184 originally from Phase 1. Radio 150.405, Male, TL=102.4 cm.

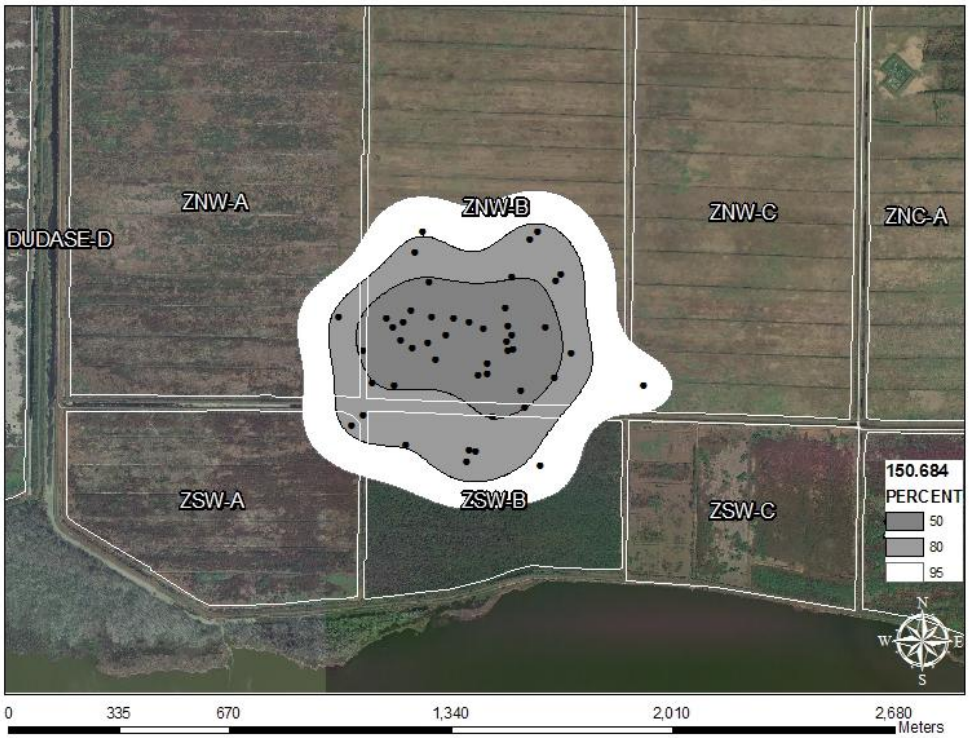


Appendix E-35. Home range of FWC 32188 originally from Phase 1. Radio 150.425, Male, TL=105.0 cm.

Appendix E-36. Home range of FWC 31892 originally from Phase 1. Radio 150.615, Male, TL=114.5 cm.

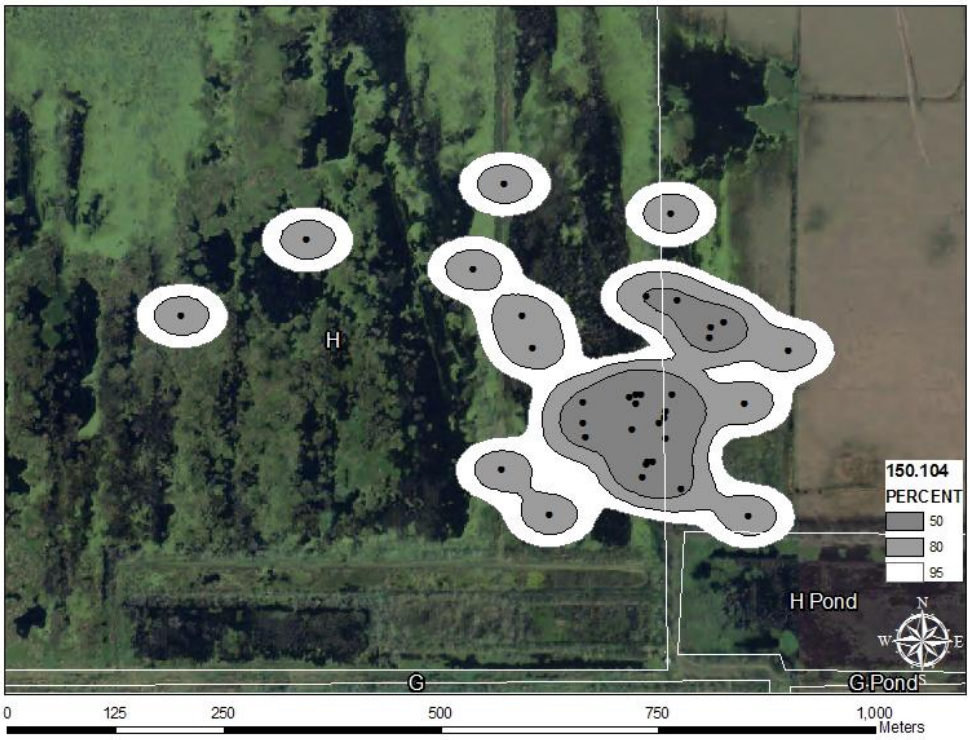


Appendix E-37. Home range of FWC 32183 originally from Phase 1. Radio 150.684, Female, TL=97.5 cm.



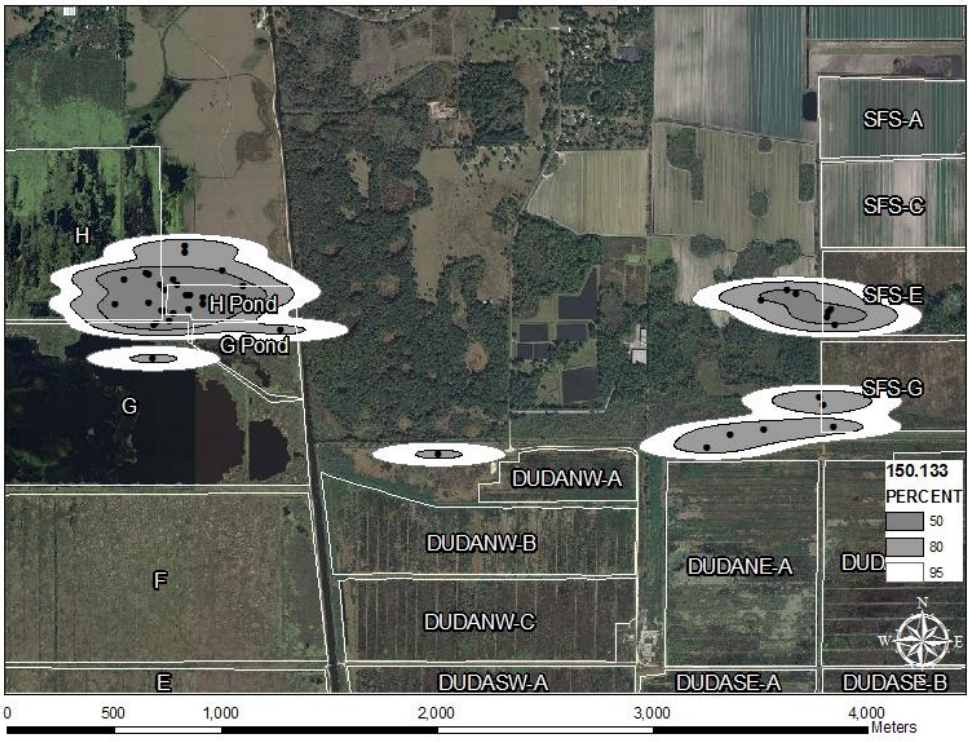
Appendix E-38. Home range of FWC 32059 originally from West Marsh, Radio 150.042, Female, TL=97.7 cm.

Appendix E-39. Home range of FWC 32054 originally from West Marsh, Radio 150.104, Female, TL=90.4 cm.

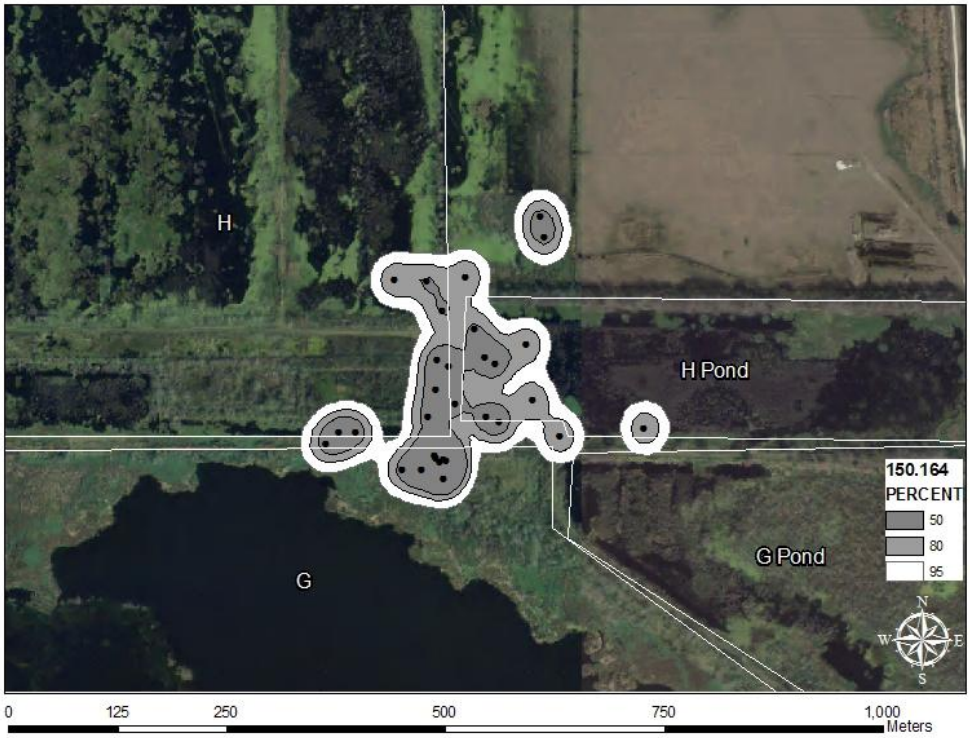


Appendix E-40. Home range of FWC 32073 originally from West Marsh, Radio 150.112, Female, TL=96.6 cm.

Appendix E-41. Home range of FWC 31217 originally from West Marsh, Radio 150.133, Male, TL=92.4 cm.

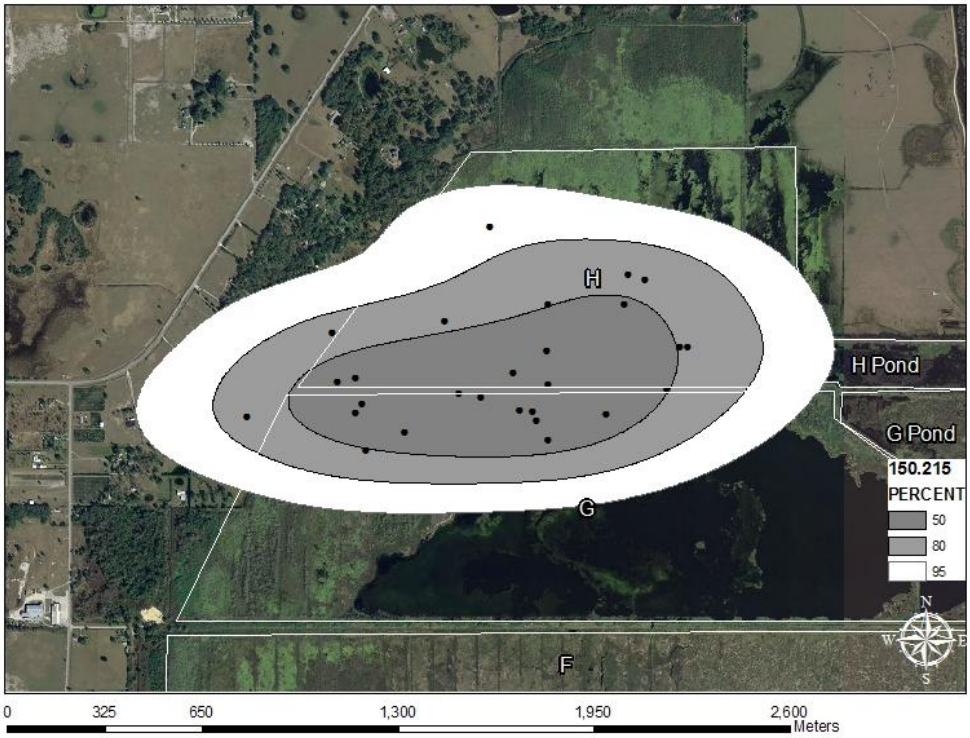


Appendix E-42. Home range of FWC 32053 originally from West Marsh, Radio 150.164, Female, TL=95.1 cm.

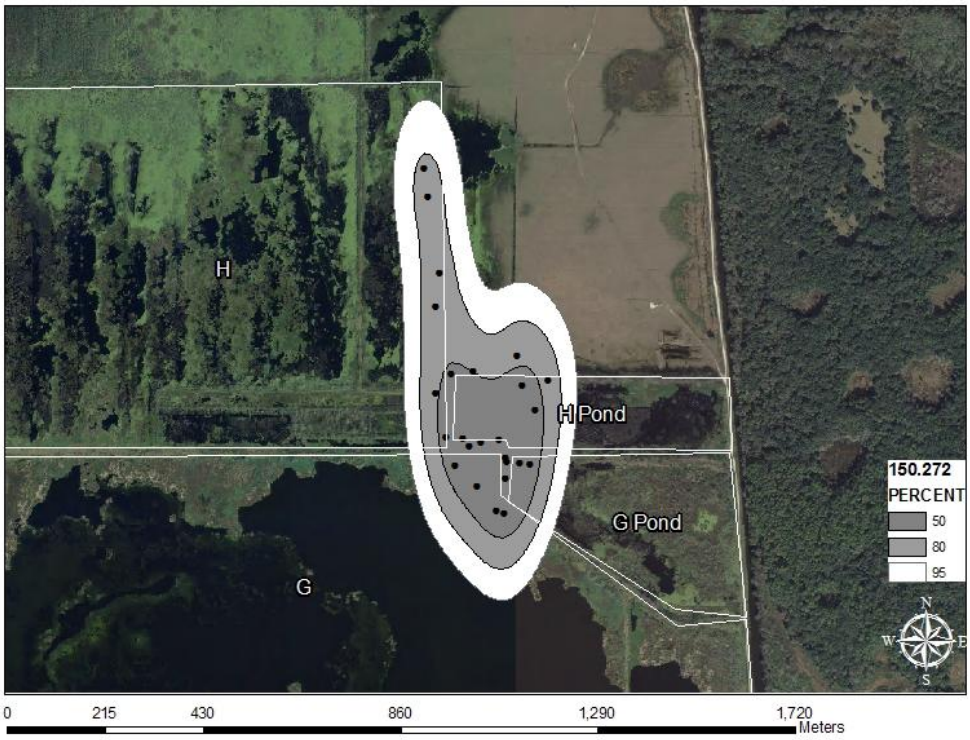


Appendix E-43. Home range of FWC 31222 originally from West Marsh, Radio 150.205, Male, TL=112.1 cm.

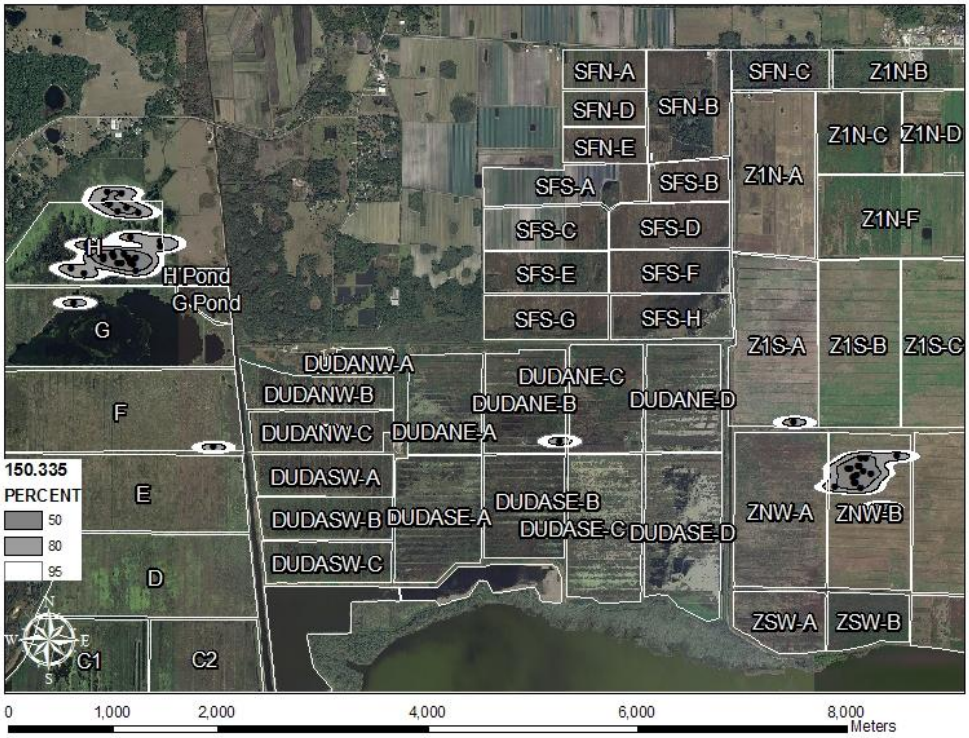
Appendix E-44. Home range of FWC 31215 originally from West Marsh, Radio 150.215, Female, TL=105.9 cm.



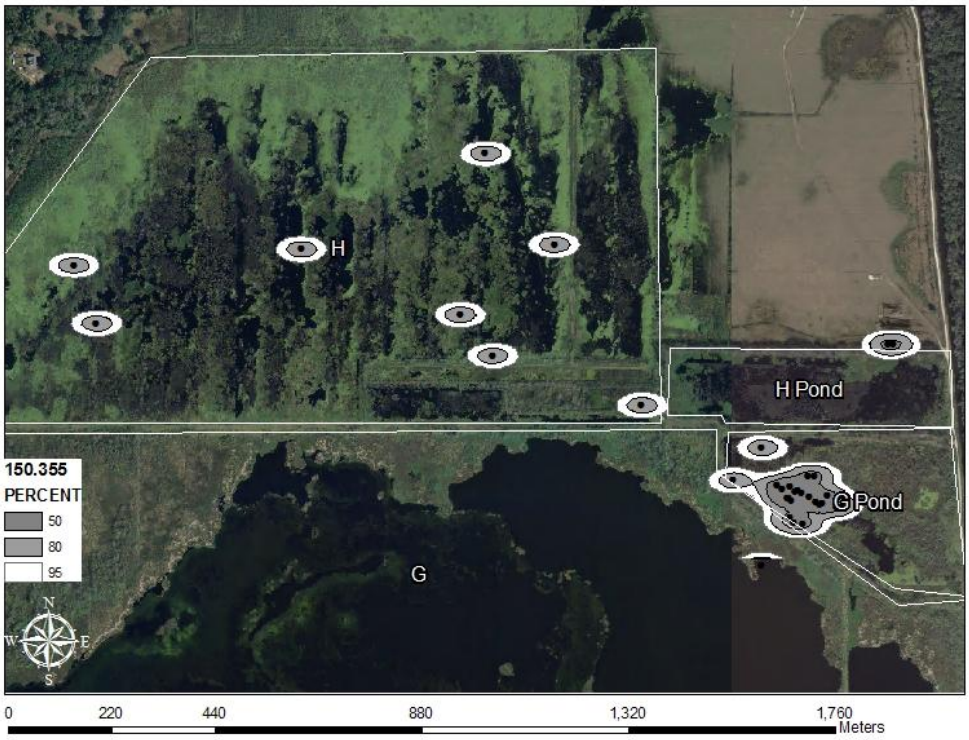
Appendix E-45. Home range of FWC 31212 originally from West Marsh, Radio 150.272, Male, TL=114.4 cm.



Appendix E-46. Home range of FWC 31201 originally from West Marsh, Radio 150.335, Male, TL=102.8 cm.



Appendix E-47. Home range of FWC 32052 originally from West Marsh, Radio 150.355, Male, TL=98.8 cm.

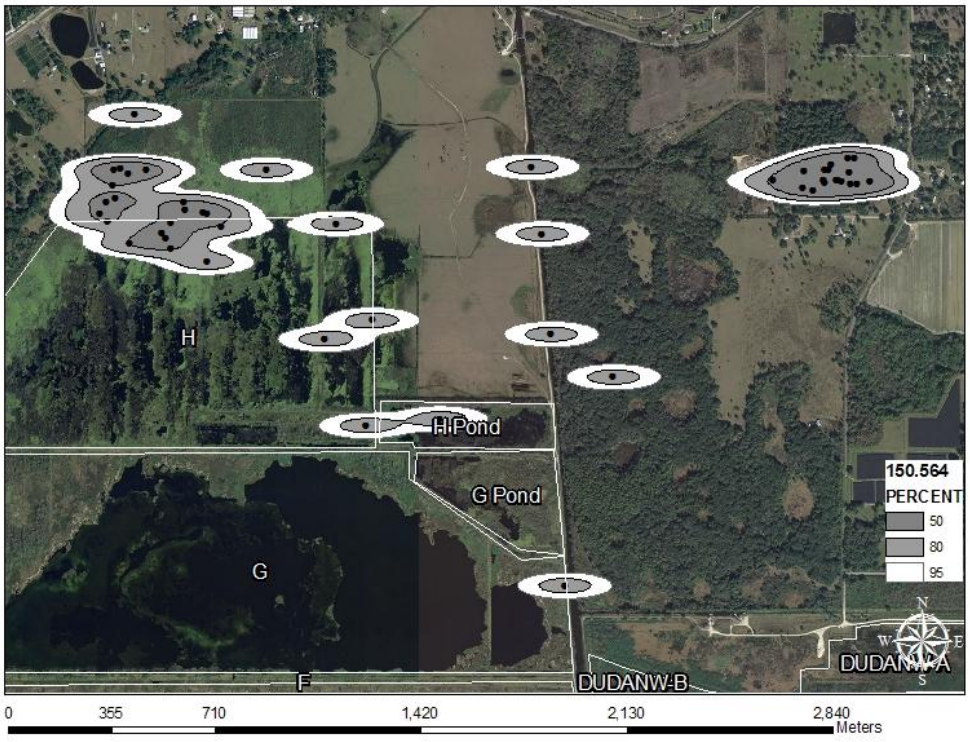


Appendix E-48. Home range of FWC 32051 originally from West Marsh, Radio 150.383, Male, TL=94.0 cm.

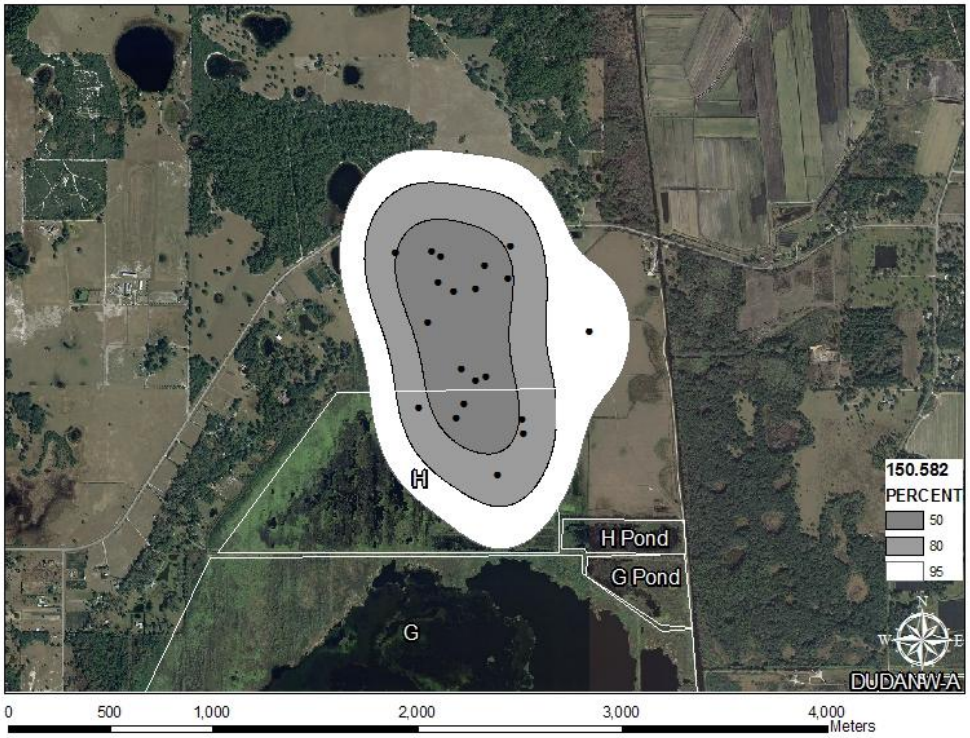
Appendix E-49. Home range of FWC 32056 originally from West Marsh, Radio 150.413, Male, TL=110.5 cm.

Appendix E-50. Home range of FWC 32061 originally from West Marsh, Radio 150.554, Male, TL=120.0 cm.

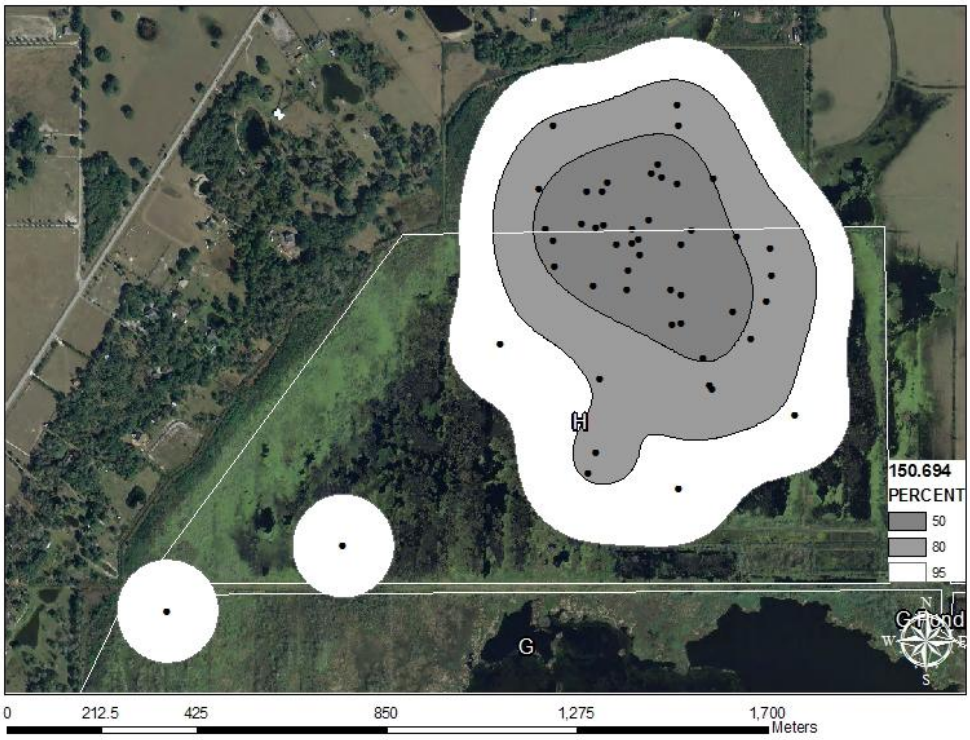
Appendix E-51. Home range of FWC 32064 originally from West Marsh, Radio 150.564, Male, TL=92.0 cm.



‘Appendix E-52. Home range of FWC 32071 originally from West Marsh, Radio 150.582, Female, TL=97.1 cm.



Appendix E-53. Home range of FWC 32063 originally from West Marsh, Radio 150.694, Female, TL=106.5 cm.



APPENDIX F
ALLIGATOR OCP ANALYSIS FIELD DATA

Appendix F-1: Field data for hatchling alligators used for OCP analysis in 2008

tag number	study unit	captured	capture latitude	capture longitude	TL (cm)	SVL (cm)	HL (cm)	TG (cm)	WT (g)	SEX	sacrificed	chain of custody number	nest ID code	nest lat	nest long
FWC14752	LK	8/4/2008	28.67728	81.63514	49.8	24.6	7	10	290	M	8/8/2008	FWC14752-H-080808	AP-07-304	28.67723	81.63358
FWC15388	LK	8/4/2008	28.67274	81.67546	54.6	25.9	7.3	11.5	365	M	8/8/2008	FWC15388-H-080808	AP-07-301	28.67274	81.67504
FWC14616	LK	8/4/2008	28.61992	81.68128	42.5	20.5	6.1	7.9	155	M	8/8/2008	FWC14616-H-080808	AP-07-204	28.62018	81.68173
FWC13564	LK	8/4/2008	28.67856	8163916	48.7	23.2	7	9.1	240	M	8/8/2008	FWC13564-H-080808	AP-07-305	28.67876	81.63979
FWC15475	LK	8/4/2008	28.64459	81.69331	46.2	22.5	6.6	8.8	240	M	8/8/2008	FWC15475-H-080808	AP-07-202	28.64475	81.6934
FWC13425	WM	8/6/2008	28.70296	81.6939	47	22.8	7	9	230	M	8/8/2008	FWC13425-H-080808	ARA-07-10	28.70766	81.68597

FWC13860	WM	8/6/2008	28.71132	81.69326	46.7	23.1	6.5	9	210	M	8/8/2008	FWC13860-H-080808	ARA-07-106	28.42669	81.41715
FWC13810	WM	8/6/2008	28.71145	81.69315	47.8	23.4	6.8	6.1	235	M	8/8/2008	FWC13810-H-080808	ARA-07-104	28.42646	81.41619
FWC14584	WM	8/4/2008	28.71077	81.69604	46	22.4	6.7	9.2	220	M	8/8/2008	FWC14584-H-080808	ARA-07-105	28.42659	81.41778
FWC15260	WM	8/6/2008	28.7031	81.68426	53.2	25	7.2	11.1	310	M	8/8/2008	FWC15260-H-080808	ARA-07-101	28.42183	81.4106
FWC15731	U2W	8/6/2008	28.68373	81.61576	49.2	23.8	6.6	9.3	260	M	8/8/2008	FWC15731-H-080808	ARA-07-117	28.67954	81.61592
FWC15602	U2W	8/5/2008	28.68332	81.61001	58.1	28.4	8	11.5	485	M	8/8/2008	FWC15602-H-080808	ARA-07-127	28.68414	81.62916
FWC15212	U2W	8/6/2008	28.68366	81.61539	55.2	26.7	7	10.4	345	M	8/8/2008	FWC15212-H-080808	ARA-07-116	28.67978	81.61639
FWC15615	U2W	8/5/2008	28.6841	81.60952	56.8	27.4	7.4	11.7	440	M	8/8/2008	FWC15615-H-080808	ARA-07-127	28.68414	81.62916
FWC15736	U2W	8/6/2008	28.68373	81.61576	42.8	21.2	6.1	8	195	M	8/8/2008	FWC15736-	ARA-	28.67954	81.61592

												H-080808	07-117		
FWC15173	DU	8/6/2008	28.70431	81.63506	40.6	20.3	5.7	7.8	160	M	8/8/2008	FWC15173-H-080808	ARA-07-601	28.70481	81.63515
FWC13671	DU	8/6/2008	28.69251	81.6348	50.2	25.4	7	10.4	310	M	8/8/2008	FWC13671-H-080808	ARA-07-602	28.69321	81.63493

Appendix F-2: Field data for juvenile alligators used for OCP analysis 2008

TAG number	study unit	captured	latitude	longitude	Initial TL (cm)	Initial SVL (cm)	Initial HL (cm)	Initial TG (cm)	Initial W (g)	sex	Final TL	Final SVL	Final HL	Final TG	Final W	sacrificed
FWC31896	LK	7/21/2008	28.67331	81.67336	102	53.8	14.4	22.8	3600	F	100.9	53.3	14.6	21.1	3200	8/8/2008
FWC31832	LK	7/21/2008	28.68271	81.65823	134	66	18	26.8	5600	M	132.4	65.4	17.5	25.9	5600	8/8/2008
FWC31898	LK	7/21/2008	28.67065	81.68049	124	62.2	17.3	26	5250	F	122.2	61.8	17.3	25.4	4850	8/8/2008
FWC31899	LK	7/21/2008	28.66302	81.68396	104.6	50.9	14.4	19.7	x	M	104.9	50.7	19.4	15.5	2650	8/8/2008
FWC31803	WM	7/21/2008	28.71565	81.69916	103.5	50.4	13.5	20.8	3000	F	102.8	50.2	13.8	20.5	2600	8/8/2008
FWC31847	WM	7/21/2008	28.7151	81.69804	113.5	56.5	15.7	22.9	4000	F	113.5	56.6	15.6	22.1	3550	8/8/2008
FWC31835	WM	7/21/2008	28.71565	81.69220	107.4	51.9	13.8	23	3450	F	106.9	52	13.8	22.2	3100	8/8/2008
FWC31813	U2W	7/21/2008	28.69387	81.61942	103.2	51	13.9	20.7	3100	F	102.9	50.7	14	20.6	2800	8/8/2008
FWC31838	U2W	7/21/2008	28.6896	81.62900	136	73.8	19.6	31.3	9150	F	135.5	73.5	19.4	30.4	8500	8/8/2008
FWC31831	U2W	7/21/2008	28.69155	81.61984	128	64.5	17.5	26.8	6300	M	126.9	64.5	17.6	26.2	5500	8/8/2008
FWC31839	U2W	7/21/2008	28.68775	81.62925	123	61.4	16.6	23.4	4600	M	122.4	60.9	16.3	22.7	4150	8/8/2008
FWC31843	U2W	7/21/2008	28.69155	81.61983	99	47.6	13.2	18.6	2400	F	98.4	47.3	13.5	18.1	2050	8/8/2008
FWC31828	WM	7/28/2008	28.71327	81.69110	101.3	49.5	13.5	22.5	2550	x	100.6	49.3	13.5	21.1	2450	8/15/2008
FWC31891	DUDA	7/28/2008	28.68542	81.65995	99.7	49.8	13.4	21.2	2500	x	98.8	48.9	13.4	20	2200	8/15/2008
FWC31811	DUDA	7/28/2008	28.67979	81.67766	104.4	15	13.4	21.5	2900	M	103.8	51.2	14	21.7	2600	8/15/2008
FWC31842	WM	7/28/2008	28.71293	81.69041	115.5	56.3	16	24.5	4000	M	114	56	15.8	23.9	3600	8/15/2008
FWC31809	LK	7/28/2008	28.67749	81.62968	129	64.5	16.8	28.8	6600	x	129.5	65.1	17.5	27.9	5600	8/15/2008

Appendix F-3: Field data for the juvenile alligators from which blood was sent for analysis in 2009.

STUDY UNIT	RADIO	TAG #	DATE	TL	WEIGHT	SEX	RECAP	1 Week Blood
LAKE	150.534	32508	3/18/2009	147.4		F	YES	3/25/2009
LAKE	150.375	31214	8/26/2008	99.9	2400	F	NO	9/4/2008
LAKE	150.174	31216	8/26/2008	116.1	4250	M	NO	9/4/2008
LAKE	150.825	32119	3/17/2009	130.6	5800	F	YES	3/25/2009
LAKE	150.815	32160	3/25/2009	92.5	2420	F	NO	3/31/2009
LAKE	150.825	32119	3/17/2009	130.6	5800	F	YES	3/25/2009
LAKE	150.775	32157	3/17/2009	116.2	3850	M	NO	3/25/2009
LAKE	150.735	32194	3/17/2009	132.2	5950	M	NO	3/25/2009
LAKE	150.705	32152	3/17/2009	118.5	4450	M	NO	3/25/2009
LAKE	150.604	32110	3/17/2009	113	3260	F	YES	3/25/2009
LAKE	150.544	32158	3/9/2009	99.3	2300	M	NO	3/17/2009
LAKE	150.534	31863	4/15/2009	135	6700		NO	4/22/2009
LAKE	150.525	32154	3/9/2009	97.4	1720	F	YES	3/16/2009
LAKE	150.505	31851	4/16/2009	108.6	3280			4/22/2009
LAKE	150.495	32136	3/9/2009	122.6	5700	F	NO	3/16/2009
LAKE	150.485	32195	3/9/2009	111	3700	F	NO	3/16/2009
LAKE	150.455	32200	3/9/2009	100.9	2650	F	NO	3/16/2009
LAKE	150.435	32173	3/9/2009	94.8	2000	M	NO	3/17/2009
LAKE	150.363	32750	4/9/2009	101	2680	F	NO	4/15/2009
LAKE	150.325	32776	4/9/2009	114.2	4250	F	NO	4/15/2009
LAKE	150.225	32787	4/9/2009	112.7	4150	F	NO	4/15/2009
LAKE	150.072	32168	4/9/2009	102.5	2750		NO	4/15/2009
LAKE	150.505	32198	3/9/2009	125.2	4800	M	YES	3/16/2009
DUDA	150.713	32126	9/18/2008	92	1850	M	NO	9/24/2008
DUDA	150.665	31892	9/17/2008	130.5	7100		NO	9/24/2008
DUDA	150.513	32125	9/18/2008	121.1	5100	M	NO	9/24/2008
DUDA	150.475	32065	9/18/2008	106	2800	M	NO	9/24/2008
DUDA	150.806	32145	3/25/2009	108.7	3600	M	NO	3/31/2009
DUDA	150.764	32150	3/25/2009	96.5	2100	M	NO	3/31/2009
DUDA	150.755	32142	3/25/2009	131	6700	M	NO	3/31/2009
DUDA	150.745	32169	3/25/2009	99.5	2550	M	NO	3/31/2009
DUDA	150.705	32024	4/16/2009	94.3	2200	F	NO	4/22/2009
DUDA	150.624	32151	3/25/2009	114.1	4400	F	NO	3/31/2009
U2W	150.684	32183	8/25/2008	97.5	2600	F	NO	9/4/2008
U2W	150.425	32188	8/26/2008	105	2420	M	NO	9/4/2008
U2W	150.405	32184	8/25/2008	102.4	3100	M	NO	9/4/2008
U2W	150.395	32180	8/25/2008	142.3	9700	F	NO	9/4/2008
U2W	150.053	32181	8/25/2008	132.8	7400	F	NO	9/4/2008
U2W	150.363	32193	8/26/2008	104.8	3000	M	NO	9/4/2008
U2W	150.343	32190	8/26/2008	125.3	5700	F	NO	9/4/2008
U2W	150.194	32176	8/25/2008	93	2250	M	NO	9/4/2008
U2W	150.152	32186	8/25/2008	123.6	5800	F	NO	9/4/2008

STUDY UNIT	RADIO	TAG #	DATE	TL	WEIGHT	SEX	RECAP	1 Week Blood
U2W	150.142	32178	8/25/2008	110.2	3700	M	NO	9/4/2008
U2W	150.112	32177	8/25/2008	108.1	3450	F	NO	9/4/2008
U2W	150.092	32187	8/26/2008	100	2560	F	NO	9/4/2008
U2W	150.083	32185	8/25/2008	116.7	3600	M	NO	9/4/2008
U2W	150.062	32189	8/26/2008	94.7	2300	M	NO	9/4/2008
U2W	150.031	32192	8/26/2008	97.8	2700	F	NO	9/4/2008
U2W	150.021	32182	8/25/2008	122.9	5100	M	NO	9/4/2008
U2W	150.011	32191	8/26/2008	107	3300	F	YES	9/4/2008
U2W	150.835	32161	3/31/2009	110	3500	F	NO	4/8/2009
U2W	150.793	32129	3/31/2009	107.4	3500	F	NO	4/8/2009
U2W	150.636	32771	3/31/2009	112.5	4150	F	YES	4/8/2009
U2W	150.615	31822	3/31/2009	114.5	4490	M	NO	4/8/2009
U2W	150.194	32153	3/31/2009	113.2	4100	F	NO	4/8/2009
WM	150.694	32063	9/17/2008	106.5	3150	F	NO	9/24/2008
WM	150.656	32060	9/17/2008	98	2550	F	NO	9/24/2008
WM	150.564	32064	9/17/2008	92	2020	M	NO	9/24/2008
WM	150.413	32056	9/9/2008	110.5	3425	M	NO	9/17/2008
WM	150.383	32051	9/9/2008	94	2080	F	NO	9/17/2008
WM	150.355	32052	9/9/2008	98.8	2340	M	NO	9/17/2008
WM	150.335	31201	8/27/2008	102.8	2550	M	NO	9/4/2008
WM	150.325	32058	9/9/2008	97.4	2600	M	NO	9/17/2008
WM	150.215	31215	9/9/2008	105.9	2750	F	YES	9/17/2008
WM	150.164	32053	9/9/2008	95.1	2600	F	NO	9/17/2008
WM	150.133	31217	8/27/2008	92.4	1940	M	NO	9/4/2008
WM	150.123	32055	9/9/2008	101.2	2650	F	NO	9/17/2008
WM	150.072	32057	9/9/2008	105	3400	M	NO	9/17/2008
WM	150.042	32059	9/9/2008	97.7	2600	F	NO	9/17/2008
WM	150.464	32062	9/17/2008	99.5	2850	M	NO	9/24/2008
WM	150.112	32073	3/31/2009	96.6	2500	F	NO	4/8/2009
WM	150.011	32069	3/31/2009	95.4	2400	M	NO	4/8/2009
WM	150.554	32061	9/17/2008	120	4650	M	NO	9/24/2008
WM	150.104	32054	9/9/2008	90.4	1980	F	NO	9/17/2008

Appendix F-4: Field data reported for OCP samples collected on the NSRA in 2007, 2008, and 2009.

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
31203-FT	Alligator	15-Aug-07	NSRA	Duda			1	Individual	Fat	3600	2.18	1115
31203-SC	Alligator	15-Aug-07	NSRA	Duda			1	Individual	Scute	3600	0.81	1115
31206-FT	Alligator	15-Aug-07	NSRA	West Marsh			1	Individual	Fat	2400	1.31	995
31206-SC	Alligator	15-Aug-07	NSRA	West Marsh			1	Individual	Scute	2400	1.41	995
31224-BL	Alligator	19-Jun-07	NSRA	West Marsh	G		1	Individual	Blood	5100		1290
31224-FT	Alligator	19-Jun-07	NSRA	West Marsh	G		1	Individual	Fat	5100	4.75	1290
31224-LV	Alligator	19-Jun-07	NSRA	West Marsh	G		1	Individual	Liver	5100	10.26	1290
31224-MS	Alligator	19-Jun-07	NSRA	West Marsh	G		1	Individual	Muscle	5100	10.1	1290
31224-SC	Alligator	19-Jun-07	NSRA	West Marsh	G		1	Individual	Scute	5100	2.02	1290
31225-BL	Alligator	19-Jun-07	NSRA	West Marsh	G		1	Individual	Blood	2200		925
31225-FT	Alligator	19-Jun-07	NSRA	West Marsh	G		1	Individual	Fat	2200	2.95	925

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
31225-LV	Alligator	19-Jun-07	NSRA	West Marsh	G		1	Individual	Liver	2200	13.29	925
31225-MS	Alligator	19-Jun-07	NSRA	West Marsh	G		1	Individual	Muscle	2200	15.3	925
31225-SC	Alligator	19-Jun-07	NSRA	West Marsh	G		1	Individual	Scute	2200	1.77	925
31225-ST	Alligator	19-Jun-07	NSRA	West Marsh	G		1	Individual	Stomach	2200		925
31297-FT	Alligator	15-Aug-07	NSRA	Phase 1			1	Individual	Fat	1400	3.07	764
31297-SC	Alligator	15-Aug-07	NSRA	Phase 1			1	Individual	Scute	1400	0.62	764
31298-FT	Alligator	15-Aug-07	NSRA	Phase 1			1	Individual	Fat	4200	1.98	1158
31298-SC	Alligator	15-Aug-07	NSRA	Phase 1			1	Individual	Scute	4200	0.78	1158
31299-BL	Alligator	19-Jun-07	NSRA	Duda			1	Individual	Blood	5600		1175
31299-FT	Alligator	19-Jun-07	NSRA	Duda			1	Individual	Fat	5600	3	1175
31299-LV	Alligator	19-Jun-07	NSRA	Duda			1	Individual	Liver	5600	11.3	1175
31299-MS	Alligator	19-Jun-07	NSRA	Duda			1	Individual	Muscle	5600	15	1175

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
31299-SC	Alligator	19-Jun-07	NSRA	Duda			1	Individual	Scute	5600	1.71	1175
31300-BL	Alligator	19-Jun-07	NSRA	Duda			1	Individual	Blood	2100		926
31300-FT	Alligator	19-Jun-07	NSRA	Duda			1	Individual	Fat	2100	1.5	926
31300-LV	Alligator	19-Jun-07	NSRA	Duda			1	Individual	Liver	2100	10.18	926
31300-MS	Alligator	19-Jun-07	NSRA	Duda			1	Individual	Muscle	2100	12.3	926
31300-SC	Alligator	19-Jun-07	NSRA	Duda			1	Individual	Scute	2100	0.63	926
37177-BL	Alligator	19-Jun-07	Lake Apopka				1	Individual	Blood	1600		890
37177-FT	Alligator	19-Jun-07	Lake Apopka				1	Individual	Fat	1600	3	890
37177-LV	Alligator	19-Jun-07	Lake Apopka				1	Individual	Liver	1600	11.51	890
37177-MS	Alligator	19-Jun-07	Lake Apopka				1	Individual	Muscle	1600	9.46	890
37177-SC	Alligator	19-Jun-07	Lake Apopka				1	Individual	Scute	1600	0.64	890
37194-BL	Alligator	19-Jun-07	Lake Apopka				1	Individual	Blood	2000		925

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
37194-FT	Alligator	19-Jun-07	Lake Apopka				1	Individual	Fat	2000	0.78	925
37194-LV	Alligator	19-Jun-07	Lake Apopka				1	Individual	Liver	2000	10.42	925
37194-MS	Alligator	19-Jun-07	Lake Apopka				1	Individual	Muscle	2000	9.73	925
37194-SC	Alligator	19-Jun-07	Lake Apopka				1	Individual	Scute	2000	0.33	925
AP-07-108	Alligator	05-Jul-07	Lake Apopka				1	Individual	Egg Yolk	10	10	
AP-07-109 A	Alligator	05-Jul-07	Lake Apopka				1	Individual	Egg Yolk	10	10	
AP-07-109 B	Alligator	05-Jul-07	Lake Apopka				1	Individual	Egg Yolk	10	10	
AP-07-110	Alligator	05-Jul-07	Lake Apopka				1	Individual	Egg Yolk	10	10	
AP-07-111	Alligator	05-Jul-07	Lake Apopka				1	Individual	Egg Yolk	10	10	
AP-07-112	Alligator	05-Jul-07	Lake Apopka				1	Individual	Egg Yolk	10	10	
AP-07-113	Alligator	05-Jul-07	Lake Apopka				1	Individual	Egg Yolk	10	10	
AP-07-114	Alligator	05-Jul-07	Lake Apopka				1	Individual	Egg Yolk	10	10	

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
AP-07-201	Alligator	02-Jul-07	Lake Apopka				1	Individual	Egg Yolk	10	10	
AP-07-202	Alligator	02-Jul-07	Lake Apopka				1	Individual	Egg Yolk	10	10	
AP-07-203	Alligator	02-Jul-07	Lake Apopka				1	Individual	Egg Yolk	10	10	
AP-07-204	Alligator	02-Jul-07	Lake Apopka				1	Individual	Egg Yolk	10	10	
AP-07-301	Alligator	02-Jul-07	Lake Apopka				1	Individual	Egg Yolk	10	10	
AP-07-303	Alligator	02-Jul-07	Lake Apopka				1	Individual	Egg Yolk	10	10	
AP-07-304	Alligator	02-Jul-07	Lake Apopka				1	Individual	Egg Yolk	10	10	
AP-07-306	Alligator	02-Jul-07	Lake Apopka				1	Individual	Egg Yolk	10	10	
AP-07-307	Alligator	05-Jul-07	Lake Apopka				1	Individual	Egg Yolk	10	10	
AP-07-308	Alligator	05-Jul-07	Lake Apopka				1	Individual	Egg Yolk	10	10	
AP-07-309	Alligator	05-Jul-07	Lake Apopka				1	Individual	Egg Yolk	10	10	
AP-07-310	Alligator	05-Jul-07	Lake Apopka				1	Individual	Egg Yolk	10	10	

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
AP-07-311	Alligator	05-Jul-07	Lake Apopka				1	Individual	Egg Yolk	10	10	
AP-07-312	Alligator	05-Jul-07	Lake Apopka				1	Individual	Egg Yolk	10	10	
AP-07-313	Alligator	05-Jul-07	Lake Apopka				1	Individual	Egg Yolk	10	10	
AP-07-401	Alligator	02-Jul-07	Lake Apopka				1	Individual	Egg Yolk	10	10	
AP-07-402	Alligator	08-Jul-07	Lake Apopka				1	Individual	Egg Yolk	10	10	
AP-07-403	Alligator	08-Jul-07	Lake Apopka				1	Individual	Egg Yolk	10	10	
AP-07-404	Alligator	08-Jul-07	Lake Apopka				1	Individual	Egg Yolk	10	10	
AP-07-405	Alligator	08-Jul-07	Lake Apopka				1	Individual	Egg Yolk	10	10	
AP-07-406	Alligator	08-Jul-07	Lake Apopka				1	Individual	Egg Yolk	10	10	
AP-07-408	Alligator	12-Jul-07	Lake Apopka				1	Individual	Egg Yolk	10	10	
ARA-07-10	Alligator	27-Jul-07	NSRA	West Marsh	G		1	Individual	Egg Yolk	10	10	
ARA-07-101	Alligator	02-Jul-07	NSRA	West Marsh	G		1	Individual	Egg Yolk	10	10	

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
ARA-07-102	Alligator	02-Jul-07	NSRA	West Marsh	G		1	Individual	Egg Yolk	10	10	
ARA-07-103	Alligator	02-Jul-07	NSRA	West Marsh	G		1	Individual	Egg Yolk	10	10	
ARA-07-104	Alligator	02-Jul-07	NSRA	West Marsh	G		1	Individual	Egg Yolk	10	10	
ARA-07-105	Alligator	02-Jul-07	NSRA	West Marsh	G		1	Individual	Egg Yolk	10	10	
ARA-07-106	Alligator	02-Jul-07	NSRA	West Marsh	G		1	Individual	Egg Yolk	10	10	
ARA-07-107	Alligator	02-Jul-07	NSRA	West Marsh	G		1	Individual	Egg Yolk	10	10	
ARA-07-115	Alligator	08-Jul-07	NSRA	Duda			1	Individual	Egg Yolk	10	10	
ARA-07-116	Alligator	08-Jul-07	NSRA	Phase 1			1	Individual	Egg Yolk	10	10	
ARA-07-117	Alligator	08-Jul-07	NSRA	Phase 1			1	Individual	Egg Yolk	10	10	
ARA-07-118	Alligator	08-Jul-07	NSRA	Phase 1			1	Individual	Egg Yolk	10	10	
ARA-07-119	Alligator	08-Jul-07	NSRA	Duda			1	Individual	Egg Yolk	10	10	
ARA-07-120	Alligator	08-Jul-07	NSRA	Duda			1	Individual	Egg Yolk	10	10	

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
ARA-07-123	Alligator	12-Jul-07	NSRA	Duda			1	Individual	Egg Yolk	10	10	
ARA-07-124	Alligator	12-Jul-07	NSRA	Duda			1	Individual	Egg Yolk	10	10	
ARA-07-125	Alligator	12-Jul-07	NSRA	Duda			1	Individual	Egg Yolk	10	10	
ARA-07-126	Alligator	12-Jul-07	NSRA	Phase 1			1	Individual	Egg Yolk	10	10	
ARA-07-127	Alligator	12-Jul-07	NSRA	Phase 1			1	Individual	Egg Yolk	10	10	
ARA-07-128	Alligator	12-Jul-07	NSRA	Phase 1			1	Individual	Egg Yolk	10	10	
ARA-07-302	Alligator	02-Jul-07	NSRA	Duda			1	Individual	Egg Yolk	10	10	
ARA-07-407	Alligator	12-Jul-07	NSRA	West Marsh	F		1	Individual	Egg Yolk	10	10	
ARA-07-409	Alligator	12-Jul-07	NSRA	West Marsh	G		1	Individual	Egg Yolk	10	10	
ARA-07-410	Alligator	12-Jul-07	NSRA	West Marsh	H		1	Individual	Egg Yolk	10	10	
ARA-07-550	Alligator	12-Jul-07	NSRA	Duda			1	Individual	Egg Yolk	10	10	
ARA-07-601	Alligator	20-Jul-07	NSRA	Duda			1	Individual	Egg Yolk	10	10	

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
ARA-07-602	Alligator	20-Jul-07	NSRA	Duda			1	Individual	Egg Yolk	10	10	
ARA-07-603	Alligator	20-Jul-07	NSRA	Duda			1	Individual	Egg Yolk	10	10	
ARA-07-8	Alligator	27-Jul-07	NSRA	Phase 1			1	Individual	Egg Yolk	10	10	
ARA-07-9	Alligator	27-Jul-07	NSRA	West Marsh	F		1	Individual	Egg Yolk	10	10	
DU-NWC-07-06	Frog, Pig	09-Aug-07	NSRA	Duda	West	NWC	1	Individual	Whole Body	106.87	106.87	
DU-NWC-07-07	Frog, Pig	09-Aug-07	NSRA	Duda	West	NWC	1	Individual	Whole Body	178.83	178.83	
DU-NWC-07-08	Frog, Pig	09-Aug-07	NSRA	Duda	West	NWC	1	Individual	Whole Body	123.51	123.51	
DU-NWC-07-09	Frog, Pig	09-Aug-07	NSRA	Duda	West	NWC	1	Individual	Whole Body	63.33	63.33	
DU-NWC-	Frog, Pig	09-Aug-07	NSRA	Duda	West	NWC	1	Individual	Whole	84.54	84.54	

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
07-10									Body			
DU-NWC-07-11	Frog, Pig	09-Aug-07	NSRA	Duda	West	NWC	1	Individual	Whole Body	167.78	167.78	
DU-NWC-07-12	Frog, Pig	09-Aug-07	NSRA	Duda	West	NWC	1	Individual	Whole Body	76.91	76.91	
DU-NWC-07-13	Frog, Pig	09-Aug-07	NSRA	Duda	West	NWC	1	Individual	Whole Body	209.71	209.71	
DU-NWC-07-14	Frog, Pig	09-Aug-07	NSRA	Duda	West	NWC	1	Individual	Whole Body	91.24	91.24	
DU-NWC-07-15	Frog, Pig	09-Aug-07	NSRA	Duda	West	NWC	1	Individual	Whole Body	71.87	71.87	
DU-NWC-07-16	Frog, Pig	09-Aug-07	NSRA	Duda	West	NWC	1	Individual	Whole Body	91.85	91.85	
DU-NWC-	Frog, Pig	09-Aug-07	NSRA	Duda	West	NWC	1	Individual	Whole	185.67	185.67	

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
07-17									Body			
DU-NWC-07-18	Frog, Pig	09-Aug-07	NSRA	Duda	West	NWC	1	Individual	Whole Body	186.11	186.11	
DU-NWC-07-19	Frog, Pig	09-Aug-07	NSRA	Duda	West	NWC	1	Individual	Whole Body	84.23	84.23	
DU-NWC-07-20	Frog, Pig	09-Aug-07	NSRA	Duda	West	NWC	1	Individual	Whole Body	152.56	152.56	
DU-SEA-07-02	Frog, Pig	03-Aug-07	NSRA	Duda	East	SEA	1	Individual	Whole Body	182.15	182.15	
DU-SEA-07-03	Frog, Pig	03-Aug-07	NSRA	Duda	East	SEA	1	Individual	Whole Body	111.42	111.42	
DU-SEA-07-04	Frog, Pig	03-Aug-07	NSRA	Duda	East	SEA	1	Individual	Whole Body	28.53	28.53	

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
DU-SEC-07-05	Frog, Pig	06-Aug-07	NSRA	Duda	East	SEC	1	Individual	Whole Body	199.37	199.37	
DU-SWC-07-01	Frog, Pig	14-Jun-07	NSRA	Duda	West	SWC	1	Individual	Whole Body	42.08	42.08	
FWC13425H	Alligator	08-Aug-08	NSRA	West Marsh	G		1	Individual	Hatchling	230	39.7	470
FWC13564H	Alligator	08-Aug-08	Lake Apopka				1	Individual	Hatchling	240	45.2	487
FWC13671H	Alligator	08-Aug-08	NSRA	Duda	East	SED	1	Individual	Hatchling	310	56.1	502
FWC13810H	Alligator	08-Aug-08	NSRA	West Marsh	H		1	Individual	Hatchling	235	44.4	478
FWC13860H	Alligator	08-Aug-08	NSRA	West Marsh	H		1	Individual	Hatchling	210	42.5	467

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
FWC14584H	Alligator	08-Aug-08	NSRA	West Marsh	H		1	Individual	Hatchling	220	35.7	460
FWC14616H	Alligator	08-Aug-08	Lake Apopka				1	Individual	Hatchling	155	31.2	425
FWC14752H	Alligator	08-Aug-08	Lake Apopka				1	Individual	Hatchling	290	53	498
FWC15173H	Alligator	08-Aug-08	NSRA	DUDA	East	NED	1	Individual	Hatchling	160	30	406
FWC15212H	Alligator	08-Aug-08	NSRA	Phase 1		ZSW-C	1	Individual	Hatchling	345	72	552
FWC15260H	Alligator	08-Aug-08	NSRA	West Marsh	G		1	Individual	Hatchling	310	50.8	532
FWC15388H	Alligator	08-Aug-08	Lake Apopka				1	Individual	Hatchling	365	67	546

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
FWC15475H	Alligator	08-Aug-08	Lake Apopka				1	Individual	Hatchling	240	39.5	462
FWC15602H	Alligator	08-Aug-08	NSRA	Phase 1		ZSW-C	1	Individual	Hatchling	485	86.1	581
FWC15615H	Alligator	08-Aug-08	NSRA	Phase 1		ZSW-C	1	Individual	Hatchling	440	77.7	568
FWC15731H	Alligator	08-Aug-08	NSRA	Phase 1		ZSW-C	1	Individual	Hatchling	260	49	492
FWC15736H	Alligator	08-Aug-08	NSRA	Phase 1		ZSW-C	1	Individual	Hatchling	195	37.5	428
FWC31201-WM-090408	Alligator	04-Sep-08	NSRA	West Marsh			1	Individual	Blood			
FWC31214-LK-090408	Alligator	04-Sep-08	Lake Apopka				1	Individual	Blood			

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
FWC31215-WM-091708	Alligator	17-Sep-08	NSRA	West Marsh			1	Individual	Blood			
FWC31216-LK-090408	Alligator	04-Sep-08	Lake Apopka				1	Individual	Blood			
FWC31217-WM-090408	Alligator	04-Sep-08	NSRA	West Marsh			1	Individual	Blood			
FWC31803B	Alligator	21-Jul-08	NSRA	West Marsh	H		1	Individual	Blood	2600		1028
FWC31803B	Alligator	28-Jul-08	NSRA	West Marsh	H		1	Individual	Blood	2600		1028
FWC31803B	Alligator	04-Aug-08	NSRA	West Marsh	H		1	Individual	Blood	2600		1028
FWC31803B	Alligator	08-Aug-08	NSRA	West Marsh	H		1	Individual	Blood	2600		1028
FWC31803F	Alligator	08-Aug-08	NSRA	West Marsh	H		1	Individual	Fat	2600	2.49	1028
FWC31803L	Alligator	08-Aug-08	NSRA	West Marsh	H		1	Individual	Liver	2600		1028
FWC31809B	Alligator	28-Jul-08	Lake Apopka				1	Individual	Blood	5600		1295

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
FWC31809B	Alligator	04-Aug-08	Lake Apopka				1	Individual	Blood	5600		1295
FWC31809B	Alligator	11-Aug-08	Lake Apopka				1	Individual	Blood	5600		1295
FWC31809B	Alligator	15-Aug-08	Lake Apopka				1	Individual	Blood	5600		1295
FWC31809F	Alligator	15-Aug-08	Lake Apopka				1	Individual	Fat	5600	5.28	1295
FWC31809L	Alligator	15-Aug-08	Lake Apopka				1	Individual	Liver	5600	57.4	1295
FWC31811B	Alligator	28-Jul-08	NSRA	Duda	Pond	West	1	Individual	Blood	2600		1038
FWC31811B	Alligator	04-Aug-08	NSRA	Duda	Pond	West	1	Individual	Blood	2600		1038
FWC31811B	Alligator	11-Aug-08	NSRA	Duda	Pond	West	1	Individual	Blood	2600		1038
FWC31811B	Alligator	15-Aug-08	NSRA	Duda	Pond	West	1	Individual	Blood	2600		1038
FWC31811F	Alligator	15-Aug-08	NSRA	Duda	Pond	West	1	Individual	Fat	2600	2.6	1038
FWC31811L	Alligator	15-Aug-08	NSRA	Duda	Pond	West	1	Individual	Liver	2600	29.4	1038
FWC31813B	Alligator	21-Jul-08	NSRA	Phase 1		ZNW-B	1	Individual	Blood	2800		1029

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
FWC31813B	Alligator	28-Jul-08	NSRA	Phase 1		ZNW-B	1	Individual	Blood	2800		1029
FWC31813B	Alligator	04-Aug-08	NSRA	Phase 1		ZNW-B	1	Individual	Blood	2800		1029
FWC31813B	Alligator	08-Aug-08	NSRA	Phase 1		ZNW-B	1	Individual	Blood	2800		1029
FWC31813F	Alligator	08-Aug-08	NSRA	Phase 1		ZNW-B	1	Individual	Fat	2800	4.56	1029
FWC31813L	Alligator	08-Aug-08	NSRA	Phase 1		ZNW-B	1	Individual	Liver	2800	28.6	1029
FWC31822-U2W- 4 8 9	Alligator	8-Apr- 9	NSRA	Phase 1			1	Individual	Blood			
FWC31828B	Alligator	28-Jul-08	NSRA	West Marsh	H		1	Individual	Blood	2450		1006
FWC31828B	Alligator	04-Aug-08	NSRA	West Marsh	H		1	Individual	Blood	2450		1006
FWC31828B	Alligator	11-Aug-08	NSRA	West Marsh	H		1	Individual	Blood	2450		1006
FWC31828B	Alligator	15-Aug-08	NSRA	West Marsh	H		1	Individual	Blood	2450		1006
FWC31828F	Alligator	15-Aug-08	NSRA	West Marsh	H		1	Individual	Fat	2450	2.58	1006

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
FWC31828L	Alligator	15-Aug-08	NSRA	West Marsh	H		1	Individual	Liver	2450	20.9	1006
FWC31831B	Alligator	21-Jul-08	NSRA	Phase 1		ZNW-B	1	Individual	Blood	5500		1269
FWC31831B	Alligator	28-Jul-08	NSRA	Phase 1		ZNW-B	1	Individual	Blood	5500		1269
FWC31831B	Alligator	04-Aug-08	NSRA	Phase 1		ZNW-B	1	Individual	Blood	5500		1269
FWC31831B	Alligator	08-Aug-08	NSRA	Phase 1		ZNW-B	1	Individual	Blood	5500		1269
FWC31831F	Alligator	08-Aug-08	NSRA	Phase 1		ZNW-B	1	Individual	Fat	5500	3.19	1269
FWC31831L	Alligator	08-Aug-08	NSRA	Phase 1		ZNW-B	1	Individual	Liver	5500	60.3	1269
FWC31832B	Alligator	21-Jul-08	Lake Apopka				1	Individual	Blood	5600		1324
FWC31832B	Alligator	28-Jul-08	Lake Apopka				1	Individual	Blood	5600		1324
FWC31832B	Alligator	04-Aug-08	Lake Apopka				1	Individual	Blood	5600		1324
FWC31832B	Alligator	08-Aug-08	Lake Apopka				1	Individual	Blood	5600		1324
FWC31832F	Alligator	08-Aug-08	Lake Apopka				1	Individual	Fat	5600	6.24	1324

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
FWC31832L	Alligator	08-Aug-08	Lake Apopka				1	Individual	Liver	5600	55	1324
FWC31835B	Alligator	21-Jul-08	NSRA	West Marsh	H		1	Individual	Blood	3100		1069
FWC31835B	Alligator	28-Jul-08	NSRA	West Marsh	H		1	Individual	Blood	3100		1069
FWC31835B	Alligator	04-Aug-08	NSRA	West Marsh	H		1	Individual	Blood	3100		1069
FWC31835B	Alligator	08-Aug-08	NSRA	West Marsh	H		1	Individual	Blood	3100		1069
FWC31835F	Alligator	08-Aug-08	NSRA	West Marsh	H		1	Individual	Fat	3100	5.27	1069
FWC31835L	Alligator	08-Aug-08	NSRA	West Marsh	H		1	Individual	Liver	3100	32.4	1069
FWC31838B	Alligator	21-Jul-08	NSRA	Phase 1		ZNW-A	1	Individual	Blood	8500		1355
FWC31838B	Alligator	28-Jul-08	NSRA	Phase 1		ZNW-A	1	Individual	Blood	8500		1355
FWC31838B	Alligator	04-Aug-08	NSRA	Phase 1		ZNW-A	1	Individual	Blood	8500		1355
FWC31838B	Alligator	08-Aug-08	NSRA	Phase 1		ZNW-A	1	Individual	Blood	8500		1355
FWC31838F	Alligator	08-Aug-08	NSRA	Phase 1		ZNW-A	1	Individual	Fat	8500	18.62	1355

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
FWC31838L	Alligator	08-Aug-08	NSRA	Phase 1		ZNW-A	1	Individual	Liver	8500	52.1	1355
FWC31839B	Alligator	21-Jul-08	NSRA	Phase 1		ZNW-A	1	Individual	Blood	4150		1224
FWC31839B	Alligator	28-Jul-08	NSRA	Phase 1		ZNW-A	1	Individual	Blood	4150		1224
FWC31839B	Alligator	04-Aug-08	NSRA	Phase 1		ZNW-A	1	Individual	Blood	4150		1224
FWC31839B	Alligator	08-Aug-08	NSRA	Phase 1		ZNW-A	1	Individual	Blood	4150		1224
FWC31839F	Alligator	08-Aug-08	NSRA	Phase 1		ZNW-A	1	Individual	Fat	4150	3.18	1224
FWC31839L	Alligator	08-Aug-08	NSRA	Phase 1		ZNW-A	1	Individual	Liver	4150	41.1	1224
FWC31842B	Alligator	28-Jul-08	NSRA	West Marsh	H		1	Individual	Blood	3600		1140
FWC31842B	Alligator	04-Aug-08	NSRA	West Marsh	H		1	Individual	Blood	3600		1140
FWC31842B	Alligator	11-Aug-08	NSRA	West Marsh	H		1	Individual	Blood	3600		1140
FWC31842B	Alligator	15-Aug-08	NSRA	West Marsh	H		1	Individual	Blood	3600		1140
FWC31842F	Alligator	15-Aug-08	NSRA	West Marsh	H		1	Individual	Fat	3600	1.8	1140

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
FWC31842L	Alligator	15-Aug-08	NSRA	West Marsh	H		1	Individual	Liver	3600	47.8	1140
FWC31843B	Alligator	21-Jul-08	NSRA	Phase 1		ZNW-B	1	Individual	Blood	2050		984
FWC31843B	Alligator	28-Jul-08	NSRA	Phase 1		ZNW-B	1	Individual	Blood	2050		984
FWC31843B	Alligator	04-Aug-08	NSRA	Phase 1		ZNW-B	1	Individual	Blood	2050		984
FWC31843B	Alligator	08-Aug-08	NSRA	Phase 1		ZNW-B	1	Individual	Blood	2050		984
FWC31843F	Alligator	08-Aug-08	NSRA	Phase 1		ZNW-B	1	Individual	Fat	2050	3.07	984
FWC31843L	Alligator	08-Aug-08	NSRA	Phase 1		ZNW-B	1	Individual	Liver	2050	27	984
FWC31847B	Alligator	21-Jul-08	NSRA	West Marsh	H		1	Individual	Blood	3550		1135
FWC31847B	Alligator	28-Jul-08	NSRA	West Marsh	H		1	Individual	Blood	3550		1135
FWC31847B	Alligator	04-Aug-08	NSRA	West Marsh	H		1	Individual	Blood	3550		1135
FWC31847B	Alligator	08-Aug-08	NSRA	West Marsh	H		1	Individual	Blood	3550		1135
FWC31847F	Alligator	08-Aug-08	NSRA	West Marsh	H		1	Individual	Fat	3550	1.69	1135

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
FWC31847L	Alligator	08-Aug-08	NSRA	West Marsh	H		1	Individual	Liver	3550	37.9	1135
FWC31851-LK- 422 9	Alligator	22-Apr- 9	Lake Apopka				1	Individual	Blood			
FWC31863-LK- 422 9	Alligator	22-Apr- 9	Lake Apopka				1	Individual	Blood			
FWC31891B	Alligator	28-Jul-08	NSRA	Duda	Pond	East	1	Individual	Blood	2200		988
FWC31891B	Alligator	04-Aug-08	NSRA	Duda	Pond	East	1	Individual	Blood	2200		988
FWC31891B	Alligator	11-Aug-08	NSRA	Duda	Pond	East	1	Individual	Blood	2200		988
FWC31891B	Alligator	15-Aug-08	NSRA	Duda	Pond	East	1	Individual	Blood	2200		988
FWC31891F	Alligator	15-Aug-08	NSRA	Duda	Pond	East	1	Individual	Fat	2200	2.08	988
FWC31891L	Alligator	15-Aug-08	NSRA	Duda	Pond	East	1	Individual	Liver	2200	25.9	988
FWC31892-DU-092408	Alligator	24-Sep-08	NSRA	Duda			1	Individual	Blood	0		0

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
FWC31896B	Alligator	21-Jul-08	Lake Apopka				1	Individual	Blood	3200		1009
FWC31896B	Alligator	28-Jul-08	Lake Apopka				1	Individual	Blood	3200		1009
FWC31896B	Alligator	04-Aug-08	Lake Apopka				1	Individual	Blood	3200		1009
FWC31896B	Alligator	08-Aug-08	Lake Apopka				1	Individual	Blood	3200		1009
FWC31896F	Alligator	08-Aug-08	Lake Apopka				1	Individual	Fat	3200	4.25	1009
FWC31896L	Alligator	08-Aug-08	Lake Apopka				1	Individual	Liver	3200	38.8	1009
FWC31898B	Alligator	21-Jul-08	Lake Apopka				1	Individual	Blood	4850		1222
FWC31898B	Alligator	28-Jul-08	Lake Apopka				1	Individual	Blood	4850		1222
FWC31898B	Alligator	04-Aug-08	Lake Apopka				1	Individual	Blood	4850		1222
FWC31898B	Alligator	08-Aug-08	Lake Apopka				1	Individual	Blood	4850		1222
FWC31898F	Alligator	08-Aug-08	Lake Apopka				1	Individual	Fat	4850	6.9	1222
FWC31898L	Alligator	08-Aug-08	Lake Apopka				1	Individual	Liver	4850	44.1	1222

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
FWC31899B	Alligator	21-Jul-08	Lake Apopka				1	Individual	Blood	2650		1049
FWC31899B	Alligator	28-Jul-08	Lake Apopka				1	Individual	Blood	2650		1049
FWC31899B	Alligator	04-Aug-08	Lake Apopka				1	Individual	Blood	2650		1049
FWC31899B	Alligator	08-Aug-08	Lake Apopka				1	Individual	Blood	2650		1049
FWC31899F	Alligator	08-Aug-08	Lake Apopka				1	Individual	Fat	2650	3.39	1049
FWC31899L	Alligator	08-Aug-08	Lake Apopka				1	Individual	Liver	2650	27.3	1049
FWC32 24-DU- 422 9	Alligator	22-Apr- 9	NSRA	Duda			1	Individual	Blood			
FWC32 69-WM- 4 8 9	Alligator	8-Apr- 9	NSRA	West Marsh			1	Individual	Blood			
FWC32 73-WM- 4 8 9	Alligator	8-Apr- 9	NSRA	West Marsh			1	Individual	Blood			
FWC32051-	Alligator	17-Sep-08	NSRA	West Marsh			1	Individual	Blood			

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
WM-091708												
FWC32052-WM-091708	Alligator	17-Sep-08	NSRA	West Marsh			1	Individual	Blood			
FWC32053-WM-091708	Alligator	17-Sep-08	NSRA	West Marsh			1	Individual	Blood			
FWC32054-WM-091708	Alligator	17-Sep-08	NSRA	West Marsh			1	Individual	Blood			
FWC32055-WM-091708	Alligator	17-Sep-08	NSRA	West Marsh			1	Individual	Blood			
FWC32056-WM-091708	Alligator	17-Sep-08	NSRA	West Marsh			1	Individual	Blood			
FWC32057-WM-091708	Alligator	17-Sep-08	NSRA	West Marsh			1	Individual	Blood			
FWC32058-	Alligator	17-Sep-08	NSRA	West Marsh			1	Individual	Blood			

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
WM-091708												
FWC32059-WM-091708	Alligator	17-Sep-08	NSRA	West Marsh			1	Individual	Blood			
FWC32060-WM-092408	Alligator	24-Sep-08	NSRA	West Marsh			1	Individual	Blood			
FWC32061-WM-092408	Alligator	24-Sep-08	NSRA	West Marsh			1	Individual	Blood			
FWC32062-WM-092408	Alligator	24-Sep-08	NSRA	West Marsh			1	Individual	Blood			
FWC32063-WM-092408	Alligator	24-Sep-08	NSRA	West Marsh			1	Individual	Blood			
FWC32064-WM-092408	Alligator	24-Sep-08	NSRA	West Marsh			1	Individual	Blood			
FWC32065-	Alligator	24-Sep-08	NSRA	Duda			1	Individual	Blood			

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
DU-092408												
FWC3211 - LK- 325 9	Alligator	25-Mar- 9	Lake Apopka				1	Individual	Blood			
FWC32119- LK- 325 9	Alligator	25-Mar- 9	Lake Apopka				1	Individual	Blood			
FWC32125- DU-092408	Alligator	24-Sep-08	NSRA	Duda			1	Individual	Blood			
FWC32126- DU-092408	Alligator	24-Sep-08	NSRA	Duda			1	Individual	Blood			
FWC32129- U2W- 4 8 9	Alligator	8-Apr- 9	NSRA	Phase 1			1	Individual	Blood			
FWC32136- LK- 316 9	Alligator	16-Mar- 9	Lake Apopka				1	Individual	Blood			
FWC32142-	Alligator	31-Mar- 9	NSRA	Duda			1	Individual	Blood			

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
DU- 331 9												
FWC32145-DU- 331 9	Alligator	31-Mar- 9	NSRA	Duda			1	Individual	Blood			
FWC3215 -DU- 331 9	Alligator	31-Mar- 9	NSRA	Duda			1	Individual	Blood			
FWC32151-DU- 331 9	Alligator	31-Mar- 9	NSRA	Duda			1	Individual	Blood			
FWC32152-LK- 325 9	Alligator	25-Mar- 9	Lake Apopka				1	Individual	Blood			
FWC32153-U2W- 4 8 9	Alligator	8-Apr- 9	NSRA	Phase 1			1	Individual	Blood			
FWC32154-LK- 316 9	Alligator	16-Mar- 9	Lake Apopka				1	Individual	Blood			
FWC32157-	Alligator	25-Mar- 9	Lake Apopka				1	Individual	Blood			

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
LK- 325 9												
FWC32158-LK- 317 9	Alligator	17-Mar- 9	Lake Apopka				1	Individual	Blood			
FWC3216 -LK- 331 9	Alligator	31-Mar- 9	Lake Apopka				1	Individual	Blood			
FWC32161-U2W- 4 8 9	Alligator	8-Apr- 9	NSRA	Phase 1			1	Individual	Blood			
FWC32168-LK- 415 9	Alligator	15-Apr- 9	Lake Apopka				1	Individual	Blood			
FWC32169-DU- 331 9	Alligator	31-Mar- 9	NSRA	Duda			1	Individual	Blood			
FWC32173-LK- 317 9	Alligator	17-Mar- 9	Lake Apopka				1	Individual	Blood			
FWC32176-	Alligator	04-Sep-08	NSRA	Phase 1			1	Individual	Blood			

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
U2W-090408												
FWC32177-U2W-090408	Alligator	04-Sep-08	NSRA	Phase 1			1	Individual	Blood			
FWC32178-U2W-090408	Alligator	04-Sep-08	NSRA	Phase 1			1	Individual	Blood			
FWC32180-U2W-090408	Alligator	04-Sep-08	NSRA	Phase 1			1	Individual	Blood			
FWC32181-U2W-090408	Alligator	04-Sep-08	NSRA	Phase 1			1	Individual	Blood			
FWC32182-U2W-090408	Alligator	04-Sep-08	NSRA	Phase 1			1	Individual	Blood			
FWC32183-U2W-090408	Alligator	04-Sep-08	NSRA	Phase 1			1	Individual	Blood			
FWC32184-	Alligator	04-Sep-08	NSRA	Phase 1			1	Individual	Blood			

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
U2W-090408												
FWC32185-U2W-090408	Alligator	04-Sep-08	NSRA	Phase 1			1	Individual	Blood			
FWC32186-U2W-090408	Alligator	04-Sep-08	NSRA	Phase 1			1	Individual	Blood			
FWC32187-U2W-090408	Alligator	04-Sep-08	NSRA	Phase 1			1	Individual	Blood			
FWC32188-U2W-090408	Alligator	04-Sep-08	NSRA	Phase 1			1	Individual	Blood			
FWC32189-U2W-090408	Alligator	04-Sep-08	NSRA	Phase 1			1	Individual	Blood			
FWC32190-U2W-090408	Alligator	04-Sep-08	NSRA	Phase 1			1	Individual	Blood			
FWC32191-	Alligator	04-Sep-08	NSRA	Phase 1			1	Individual	Blood			

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
U2W-090408												
FWC32192-U2W-090408	Alligator	04-Sep-08	NSRA	Phase 1			1	Individual	Blood			
FWC32193-U2W-090408	Alligator	04-Sep-08	NSRA	Phase 1			1	Individual	Blood			
FWC32194-LK- 325 9	Alligator	25-Mar- 9	Lake Apopka				1	Individual	Blood			
FWC32195-LK- 316 9	Alligator	16-Mar- 9	Lake Apopka				1	Individual	Blood			
FWC32198-LK- 316 9	Alligator	16-Mar- 9	Lake Apopka				1	Individual	Blood			
FWC32199-LK- 325 9	Alligator	25-Mar- 9	Lake Apopka				1	Individual	Blood			
FWC322 -	Alligator	16-Mar- 9	Lake Apopka				1	Individual	Blood			

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
LK- 316 9												
FWC32508-LK-101008	Alligator	10-Oct-08	Lake Apopka				1	Individual	Blood			
FWC3275 - LK- 415 9	Alligator	15-Apr- 9	Lake Apopka				1	Individual	Blood			
FWC32771-U2W- 4 8 9	Alligator	8-Apr- 9	NSRA	Unit 2	West		1	Individual	Blood			
FWC32776-LK- 415 9	Alligator	15-Apr- 9	Lake Apopka				1	Individual	Blood			
FWC32787-LK- 415 9	Alligator	15-Apr- 9	Lake Apopka				1	Individual	Blood			
GFC 37192-FT	Alligator	15-Aug-07	Lake Apopka				1	Individual	Fat	2600	1.87	906
GFC 37192-	Alligator	15-Aug-07	Lake Apopka				1	Individual	Scute	2600	0.87	906

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
SC												
GFC 37193-FT	Alligator	15-Aug-07	Lake Apopka				1	Individual	Fat	5100	4.63	1268
GFC 37193-SC	Alligator	15-Aug-07	Lake Apopka				1	Individual	Scute	5100	1.19	1268
LA-CI-07-01	Frog, Pig	19-Jun-07	Lake Apopka	Clay Island			1	Individual	Whole Body	104.08	104.08	
LA-CI-07-02	Frog, Pig	19-Jun-07	Lake Apopka	Clay Island			1	Individual	Whole Body	123.74	123.74	
LA-CI-07-03	Frog, Pig	19-Jun-07	Lake Apopka	Clay Island			1	Individual	Whole Body	121.75	121.75	
LA-CI-07-04	Frog, Pig	19-Jun-07	Lake Apopka	Clay Island			1	Individual	Whole Body	70.884	70.884	
LA-CI-07-05	Frog, Pig	19-Jun-07	Lake Apopka	Clay Island			1	Individual	Whole	136.647	136.647	

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
									Body			
LA-CI-07-06	Frog, Pig	19-Jun-07	Lake Apopka	Clay Island			1	Individual	Whole Body	126.36	126.36	
LA-CI-07-07	Frog, Pig	19-Jun-07	Lake Apopka	Clay Island			1	Individual	Whole Body	63.739	63.739	
LA-NE-07-08	Frog, Pig	05-Jul-07	Lake Apopka	Northeast			1	Individual	Whole Body	88.13	88.13	
LA-NE-07-09	Frog, Pig	05-Jul-07	Lake Apopka	Northeast			1	Individual	Whole Body	265.2	265.2	
LA-NE-07-10	Frog, Pig	05-Jul-07	Lake Apopka	Northeast			1	Individual	Whole Body	160.62	160.62	
LA-NE-07-11	Frog, Pig	05-Jul-07	Lake Apopka	Northeast			1	Individual	Whole Body	199.61	199.61	
LA-NE-07-12	Frog, Pig	05-Jul-07	Lake Apopka	Northeast			1	Individual	Whole	157.78	157.78	

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
									Body			
LA-NE-07-13	Frog, Pig	05-Jul-07	Lake Apopka	Northeast			1	Individual	Whole Body	83.42	83.42	
LA-NE-07-14	Frog, Pig	05-Jul-07	Lake Apopka	Northeast			1	Individual	Whole Body	18.78	18.78	
LA-NE-07-16	Frog, Pig	05-Jul-07	Lake Apopka	Northeast			1	Individual	Whole Body	106.67	106.67	
LA-NE-07-17	Frog, Pig	05-Jul-07	Lake Apopka	Northeast			1	Individual	Whole Body	167.06	167.06	
LA-NE-07-18	Frog, Pig	17-Aug-07	Lake Apopka					Individual	Whole Body	99.83	99.83	
LA-NE-07-19	Frog, Pig	17-Aug-07	Lake Apopka					Individual	Whole Body	62.88	62.88	
LA-NE-07-20	Frog, Pig	17-Aug-07	Lake Apopka					Individual	Whole	73.98	73.98	

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
									Body			
U2W-MC-07-02	Frog, Pig	14-Aug-07	NSRA	Unit 2	Canal	McDonald Canal		Individual	Whole Body	34.21	34.21	
U2W-MC-07-03	Frog, Pig	14-Aug-07	NSRA	Unit 2	Canal	McDonald Canal		Individual	Whole Body	189.26	189.26	
U2W-MC-07-04	Frog, Pig	14-Aug-07	NSRA	Unit 2	Canal	McDonald Canal		Individual	Whole Body	23.2	23.2	
U2W-MC-07-05	Frog, Pig	14-Aug-07	NSRA	Unit 2	Canal	McDonald Canal		Individual	Whole Body	155.19	155.19	
U2W-MC-07-06	Frog, Pig	14-Aug-07	NSRA	Unit 2	Canal	McDonald Canal		Individual	Whole Body	64.15	64.15	
U2W-MC-07-07	Frog, Pig	14-Aug-07	NSRA	Unit 2	Canal	McDonald Canal		Individual	Whole Body	65.87	65.87	
U2W-MC-07-	Frog, Pig	14-Aug-07	NSRA	Unit 2	Canal	McDonald		Individual	Whole	36.14	36.14	

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
08						Canal			Body			
U2W-MC-07-09	Frog, Pig	14-Aug-07	NSRA	Unit 2	Canal	McDonald Canal		Individual	Whole Body	53.09	53.09	
U2W-MC-07-10	Frog, Pig	14-Aug-07	NSRA	Unit 2	Canal	McDonald Canal		Individual	Whole Body	36.31	36.31	
U2W-MC-07-11	Frog, Pig	14-Aug-07	NSRA	Unit 2	Canal	McDonald Canal		Individual	Whole Body	61.55	61.55	
U2W-MC-07-12	Frog, Pig	14-Aug-07	NSRA	Unit 2	Canal	McDonald Canal		Individual	Whole Body	66.58	66.58	
U2W-MC-07-13	Frog, Pig	14-Aug-07	NSRA	Unit 2	Canal	McDonald Canal		Individual	Whole Body	99.02	99.02	
U2W-MC-07-14	Frog, Pig	14-Aug-07	NSRA	Unit 2	Canal	McDonald Canal		Individual	Whole Body	51.52	51.52	
U2W-MC-07-	Frog, Pig	14-Aug-07	NSRA	Unit 2	Canal	McDonald		Individual	Whole	108.34	108.34	

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
15						Canal			Body			
U2W-MC-07-16	Frog, Pig	14-Aug-07	NSRA	Unit 2	Canal	McDonald Canal		Individual	Whole Body	70.103	70.103	
U2W-MC-07-17	Frog, Pig	14-Aug-07	NSRA	Unit 2	Canal	McDonald Canal		Individual	Whole Body	102.37	102.37	
U2W-MC-07-18	Frog, Pig	14-Aug-07	NSRA	Unit 2	Canal	McDonald Canal		Individual	Whole Body	73.88	73.88	
U2W-MC-07-19	Frog, Pig	14-Aug-07	NSRA	Unit 2	Canal	McDonald Canal		Individual	Whole Body	78.16	78.16	
U2W-MC-07-20	Frog, Pig	14-Aug-07	NSRA	Unit 2	Canal	McDonald Canal		Individual	Whole Body	75.79	75.79	
U2W-RC-07-01	Frog, Pig	14-Aug-07	NSRA	Unit 2	Canal	Roach Canal		Individual	Whole Body	12.2	12.2	
WM-G-07-01	Frog, Pig	19-Jun-07	NSRA	West Marsh	G		1	Individual	Whole	186.37	186.37	

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
									Body			
WM-G-07-02	Frog, Pig	19-Jun-07	NSRA	West Marsh	G		1	Individual	Whole Body	180.05	180.05	
WM-G-07-03	Frog, Pig	19-Jun-07	NSRA	West Marsh	G		1	Individual	Whole Body	167.39	167.39	
WM-G-07-04	Frog, Pig	19-Jun-07	NSRA	West Marsh	G		1	Individual	Whole Body	150.26	150.26	
WM-G-07-05	Frog, Pig	19-Jun-07	NSRA	West Marsh	G		1	Individual	Whole Body	108.92	108.92	
WM-G-07-06	Frog, Pig	19-Jun-07	NSRA	West Marsh	G		1	Individual	Whole Body	48.366	48.366	
WM-G-07-07	Frog, Pig	19-Jun-07	NSRA	West Marsh	G		1	Individual	Whole Body	116.05	116.05	
WM-G-07-08	Frog, Pig	19-Jun-07	NSRA	West Marsh	G		1	Individual	Whole	138.59	138.59	

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
									Body			
WM-G-07-09	Frog, Pig	19-Jun-07	NSRA	West Marsh	G		1	Individual	Whole Body	55.961	55.961	
WM-G-07-10	Frog, Pig	19-Jun-07	NSRA	West Marsh	G		1	Individual	Whole Body	69.45	69.45	
WM-G-07-11	Frog, Pig	19-Jun-07	NSRA	West Marsh	G		1	Individual	Whole Body	62.077	62.077	
WM-G-07-12	Frog, Pig	05-Jul-07	NSRA	West Marsh	G		1	Individual	Whole Body	148.16	148.16	
WM-G-07-13	Frog, Pig	05-Jul-07	NSRA	West Marsh	G		1	Individual	Whole Body	70.47	70.47	
WM-G-07-14	Frog, Pig	05-Jul-07	NSRA	West Marsh	G		1	Individual	Whole Body	177.71	177.71	
WM-G-07-15	Frog, Pig	05-Jul-07	NSRA	West Marsh	G		1	Individual	Whole	199.98	199.98	

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
									Body			
WM-G-07-16	Frog, Pig	05-Jul-07	NSRA	West Marsh	G		1	Individual	Whole Body	46.48	46.48	
WM-G-07-17	Frog, Pig	05-Jul-07	NSRA	West Marsh	G		1	Individual	Whole Body	160.05	160.05	
WM-G-07-18	Frog, Pig	05-Jul-07	NSRA	West Marsh	G		1	Individual	Whole Body	94.93	94.93	
WM-G-07-19	Frog, Pig	05-Jul-07	NSRA	West Marsh	G		1	Individual	Whole Body	120.03	120.03	
WM-G-07-20	Frog, Pig	11-Jul-07	NSRA	West Marsh	G		1	Individual	Whole Body	159.29	159.29	
ZNWA PIGFROG1	Frog, Pig	05-Aug-08	NSRA	Phase 1		ZNW-A	3	Composite	Whole Body	45.2	135.6	
ZNWA	Frog, Pig	05-Aug-08	NSRA	Phase 1		ZNW-A	3	Composit	Whole	45.2	135.6	

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
PIGFROG1								e	Body			
ZNWA PIGFROG2	Frog, Pig	05-Aug-08	NSRA	Phase 1		ZNW-A	2	Composit e	Whole Body	68.9	138	
ZNWA PIGFROG2	Frog, Pig	05-Aug-08	NSRA	Phase 1		ZNW-A	2	Composit e	Whole Body	68.9	138	
ZNWB PIGFROG1	Frog, Pig	05-Aug-08	NSRA	Phase 1		ZNW-B	3	Composit e	Whole Body	36.3	109	
ZNWB PIGFROG1	Frog, Pig	05-Aug-08	NSRA	Phase 1		ZNW-B	3	Composit e	Whole Body	36.3	109	
ZNWB PIGFROG2	Frog, Pig	05-Aug-08	NSRA	Phase 1		ZNW-B	2	Composit e	Whole Body	50.9	102	
ZNWC PIGFROG1	Frog, Pig	05-Aug-08	NSRA	Phase 1		ZNW-C	3	Composit e	Whole Body	43.6	130.8	
ZNWC	Frog, Pig	05-Aug-08	NSRA	Phase 1		ZNW-C	3	Composit	Whole	43.6	130.8	

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
PIGFROG1								e	Body			
ZNWC PIGFROG2	Frog, Pig	05-Aug-08	NSRA	Phase 1		ZNW-C	2	Composit e	Whole Body	64.225	128.45	
ZSWA PIGFROG1	Frog, Pig	05-Aug-08	NSRA	Phase 1		ZSW-A	2	Composit e	Whole Body	33.2	66.4	
ZSWA PIGFROG2	Frog, Pig	05-Aug-08	NSRA	Phase 1		ZSW-A	3	Composit e	Whole Body	54.1	162.4	
ZSWA PIGFROG2	Frog, Pig	05-Aug-08	NSRA	Phase 1		ZSW-A	3	Composit e	Whole Body	54.1	162.4	
ZSWA PIGFROG3	Frog, Pig	05-Aug-08	NSRA	Phase 1		ZSW-A	3	Composit e	Whole Body	24.9	74.8	
ZSWA PIGFROG3	Frog, Pig	05-Aug-08	NSRA	Phase 1		ZSW-A	3	Composit e	Whole Body	24.9	74.8	
ZSWC	Frog, Pig	05-Aug-08	NSRA	Phase 1		ZSW-C	2	Composit	Whole	51.4	103	

Field ID	Species	Collection Date	Collection Area 1	Collection Area 2	Collection Area 3	Collection Area 4	Number Collected	Matrix	Tissue Type	Individual Weight (g)	Sample Weight (g)	Length (mm)
PIGFROG1								e	Body			
ZSWC PIGFROG2	Frog, Pig	05-Aug-08	NSRA	Phase 1		ZSW-C	2	Composit e	Whole Body	41	82	
ZSWC PIGFROG3	Frog, Pig	05-Aug-08	NSRA	Phase 1		ZSW-C	2	Composit e	Whole Body	51	101	

APPENDIX G
OCP ANALYSIS DATA

Appendix G-1: Analysis data for OCP sample collections from Lake Apopka and the NSRA in 2007. Results from OCP analysis showing lipid content, DDD, DDE, DDT, DDTr, DDTx, Aldrin, alpha-BHC, and alpha-Chlordane. DDTr represents DDT equivalents and is the sum of DDT+(DDD/5)+(DDE/15). DDTx is the sum of DDT+DDD+DDE. Comment codes are defined at the end of this appendix.

Field ID	Lipid (%)	4,4'-DDD (ug/kg)	4,4'-DDE (ug/kg)	4,4'-DDT (ug/kg)	4,4'-DDTr (ug/kg)	4,4'-DDTx (ug/kg)	Aldrin (ug/kg)	alpha-BHC (ug/kg)	alpha-Chlordane (ug/kg)
31203-FT	68.1	30 U	29000	24 UJNP	1963 UUJNP	29054 UUJNP	22 U	25 U	220
31203-SC	0.19	9.1 U	24 I	7.1 U	10.52 UIU	40.2 UIU	6.7 U	7.5 UJNP	5 U
31206-FT	48.6	120 UP	58000	97 UJNP	3988 UPUJNP	58217 UPUJNP	91 U	100 U	68 U
31206-SC	0.49	9.7 U	38 I	7.5 U	11.97 UIU	55.2 UIU	7.1 U	7.9 UJNP	5.3 U
31224-BL	0.15	0.94 UJNP	59	0.73 UJNP	4.85 UJNPUJNP	60.67 UJNPUJNP	0.69 UJNP	5.2 JNV	0.51 U
31224-FT	75.6	240	58000	25 UJNP	3940 UJNP	58265 UJNP	23 UJNP	26 UJNP	55 I
31224-LV	2.67	13 JNP	970	6.7 JNP	73.96 JNPJNP	989.7 JNPJNP	3.6 JNP	5.1 JNPV	2.8 I
31224-MS	0.33	1.2 U	180	0.97 U	13.21 UU	182.17 UU	0.92 UJNP	1.6 IJNPV	1.5 IP
31224-SC	0.87	6.6 UJNP	550	5.1 UJNP	43.1 UJNPUJNP	561.7 UJNPUJNP	4.8 U	8.2 IJNPV	8.8 I
31225-BL	0.15	2.9	130	0.38 UJNP	9.63 UJNP	133.28 UJNP	0.36 UJNP	2.8 JNPV	1.7

Field ID	Lipid (%)	4,4'-DDD (ug/kg)	4,4'-DDE (ug/kg)	4,4'-DDT (ug/kg)	4,4'-DDTr (ug/kg)	4,4'-DDTx (ug/kg)	Aldrin (ug/kg)	alpha-BHC (ug/kg)	alpha-Chlordane (ug/kg)
31225-FT	49.2	1900	78000	64 UJNP	5644 UJNP	79964 UJNP	61 UJNP	67 UJNP	1000
31225-LV	2.8	97	3300	3.2 UJNP	242.6 UJNP	3400.2 UJNP	3.1 UJNP	6.7 IJNV	36
31225-MS	0.84	26	1000	1.1 UJNP	72.96 UJNP	1027.1 UJNP	1.1 UJN	1.2 UJNP	14
31225-SC	2.22	44 I	2700	8.5 UJNP	197.3 IUJNP	2752.5 IUJNP	8.1 U	25 IJNPV	46
31225-ST	3.49	130 I	810	1.2 U	81.2 IU	941.2 IU	1.1 U	1.2 U	7
31297-FT	80.4	250	1300	120	256	1670	2.7 UJNP	3 UJNP	2 U
31297-SC	0.73	24 U	31 UP	19 U	25.87 UUPU	74 UUPU	18 U	20 UJNP	13 U
31298-FT	80.7	1.8 IJNP	1100	2.7 I	76.4 IJNPI	1104.5 IJNPI	1.4 IJN	1.4 U	2.4 I
31298-SC	0.54	7.6 U	9.8 UP	6 U	8.17 UUPU	23.4 UUPU	5.6 U	6.3 UJNP	4.2 U
31299-BL	0.11	0.49 U	20	0.38 UJNP	1.81 UUJNP	20.87 UUJNP	0.36 UJNP	3 JNV	0.56 IP
31299-FT	77.5	360	26000	67 IJNP	1872 IJNP	26427 IJNP	16 IJN	16 UJNP	420
31299-LV	4.08	18 JNP	1000	19	89.2 JNP	1037 JNP	2.1 IJNP	16 JNPV	15

Field ID	Lipid (%)	4,4'-DDD (ug/kg)	4,4'-DDE (ug/kg)	4,4'-DDT (ug/kg)	4,4'-DDTr (ug/kg)	4,4'-DDTx (ug/kg)	Aldrin (ug/kg)	alpha-BHC (ug/kg)	alpha-Chlordane (ug/kg)
31299-MS	5.44	25	1800	4.4 IJNP	129.4 IJNP	1829 IJNP	1.8 UJNP	2 UJNP	29
31299-SC	0.31	7.6 U	43	5.9 U	10.28 UU	56.5 UU	5.6 U	9.7 IJNPV	4.7 I
31300-BL	0.16	0.58 UJNP	30	0.45 UJNP	2.56 UJNPUJNP	31.03 UJNPUJNP	0.43 U	3.8 JN	0.52 I
31300-FT	43.8	150	25000	56 IJNP	1752 IJNP	25206 IJNP	15 IJNP	13 UJNP	250
31300-LV	0.99	1.1 UJNP	260	0.87 IJNP	18.42 UJNPIJNP	261.97 UJNPIJNP	0.83 U	0.92 UJ	1.2 I
31300-MS	0.17	0.96 UJNP	52	0.75 UJNP	4.41 UJNPUJNP	53.71 UJNPUJNP	0.71 UJN	0.79 UJNP	0.86 I
31300-SC	1.4	20 U	190	15 U	31.6 UU	225 UU	15 U	18 IJNP	11 U
37177-BL	0.19	0.49 U	13	0.38 UJNP	1.34 UUJNP	13.87 UUJNP	0.36 U	3.3 JN	0.27 U
37177-FT	0.7	4.9 U	37	3.8 U	7.24 UU	45.7 UU	3.6 UJNP	4 UJNP	2.7 U
37177-LV	1.71	1.1 U	150	0.84 UJNP	11.06 UUJNP	151.94 UUJNP	0.8 UJNP	0.89 UJ	0.59 U
37177-MS	0.76	1.3 UJNP	110	0.99 UJNP	8.58 UJNPUJNP	112.29 UJNPUJNP	0.93 UJNP	1 UJNP	0.69 U

Field ID	Lipid (%)	4,4'-DDD (ug/kg)	4,4'-DDE (ug/kg)	4,4'-DDT (ug/kg)	4,4'-DDTr (ug/kg)	4,4'-DDTx (ug/kg)	Aldrin (ug/kg)	alpha-BHC (ug/kg)	alpha-Chlordane (ug/kg)
37177-SC	1.75	25 U	32 U	19 U	26.13 UUU	76 UUU	18 UJNP	20 UJNP	13 U
37194-BL	0.17	0.49 U	13	0.38 UJNP	1.34 UUJNP	13.87 UUJNP	0.36 UJN	2.7 JNP	0.27 U
37194-FT	47.5	16 UJNP	8100	30 I	573.2 UJNPI	8146 UJNPI	12 UJNP	13 UJ	9 U
37194-LV	1.28	1.1 U	91	1.2 IJNP	7.49 UIJNP	93.3 UIJNP	0.79 U	0.88 UJ	0.77 I
37194-MS	0.23	1.2 U	16	0.96 UJNP	2.26 UUJNP	18.16 UUJNP	0.91 U	1 UJNP	0.67 U
37194-SC	2	33 U	42 U	26 U	35.4 UUU	101 UUU	24 U	27 UJNP	18 U
AP-07-108	18.6	11	510	2.8 IJNP	39 IJNP	523.8 IJNP	1.1 U	1.2 UJNP	4
AP-07-109 A	16.3	11	2100	6 IJNP	148.2 IJNP	2117 IJNP	1.6 U	1.8 U	6.9
AP-07-109 B	10.4	5.9 I	730	3.2 IJNP	53.04 IIJNP	739.1 IIJNP	0.98 U	1.1 UJNP	3.1 I
AP-07-110	15	13	710	3.6 IJNP	53.53 IJNP	726.6 IJNP	0.8 U	0.89 UJNP	3.9
AP-07-111	20.1	7.8 UJNP	6800	6.8 IJNP	462 UJNPIJNP	6814.6 UJNPIJNP	5.8 U	6.4 U	24
AP-07-112	18.4	19	1400	5.8 IJNP	102.9 IJNP	1424.8 IJNP	0.96 U	1.1 UJNP	4.6

Field ID	Lipid (%)	4,4'-DDD (ug/kg)	4,4'-DDE (ug/kg)	4,4'-DDT (ug/kg)	4,4'-DDTr (ug/kg)	4,4'-DDTx (ug/kg)	Aldrin (ug/kg)	alpha-BHC (ug/kg)	alpha-Chlordane (ug/kg)
AP-07-113	18.3	23 U	22000	22 IJNP	1493 UIJNP	22045 UIJNP	17 U	19 UJNP	74
AP-07-114	20	15 IJNP	4300	16 IJNP	305 IJNPIJNP	4331 IJNPIJNP	5.3 U	6 UJNP	29
AP-07-201	13.4	9.3 IJ	2100	11 IJNP	152.86 IJIJNP	2120.3 IJIJNP	3.6 UJNP	4 UJNP	14
AP-07-202	19.4	14 UJ	8300	33 IJNP	589 UJIJNP	8347 UJIJNP	10 UJN	11 U	36
AP-07-203	17.9	13 J	630	3.7 IJNP	48.3 JIJNP	646.7 JIJNP	1.4 UJNP	1.6 UJNP	7.3
AP-07-204	17.3	9.7 J	400	2.7 IJNP	31.3 JIJNP	412.4 JIJNP	1.2 UJNP	1.4 UJNP	3.7 I
AP-07-301	10.9	12 J	1200	3.5 IJNP	85.9 JIJNP	1215.5 JIJNP	1.1 U	1.2 UJNP	6.3
AP-07-303	19.4	34 J	1600	12 JNP	125.4 JJNP	1646 JJNP	1.5 U	1.6 UJNP	23
AP-07-304	20.9	13 UJNP	6400	10 U	439 UJNPU	6423 UJNPU	9.5 U	11 UJNP	31 I
AP-07-306	15.5	7.1 IJNP	3400	4.2 IJNP	232 IJNPIJNP	3411.3 IJNPIJNP	3.6 U	4 UJNP	19
AP-07-307	15.7	31 UJNP	18000	59 IJNP	1265.2 UJNPIJNP	18090 UJNPIJNP	23 UJNP	26 U	100

Field ID	Lipid (%)	4,4'-DDD (ug/kg)	4,4'-DDE (ug/kg)	4,4'-DDT (ug/kg)	4,4'-DDTr (ug/kg)	4,4'-DDTx (ug/kg)	Aldrin (ug/kg)	alpha-BHC (ug/kg)	alpha-Chlordane (ug/kg)
AP-07-308	18.1	24 UJNP	16000	18 U	1089 UJNPU	16042 UJNPU	17 U	19 UJNP	120
AP-07-309	17.2	20 U	23000	15 UJNP	1552 UUJNP	23035 UUJNP	15 UJNP	16 UJNP	91
AP-07-310	18.7	5.5 UJNP	3800	5 I	259 UJNPI	3810.5 UJNPI	4.1 UJNP	4.5 UJNP	29
AP-07-311	16.9	8	730	2.7 IJNP	52.96 IJNP	740.7 IJNP	0.88 U	0.98 UJNP	2.7 I
AP-07-312	18.3	37 IJNP	12000	19 UJNP	826.4 IJNPUJNP	12056 IJNPUJNP	18 U	20 U	93
AP-07-313	19.5	50 IJNP	29000	73 IJNP	2016 IJNPIJNP	29123 IJNPIJNP	26 U	29 U	140
AP-07-401	13.6	14 IJNP	5600	48 IJNP	242 IJNPIJNP	5662 IJNPIJNP	9.6 UJN	11 UJNP	18 I
AP-07-402	18.9	11 IP	1900	9.4 IJNP	138 IPIJNP	1920.4 IPIJNP	1.7 UJN	1.9 UJNP	16
AP-07-403	18.9	7.3 U	2100	9.7 IJNP	151.16 UIJNP	2117 UIJNP	5.4 UJN	6 UJNP	19
AP-07-404	17.8	11	620	4.8 IJNP	48.3 IJNP	635.8 IJNP	0.98 UJNP	1.1 UJNP	5.1
AP-07-405	16.9	34 UJNP	29000	100 IJNP	2040 UJNPIJNP	29134 UJNPIJNP	25 UJNP	28 U	78 I
AP-07-406	12.6	5.9 IJN	560	3.2 IJNP	41.7 IJNIJNP	569.1 IJNIJNP	1.9 UJNP	2.1 UJNP	4.6 I

Field ID	Lipid (%)	4,4'-DDD (ug/kg)	4,4'-DDE (ug/kg)	4,4'-DDT (ug/kg)	4,4'-DDTr (ug/kg)	4,4'-DDTx (ug/kg)	Aldrin (ug/kg)	alpha-BHC (ug/kg)	alpha-Chlordane (ug/kg)
AP-07-408	17.6	7.9 I	2100	6.3 IJNP	147.88 IIJNP	2114.2 IIJNP	3.7 UJN	4.1 UJNP	11 I
ARA-07-10	15.2	710	12000	9.9 U	951.9 U	12719.9 U	13 IJN	10 U	270
ARA-07-101	18.6	350 J	15000	15 U	1085 JU	15365 JU	15 UJNP	16 U	350
ARA-07-102	18.9	470 J	15000	20 UJNP	1114 JUJNP	15490 JUJNP	19 UJN	21 U	420
ARA-07-103	16	420 J	12000	19 UJNP	903 JUJNP	12439 JUJNP	18 UJNP	20 U	280
ARA-07-104	19.5	340 J	8800	6.8 U	661 JU	9146.8 JU	6.9 IJNP	7.2 U	220
ARA-07-105	20.9	380 J	26000	20 UP	1829 JUP	26400 JUP	19 UJNP	21 U	420
ARA-07-106	21	460 J	21000	19 U	1511 JU	21479 JU	18 UJNP	20 U	320
ARA-07-107	18.2	400 J	14000	24 UJNP	1037 JUJNP	14424 JUJNP	23 UJNP	25 U	270
ARA-07-115	15.6	11 IJNP	3500	7.6 IJNP	243 IJNPIJNP	3518.6 IJNPIJNP	3.9 U	4.3 U	11 I
ARA-07-116	19.2	18 IJNP	4000	8 IJNP	278 IJNPIJNP	4026 IJNPIJNP	5.2 U	5.8 U	7.1 I
ARA-07-117	18.7	25	730	3.2 IJNP	56.8 IJNP	758.2 IJNP	0.97 U	1.1 UJNP	6.9

Field ID	Lipid (%)	4,4'-DDD (ug/kg)	4,4'-DDE (ug/kg)	4,4'-DDT (ug/kg)	4,4'-DDTr (ug/kg)	4,4'-DDTx (ug/kg)	Aldrin (ug/kg)	alpha-BHC (ug/kg)	alpha-Chlordane (ug/kg)
ARA-07-118	19.7	25 U	32000	76 IJNP	2214 UIJNP	32101 UIJNP	18 U	20 U	130
ARA-07-119	16.9	25	1800	3.9 IJNP	128.9 IJNP	1828.9 IJNP	0.98 U	1.1 U	36
ARA-07-120	13.4	520 P	61000	160 I	4331 PI	61680 PI	65 UJN	72 U	660
ARA-07-123	12.8	10 U	2900	11 IJNP	206 UIJNP	2921 UIJNP	7.5 UJN	8.4 UJNP	16 I
ARA-07-124	18.5	3.9 I	1700	2.7 IJNP	116.8 IIJNP	1706.6 IIJNP	1.2 UJN	1.3 UJNP	17
ARA-07-125	13.2	2 IJNP	420	0.87 UJNP	29.27 IJNPUJNP	422.87 IJNPUJNP	0.83 UJNP	0.92 UJNP	4.6
ARA-07-126	11.4	15 UJNP	8800	11 UJNP	600 UJNPUJNP	8826 UJNPUJNP	11 UJNP	12 U	14 I
ARA-07-127	17.1	16 U	6400	12 UJNP	441.8 UUJNP	6428 UUJNP	11 U	13 UJN	8.7 I
ARA-07-128	15.7	12 U	12000	9.7 UJNP	812.1 UUJNP	12021.7 UUJNP	9.2 UJNP	10 U	17 I
ARA-07-302	16.2	28 IJNP	10000	12 IJNP	684 IJNPIJNP	10040 IJNPIJNP	10 UJNP	11 U	33 I
ARA-07-407	17.6	210	4000	14 UJNP	322 UJNP	4224 UJNP	13 UJNP	15 UJNP	140
ARA-07-409	12.7	240	5800	14 UJNP	448.6 UJNP	6054 UJNP	13 UJNP	15 UJNP	110

Field ID	Lipid (%)	4,4'-DDD (ug/kg)	4,4'-DDE (ug/kg)	4,4'-DDT (ug/kg)	4,4'-DDTr (ug/kg)	4,4'-DDTx (ug/kg)	Aldrin (ug/kg)	alpha-BHC (ug/kg)	alpha-Chlordane (ug/kg)
ARA-07-410	16.9	150	3200	5 UJNP	248 UJNP	3355 UJNP	4.7 UJNP	5.3 UJNP	61
ARA-07-550	14.2	13 U	19000	18 I	1287 UI	19031 UI	9.6 UJNP	11 UJNP	67
ARA-07-601	0.5	1.7 U	69	1.4 U	6.34 UU	72.1 UU	1.3 U	1.4 UJNP	0.95 U
ARA-07-602	20.6	2.2 UJNP	820	1.7 U	56.8 UJNPU	823.9 UJNPU	1.7 UJN	1.8 UJNP	8.2
ARA-07-603	15.4	2.8 UJNP	1700	2.2 U	116 UJNPU	1705 UJNPU	2.1 UJNP	2.3 U	1.6 I
ARA-07-8	15.8	5 IJNP	4000	4.6 I	272 IJNPI	4009.6 IJNPI	2.4 UJNP	2.7 U	12
ARA-07-9	16.9	270	7100	5.1 UJNP	532 UJNP	7375.1 UJNP	4.8 UJNP	5.4 U	140
DU-NWC-07-06	1.86	0.49 UJNP	37	0.38 U	2.94 UJNPU	37.87 UJNPU	0.36 UJN	0.43 IJNP	0.27 U
DU-NWC-07-07	2.62	0.49 UJNP	23	0.38 UJNP	2.01 UJNPUJNP	23.87 UJNPUJNP	0.88 IJN	0.4 UJNP	0.27 UJNP
DU-NWC-07-08	1.3	0.62 IJNP	30	0.38 UJNP	2.5 IJNPUJNP	31 IJNPUJNP	0.72 IJNP	0.4 UJNP	0.27 U
DU-NWC-07-09	0.11	0.49 UJNP	16	0.38 UJNP	1.54 UJNPUJNP	16.87 UJNPUJNP	0.36 U	0.68 IJNP	0.6 I
DU-NWC-07-10	1.48	0.49 UJNP	34	0.38 UJNP	2.74 UJNPUJNP	34.87 UJNPUJNP	0.65 IJNP	0.78 IJNP	0.27 UP

Field ID	Lipid (%)	4,4'-DDD (ug/kg)	4,4'-DDE (ug/kg)	4,4'-DDT (ug/kg)	4,4'-DDTr (ug/kg)	4,4'-DDTx (ug/kg)	Aldrin (ug/kg)	alpha-BHC (ug/kg)	alpha-Chlordane (ug/kg)
DU-NWC-07-11	1.51	0.49 UJNP	10	0.38 UJNP	1.14 UJNPUJNP	10.87 UJNPUJNP	0.53 IJNP	0.42 IJNP	0.27 U
DU-NWC-07-12	2	0.49 UJNP	31	0.38 UJNP	2.54 UJNPUJNP	31.87 UJNPUJNP	0.36 U	0.4 UJNP	0.98 I
DU-NWC-07-13	0.46	0.49 U	2.9 P	0.38 UJNP	0.67 UPUJNP	3.77 UPUJNP	0.86 IJN	0.4 UJNP	0.27 U
DU-NWC-07-14	1.16	1.1 IJNP	26	0.38 UJNP	2.3 IJNPUJNP	27.48 IJNPUJNP	0.36 U	2.6 JNP	0.55 I
DU-NWC-07-15	1.18	0.49 UJNP	36	0.51 I	3 UJNPI	37 UJNPI	0.46 IJNP	0.4 UJNP	0.6 I
DU-NWC-07-16	1.34	0.49 UJNP	39	0.38 UJNP	3.08 UJNPUJNP	39.87 UJNPUJNP	0.36 U	0.4 UJNP	0.63 IP
DU-NWC-07-17	1.39	0.49 UJNP	12	0.38 UJNP	1.278 UJNPUJNP	12.87 UJNPUJNP	0.89 IJNP	0.41 IJNP	1.2 IJ
DU-NWC-07-18	1.16	0.99 UJNP	18	0.77 U	2.17 UJNPU	19.76 UJNPU	0.73 U	1.7 IJNP	0.54 UP
DU-NWC-07-19	1.48	1 IJNP	26	0.77 U	2.7 IJNPU	27.77 IJNPU	0.73 UJ	0.81 U	1.9 I
DU-NWC-07-20	2.18	0.99 UJNP	29	0.77 U	2.9 UJNPU	30.76 UJNPU	0.73 UJNP	0.81 U	0.54 U
DU-SEA-07-02	0.35	0.49 UJNP	2.7	0.56 IJNP	0.84 UJNPIJNP	3.75 UJNPIJNP	0.36 U	0.4 UJNP	0.27 UP

Field ID	Lipid (%)	4,4'-DDD (ug/kg)	4,4'-DDE (ug/kg)	4,4'-DDT (ug/kg)	4,4'-DDTr (ug/kg)	4,4'-DDTx (ug/kg)	Aldrin (ug/kg)	alpha-BHC (ug/kg)	alpha-Chlordane (ug/kg)
DU-SEA-07-03	1.24	0.49 UJNP	5.2	0.42 IJNP	0.86 UJNPIJNP	6.11 UJNPIJNP	0.36 U	0.98 IJNP	0.27 U
DU-SEA-07-04	0.61	0.64 UJNP	3.6	0.5 UJNP	0.87 UJNPUJNP	4.74 UJNPUJNP	0.47 UJNP	1.3 IJNP	0.35 U
DU-SEC-07-05	0.48	0.49 U	23	0.48 I	2.11 UI	23.97 UI	1.8 JN	0.82 IJNP	0.46 I
DU-SWC-07-01	1.23	2.4 IJNP	72	0.77 UJN	6.05 IJNPUJN	75.17 IJNPUJN	0.73 U	0.81 UJNP	0.63 IP
FWC13425H	1.6	2.8 IJNP	3210	2.2 UJNP	216.76 IJNPUJNP	3215 IJNPUJNP	2.1 U	2.3 U	1.9 I
FWC13564H	1.1	2 I	68.6	0.51 IJNP	5.48 IIJNP	71.11 IIJNP	0.36 U	0.4 U	0.84 I
FWC13671H	1.5	0.5 U	81.9	0.97 I	6.53 UI	83.37 UI	0.36 U	0.4 U	0.54 I
FWC13810H	1.2	4.9 JNP	693	1.3 I	48.48 JNPI	699.2 JNPI	0.36 U	0.4 U	1 I
FWC13860H	1.8	0.71 U	64.9 I	0.55 U	5.02 UIU	66.16 UIU	1.3 IJN	0.58 U	0.76 I
FWC14584H	0.94	6.9	1700	0.88 IJNP	115.6 IJNP	1707 IJNP	0.59 U	0.65 UJNP	0.63 I
FWC14616H	1.8	1.3 U	53.5	1 UJNP	4.82 UUJNP	55.8 UUJNP	0.97 UJNP	1.1 U	0.72 U

Field ID	Lipid (%)	4,4'-DDD (ug/kg)	4,4'-DDE (ug/kg)	4,4'-DDT (ug/kg)	4,4'-DDTr (ug/kg)	4,4'-DDTx (ug/kg)	Aldrin (ug/kg)	alpha-BHC (ug/kg)	alpha-Chlordane (ug/kg)
FWC14752H	1.4	1.1 IJNP	69.8	0.38 U	5.25 IJNPU	71.28 IJNPU	0.36 U	0.4 UJNP	0.55 I
FWC15173H	1.3	2 IJNP	1940	2 IJNP	131.7 IJNPIJNP	1944 IJNPIJNP	0.87 U	0.96 U	1.2 I
FWC15212H	2.2	7	729	2.5	52.5	738.5	0.36 U	0.4 U	1.7
FWC15260H	1.2	4.3 IJNP	2820	1.9 UJNP	190.76 IJNPUJNP	2826.2 IJNPUJNP	1.8 U	2 U	1.5 I
FWC15388H	1	0.78 IJNP	120	0.38 UJNP	8.536 IJNPUJNP	121.16 IJNPUJNP	0.36 U	0.4 U	0.5 I
FWC15475H	1.4	0.77 UJNP	310	2.1 I	22.92 UJNPI	312.87 UJNPI	0.57 U	0.63 U	0.61 I
FWC15602H	1.7	0.5 IJNP	508	0.62 IJNP	34.6 IJNPIJNP	509 IJNPIJNP	0.36 U	0.4 U	0.77 I
FWC15615H	1.7	1.3 IJNP	318	0.69 IJNP	22.15 IJNPIJNP	319.99 IJNPIJNP	0.36 U	0.4 U	0.57 I
FWC15731H	1.4	1.5 IJNP	439	1.2 I	30.7 IJNPI	441.7 IJNPI	0.78 IJN	0.4 UJNP	0.8 I
FWC15736H	1.2	1.9 IJNP	277	0.51 UJNP	19.36 IJNPUJNP	279.41 IJNPUJNP	0.68 IJNP	0.54 U	0.49 I
FWC31201-WM-090408	0.1	1.5 U	62.7	1.1 U	5.58 UU	65.3 UU	1.8 UJN	2.3 IJNP	0.87 U

Field ID	Lipid (%)	4,4'-DDD (ug/kg)	4,4'-DDE (ug/kg)	4,4'-DDT (ug/kg)	4,4'-DDTr (ug/kg)	4,4'-DDTx (ug/kg)	Aldrin (ug/kg)	alpha-BHC (ug/kg)	alpha-Chlordane (ug/kg)
FWC31214-LK-090408	0.1 U	1.4 UJNP	4.1 I	1 UJN	1.55 UJNPIUJN	6.5 UJNPIUJN	1.6 UJNP	1.9 IJNP	0.8 U
FWC31215-WM-091708	0.1 U	1.5 UJNP	65.3	1.2 UJN	5.85 UJNPUJN	68 UJNPUJN	1.8 UJNP	2.2 IJNP	0.9 U
FWC31216-LK-090408	0.1 U	1.1 UJNP	74.1	0.85 UJN	6.01 UJNPUJN	76.05 UJNPUJN	1.3 UJN	1.5 IJNP	0.65 U
FWC31217-WM-090408	0.1 U	1.5 UJNP	36.4	1.1 UJN	3.83 UJNPUJN	39 UJNPUJN	1.8 UJNP	2.3 IJN	0.87 U
FWC31803B	0.1	0.97 UJNP	55	0.76 UJNP	4.62 UJNPUJNP	56.73 UJNPUJNP	0.72 UJNP	0.8 U	0.53 U
FWC31803B	0.1 U	1.4 UJNP	62	1.1 U	5.89 UJNPUJNP	65.2 UJNPUJNP	1 UJNP	1.1 UJNP	0.74 U
FWC31803B	0.1 U	1.7 UJNP	74	1.3 UJNP	6.57 UJNPUJNP	77 UJNPUJNP	1.2 U	1.5 UJNP	0.9 U
FWC31803B	0.15	1.8 UJNP	94	1.4 UJNP	7.64 UJNPU	96.5 UJNPU	1.3 UJNP	2.3 IJNP	0.97 U
FWC31803F	35.7	136 IJNP	102000	30.9 UJNP	6858.1 IJNPUJNP	102166.9 IJNPUJNP	29.3 UJNP	32.5 UJNP	21.7 U
FWC31803L	3.6	14.4 I	5840	4.6 U	396 IU	5859 IU	4.4 IJN	4.8 U	4.6 I
FWC31809B	0.1 U	0.75 UJNP	3.8 I	0.58 U	1.17 UIUJNP	5.49 UJNPIUJNP	0.55 UJNP	0.61 UJNP	0.41 U

Field ID	Lipid (%)	4,4'-DDD (ug/kg)	4,4'-DDE (ug/kg)	4,4'-DDT (ug/kg)	4,4'-DDTr (ug/kg)	4,4'-DDTx (ug/kg)	Aldrin (ug/kg)	alpha-BHC (ug/kg)	alpha-Chlordane (ug/kg)
FWC31809B	0.12	0.93 U	4 I	0.72 UJNP	1.18 UJNPIUJNP	5.65 UIUJNP	0.68 UJN	0.76 UJNP	0.51 U
FWC31809B	0.13	0.95 UJNP	4.3 I	0.74 UJNP	1.19 UJNPU	6.11 UIUJNP	0.7 UJNP	0.78 UJNP	0.52 U
FWC31809B	0.2	1 U	6.9	0.81 UJNP	1.3 UIUJNP	8.23 UJNPU	0.77 UJNP	0.85 UJNP	0.57 U
FWC31809F	55.3	46.7	6330	13.9 IJNP	445.24 IJNP	6390.6 IJNP	4.1 U	4.6 UJNP	13.6 I
FWC31809L	3	0.5 UJNP	93.8	1.4 I	7.75 UJNPI	95.7 UJNPI	0.36 UJNP	0.4 U	0.4 I
FWC31811B	0.12	0.88 UJNP	166	0.68 UJNP	11.9 UJNPUJNP	167.56 UJNPUJNP	0.65 UJN	0.72 U	0.48 U
FWC31811B	0.13	1.2 UJNP	176	0.91 UJNP	12.88 UJNPUJNP	178.11 UJNPUJNP	0.86 UJN	0.96 UJNP	0.64 U
FWC31811B	0.17	1.4 UJNP	186	1 UJNP	14 IUJNP	190 IUJNP	0.96 UJNP	1.1 UJNP	0.76 I
FWC31811B	0.26	3 I	215	1.1 UJNP	15.71 UJNPUJNP	217.5 UJNPUJNP	1.1 UJNP	1.2 UJNP	0.78 U

Field ID	Lipid (%)	4,4'-DDD (ug/kg)	4,4'-DDE (ug/kg)	4,4'-DDT (ug/kg)	4,4'-DDTr (ug/kg)	4,4'-DDTx (ug/kg)	Aldrin (ug/kg)	alpha-BHC (ug/kg)	alpha-Chlordane (ug/kg)
FWC31811F	17.2	789 JNP	269000	443	18534 JNP	270232 JNP	56.2 U	62.3 U	322
FWC31811L	2.7	19.3 IJNP	7110	21.4 I	499 IJNPI	7150.7 IJNPI	3.8 IJN	4 U	9.6 I
FWC31813B	0.1 U	0.98 UJNP	6.2 I	0.76 UJNP	1.61 UJNPUJNP	8.7 UIUJNP	0.72 UJNP	0.8 U	0.53 U
FWC31813B	0.1 U	1.3 UJNP	6.5 I	1 U	1.79 UIUJNP	9 UIUJNP	0.98 U	1.1 U	0.72 U
FWC31813B	0.21	1.4 U	8.8	1.1 UJNP	1.81 UIUJNP	11.1 UJNPU	1 UJNP	1.1 UJNP	0.74 U
FWC31813B	0.23	1.4 U	9.8	1.1 UJNP	1.84 UJNPU	11.54 UJNPUJNP	1 UJNP	1.1 UJNP	0.75 U
FWC31813F	37.8	21.1 IJNP	8260	8.4 U	563 IJNPU	8289.5 IJNPU	8 UJNP	8.9 U	18.2 I
FWC31813L	1.9	0.96 U	158	0.75 U	11.48 UU	159.71 UU	0.98 IJNP	0.78 U	2.2 I
FWC31822-U2W-040809	0.1 U	1.1 UJNP	9.6	0.81 UJN	1.67 UJNPUJN	11.51 UJNPUJN	1.3 UJNP	2 IJNP	0.62 U
FWC31828B	0.1 U	0.9 UJNP	49.8	0.7 UJNP	4.52 UUJNP	51.96 UUJNP	0.66 UJNP	0.73 UJNP	0.49 U
FWC31828B	0.1 U	1.1 U	56	0.89 UJNP	4.84 UUJNP	57.99 UUJNP	0.84 UJNP	0.98 UJNP	0.62 U

Field ID	Lipid (%)	4,4'-DDD (ug/kg)	4,4'-DDE (ug/kg)	4,4'-DDT (ug/kg)	4,4'-DDTr (ug/kg)	4,4'-DDTx (ug/kg)	Aldrin (ug/kg)	alpha-BHC (ug/kg)	alpha-Chlordane (ug/kg)
FWC31828B	0.11	1.2 U	58	0.93 UJNP	5.03 UUJNP	60.13 UUJNP	0.88 U	1 UJNP	0.65 U
FWC31828B	0.14	1.2 U	66.3	0.96 UJNP	5.3 UJNPUJNP	67.9 UJNPUJNP	0.91 UJNP	1.5 IJNP	0.67 U
FWC31828F	29.8	38.4 UJNP	76700	42.4 I	5163 UJNPI	76780.8 UJNPI	28.3 U	31.4 UJNP	20.9 U
FWC31828L	2.4	2 U	2280	9 IJNP	161.4 UIJNP	2291 UIJNP	1.5 UJN	1.6 UJNP	2.7 I
FWC31831B	0.1 U	0.87 UJNP	12.3	0.68 UJNP	1.764 UU	14.02 UU	0.64 U	0.72 U	0.48 U
FWC31831B	0.1 U	0.96 UJNP	14.6	0.75 U	1.93 UJNPU	16.33 UJNPU	0.71 UJN	0.79 U	0.52 U
FWC31831B	0.1 U	0.97 UJNP	16.6	0.75 U	2.05 UJNPU	18.31 UJNPU	0.71 U	0.79 U	0.53 U
FWC31831B	0.1 U	0.97 U	22.9	0.76 U	2.4 UJNPUJNP	24.45 UJNPUJNP	0.72 UJN	0.8 U	0.53 U
FWC31831F	31	31 UJNP	24600	38.7 IJNP	1684.9 UJNPIJNP	24669.7 UJNPIJNP	22.9 UJNP	25.4 UJN	20.4 I
FWC31831L	2.4	0.99 U	297 J	0.77 UJ	20.768 UJUJ	298.76 UJUJ	0.73 UJ	0.81 UJ	2.1 IJ
FWC31832B	0.1 U	0.94 UJNP	4.3 I	0.73 UJNP	1.25	6.06 UJNPIUJNP	0.7 U	0.77 U	0.51 U

Field ID	Lipid (%)	4,4'-DDD (ug/kg)	4,4'-DDE (ug/kg)	4,4'-DDT (ug/kg)	4,4'-DDTr (ug/kg)	4,4'-DDTx (ug/kg)	Aldrin (ug/kg)	alpha-BHC (ug/kg)	alpha-Chlordane (ug/kg)
					UJNPIUJNP				
FWC31832B	0.1 U	0.99 UJNP	5.6	0.77 UJNP	1.29 UJNPUJNP	7.27 UJNPUJNP	0.73 U	0.81 UJNP	0.54 U
FWC31832B	0.1 U	1 UJNP	5.6	0.78 U	1.35 UJNPU	7.38 UJNPU	0.74 U	0.82 U	0.55 U
FWC31832B	0.15	7.6 U	11.4 IJNP	5.9 U	8.18 UIJNPU	24.9 UIJNPU	5.6 UJNP	6.3 IJNP	4.1 UJNP
FWC31832F	55.8	14.8 IJNP	4150	3 I	282 IJNPI	4167.8 IJNPI	3.8 IJNP	2.6 U	8.3
FWC31832L	3.2	2 U	140 J	18.5	28.33 UJ	160.5 UJ	3 IJ, JN	1.6 UJ, JNP	3.5 IJ
FWC31835B	0.1 U	2 U	10.6 I	1.5 UJNP	3.35 UIU	15.4 UIU	1.4 UJNP	1.6 U	1.1 U
FWC31835B	0.1 U	2.1 U	31.1	1.6 U	3.97 UUJNP	34.6 UUJNP	1.6 U	1.7 U	1.3 U
FWC31835B	0.12	2.4 UJN	48.4	1.8 UJNP	5.5 UJNUJNP	52.6 UJNUJNP	1.7 UJNP	1.9 U	1.4 I
FWC31835B	0.17	2.7 U	74.7	2.1 U	7 UU	78.4 UU	2 UJNP	2.2 U	1.5 UJNP
FWC31835F	41.7	49.6 JNP	6150	7.5 IJNP	427.42 JNPIJNP	6207.1 JNPIJNP	11.4 IJNP	7.7 UJNP	26.3
FWC31835L	3.3	8.1 I	2500	13.1	181.3 I	2521.2 I	1.5 U	1.6 U	1.8 I

Field ID	Lipid (%)	4,4'-DDD (ug/kg)	4,4'-DDE (ug/kg)	4,4'-DDT (ug/kg)	4,4'-DDTr (ug/kg)	4,4'-DDTx (ug/kg)	Aldrin (ug/kg)	alpha-BHC (ug/kg)	alpha-Chlordane (ug/kg)
FWC31838B	0.1 U	1.7 UJNP	2.3 UP	1.4 U	1.89 UJNPUPU	5.4 UJNPUPU	1.3 UJNP	1.4 UJNP	0.95 U
FWC31838B	0.1 U	2 U	2.9 I	1.6 U	2.2 UIUJNP	6.6 UIUJNP	1.5 UJNP	1.7 UJNP	1.1 UJNP
FWC31838B	0.1 U	2.1 U	3.5 I	1.6 UJNP	2.23 UIU	7.1 UIU	1.6 UJNP	1.7 UJNP	1.2 UJNP
FWC31838B	0.15	2.2 UJNP	3.7 I	1.7 UJNP	2.4 UJNPIUJNP	7.6 UJNPIUJNP	1.6 UJNP	1.8 U	1.2 U
FWC31838F	25.4	28 JNP	4350	10.7 I	306.3 JNPI	4388.7 JNPI	3.9 UJNP	4.4 U	33.6
FWC31838L	3.5	0.99 U	94.9	1.8 IJNP	8.32 UIJNP	97.69 UIJNP	0.73 U	0.81 U	1.1 I
FWC31839B	0.14	1.9 UJNP	13	1.5 UJNP	3 UU	16.9 UU	1.4 UJNP	1.6 U	1.1 U
FWC31839B	0.15	1.9 U	14.9	1.5 UJNP	3.33 UUJNP	19.2 UU	1.4 U	1.6 U	1.1 U
FWC31839B	0.17	2.2 U	21.7	1.7 U	3.37 UU	25.1 UUJNP	1.6 UJNP	1.8 U	1.2 UJNP
FWC31839B	0.36	2.4 U	32.2	1.9 U	4.03 UJNPUJNP	35.6 UJNPUJNP	1.8 UJNP	2 UJNP	1.3 U
FWC31839F	34.7	34.2 JNP	11700	12.3 IJNP	799.14 JNPIJNP	11746.5 JNPIJNP	4.6 UJN	5.1 U	33.2
FWC31839L	3.1	2 UJNP	327	1.5 UJNP	23.7 UJNPUJNP	330.5 UJNPUJNP	1.5 UJNP	1.6 U	1.8 I

Field ID	Lipid (%)	4,4'-DDD (ug/kg)	4,4'-DDE (ug/kg)	4,4'-DDT (ug/kg)	4,4'-DDTr (ug/kg)	4,4'-DDTx (ug/kg)	Aldrin (ug/kg)	alpha-BHC (ug/kg)	alpha-Chlordane (ug/kg)
FWC31842B	0.1 U	0.93 UJNP	50.8	0.71 UJNP	4.3 UJNPU	52.45 UJNPU	0.69 UJNP	0.75 UJNP	0.51 U
FWC31842B	0.1 U	0.95 UJNP	54.7	0.72 U	4.6 UJNPUJNP	56.44 UJNPUJNP	0.7 UJNP	0.76 UJNP	0.52 U
FWC31842B	0.11	0.98 UJNP	63	0.74 U	5.13 UJNPU	64.69 UJNPU	0.72 UJNP	0.77 UJNP	0.53 U
FWC31842B	0.13	13.2	92.4	0.76 UJNP	9.51 UJNP	106.31 UJNP	0.96 IJNP	0.8 UJNP	1.5 I
FWC31842F	26.3	90.1 IJNP	61500	33.6 I	4151.62 IJNPI	61623.7 IJNPI	20.3 UJNP	22.5 UJN	43.3 I
FWC31842L	3.6	7.2 IJNP	4490	35.9	336 IJNP	4533.1 IJNP	3.6 UJNP	4 UJNP	5.2 I
FWC31843B	0.1 U	0.97 U	6.9	0.76 UJNP	1.84 UUJNP	9.4 UUJNP	0.72 U	0.79 U	0.53 U
FWC31843B	0.21	1.4 UJNP	15.3	1.1 U	1.974 UUJNP	17.03 UUJNP	1 UJNP	1.2 UJNP	0.75 U
FWC31843B	0.24	1.4 U	16.2	1.1 UJNP	2.46 UJNPU	18.7 UJNPU	1.1 UJNP	1.2 UJNP	0.79 UJNP
FWC31843B	0.31	1.5 UJN	18.2	1.1 U	2.6 UJNU	20.8 UJNU	1.1 U	1.4 IJNP	0.81 U
FWC31843F	44.7	32.2 UJNP	16800	25.1 UJNP	1151.54 UJNPUJNP	16857.3 UJNPUJNP	23.8 UJNP	26.4 U	27.4 I

Field ID	Lipid (%)	4,4'-DDD (ug/kg)	4,4'-DDE (ug/kg)	4,4'-DDT (ug/kg)	4,4'-DDTr (ug/kg)	4,4'-DDTx (ug/kg)	Aldrin (ug/kg)	alpha-BHC (ug/kg)	alpha-Chlordane (ug/kg)
FWC31843L	2.9	0.99 UJNP	335	0.77 UJNP	23.3 UJNPUJNP	336.76 UJNPUJNP	0.73 U	0.81 U	0.86 I
FWC31847B	0.14	0.93 UJNP	180	0.72 U	13.06 UJNU	181.94 UJNU	0.68 U	0.76 U	0.51 U
FWC31847B	0.2	1 UJNP	200	0.81 U	14.34 UJNPU	201.81 UJNPU	0.77 U	0.85 U	0.57 U
FWC31847B	0.21	1.1 UJN	211	0.84 U	14.97 UJNPU	212.65 UJNPU	0.8 UJNP	0.88 U	0.59 U
FWC31847B	0.25	148 JN	46500	17.1 UJNP	3146.7 JNUJNP	46665.1 JNUJNP	16.2 UJNP	18 UJNP	28.6 I
FWC31847F	13.3	139 IJNP	91000	91.1 UJNP	6185 IJNPUJNP	91230.1 IJNPUJNP	86.4 UJN	95.9 U	63.9 U
FWC31847L	3	9.9 UJN	6460	7.7 U	440 UJNU	6477.6 UJNU	7.3 UJNP	8.1 U	5.4 U
FWC31851-LK-042209	0.1 U	1.3 UJNP	11.2	1 U	2 UJNPU	13.5 UJNPU	1.6 UJNP	2.3 IJN	0.77 U
FWC31863-LK-042209	0.1 U	1 UJNP	16.1	0.77 UJN	2.04 UJNPUJN	17.87 UJNPUJN	1.2 UJN	1.5 IJN	0.59 U
FWC31891B	0.1 U	1 UJNP	17.2	0.78 UJNP	2.4 UJNPUJNP	19.5 UJNPUJNP	0.74 UJNP	0.83 UJNP	0.55 U

Field ID	Lipid (%)	4,4'-DDD (ug/kg)	4,4'-DDE (ug/kg)	4,4'-DDT (ug/kg)	4,4'-DDTr (ug/kg)	4,4'-DDTx (ug/kg)	Aldrin (ug/kg)	alpha-BHC (ug/kg)	alpha-Chlordane (ug/kg)
FWC31891B	0.1 U	1.1 UJNP	18.4	0.85 UJNP	2.44 UJNPUJNP	20.7 UJNPUJNP	0.81 U	1.1 UJNP	0.6 U
FWC31891B	0.11	1.3 UJNP	21.9	1 UJNP	2.48 UJNPUJNP	23.68 UJNPUJNP	0.95 UJNP	1.1 U	0.7 U
FWC31891B	0.23	1.3 UJNP	42.8	1 UJNP	3.92 UJNPUJNP	44.75 UJNPUJNP	0.97 UJN	1.2 IJNP, Z2	0.72 UP
FWC31891F	26.2	30.4 IJNP	21000	43.8 I	1449.88 IJNPI	21074.2 IJNPI	17.5 U	19.5 UJNP	40 I
FWC31891L	3.7	0.99 U	672	3 IJNP	47.998 UIJNP	675.99 UIJNP	0.73 U	0.81 U	4.6
FWC31892-DU-092408	0.1 U	1.1 UJNP	7.6	0.85 UJNP	1.57 UJNPUJNP	9.55 UJNPUJNP	1.3 UJNP	2.1 IJN	0.65 U
FWC31896B	0.1 U	0.99 U	7.6	0.77 U	1.47 UU	9.36 UU	0.73 U	0.81 UJNP	0.54 U
FWC31896B	0.14	1.2 U	7.8	0.96 U	1.72 UU	9.96 UU	0.91 UJNP	1 UJNP	0.67 UP
FWC31896B	0.28	1.4 UJNP	12.1	1.1 UJNP	2.2 UJNPU	14.6 UJNPU	1 UJNP	1.2 U	0.75 U
FWC31896B	0.39	1.5 UJNP	146	1.1 U	11.13 UJNPUJNP	148.6 UJNPUJNP	1.1 U	2.7 IJN	0.8 U
FWC31896F	47.2	55.5 IJNP	10900	18.1 UJNP	756 IJNPUJNP	10974 IJNPUJNP	17.2 U	19.1 U	18 I

Field ID	Lipid (%)	4,4'-DDD (ug/kg)	4,4'-DDE (ug/kg)	4,4'-DDT (ug/kg)	4,4'-DDTr (ug/kg)	4,4'-DDTx (ug/kg)	Aldrin (ug/kg)	alpha-BHC (ug/kg)	alpha-Chlordane (ug/kg)
FWC31896L	1.4	1.3 I	213	0.88 IJNP	15.34 IIJNP	215.18 IIJNP	0.36 UJN	0.4 U	0.47 I
FWC31898B	0.1 U	0.0013 U	0.0069	0.001 U	0.00172 UU	0.0092 UU	0.00099 U	0.0011 U	0.00073 U
FWC31898B	0.1 U	0.96 UJNP	31.1	0.75 UJNP	3.03 UJNPU	32.83 UJNPU	0.71 UJNP	0.79 U	0.52 U
FWC31898B	0.1 U	0.97 UJNP	44.5	0.76 U	4.04 UUJNP	46.45 UUJNP	0.72 UJNP	0.79 UJNP	0.53 U
FWC31898B	0.1 U	1.1 U	89.9	0.85 UJNP	6.935 UJNPUJNP	91.61 UJNPUJNP	0.81 UJN	0.9 UJNP	0.6 U
FWC31898F	47.3	472 IJNP	161000	333 I	11160 IJNPI	161805 IJNPI	106 UJNP	117 U	307 I
FWC31898L	3.9	21.5 IJNP	5650	21.2 I	402 IJNPI	5692.7 IJNPI	3.6 UJNP	4 UJNP	12 I
FWC31899B	0.1 U	0.93 U	5.9 I	0.73 U	1.53 UU	8.6 UJNPIU	0.69 UJNP	0.76 U	0.51 U
FWC31899B	0.1 U	1.3 U	7.3	1 U	1.74 UU	9.6 UU	0.96 UJNP	1.1 UJNP	0.71 U
FWC31899B	0.1 U	1.5 UJNP	9.2	1.2 UJNP	1.89 UJNPIU	10.86 UU	1.1 UJNP	1.2 IJNP	0.82 U
FWC31899B	0.11	1.6 U	14.1	1.2 U	2.46 UUJNP	16.9 UUJNP	1.2 U	1.3 U	0.87 U

Field ID	Lipid (%)	4,4'-DDD (ug/kg)	4,4'-DDE (ug/kg)	4,4'-DDT (ug/kg)	4,4'-DDTr (ug/kg)	4,4'-DDTx (ug/kg)	Aldrin (ug/kg)	alpha-BHC (ug/kg)	alpha-Chlordane (ug/kg)
FWC31899F	40.4	57.2 I	12200	36 IJNP	860 IIJNP	12293.2 IIJNP	10.8 U	11.9 UJNP	17 I
FWC31899L	2.4	0.99 UJNP	160	2.2 IJNP	13.06 UJNPIJNP	163.19 UJNPIJNP	0.73 UJNP	0.81 UJNP	0.74 I
FWC32024-DU-042209	0.1	1.5 UJNP	12.4	1.2 U	2.3 UJNPU	15.1 UJNPU	1.8 UJNP	1.5 IJNP	0.9 U
FWC32051-WM-091708	0.11	1.6 U	39.1	1.2 UJNP	4.13 UUJNP	41.9 UUJNP	1.9 UJNP	2.6 IJNP	0.94 U
FWC32052-WM-091708	0.13	1.3 UJNP	35.9	1 UJN	3.65 UJNPUJN	38.2 UJNPUJN	1.6 UJNP	2 IJNP	0.77 U
FWC32053-WM-091708	0.1 U	1.5 U	30.1	1.1 UJNP	3.4 UUJNP	32.7 UUJNP	1.7 UJNP	2.2 IJNP	0.85 U
FWC32054-WM-091708	0.15	1.5 U	78.4	1.1 U	6.63 UU	81 UU	1.7 UJN	4.3 JN	0.85 U
FWC32055-WM-091708	0.1 U	1.4 UJNP	19.8	1.1 UJNP	2.7 UJNPUJNP	22.3 UJNPUJNP	1.7 UJNP	2.7 IJNP	0.82 U
FWC32056-WM-091708	0.11	1.4 UJNP	97.9	1.1 UJNP	7.9 UJNPUJNP	100.4 UJNPUJNP	1.7 UJNP	2.5 IJN	0.82 U
FWC32057-WM-091708	0.11	1.5 UJNP	130	1.1 UJNP	10.06 UJNPUJNP	132.6 UJNPUJNP	1.8 UJN	2.5 IJN	0.86 U
FWC32058-WM-091708	0.14	1.4 UJN	116	1 UJNP	9.01 UJNUJNP	118.4 UJNUJNP	1.6 UJNP	1.7 IJNP	0.8 U

Field ID	Lipid (%)	4,4'-DDD (ug/kg)	4,4'-DDE (ug/kg)	4,4'-DDT (ug/kg)	4,4'-DDTr (ug/kg)	4,4'-DDTx (ug/kg)	Aldrin (ug/kg)	alpha-BHC (ug/kg)	alpha-Chlordane (ug/kg)
FWC32059-WM-091708	0.17	1.5 UJN	116	1.1 UJNP	9.133 UJNUJNP	118.6 UJNUJNP	1.8 UJNP	2.4 IJN	0.87 U
FWC32060-WM-092408	0.11	1.5 UJN	28.9	1.1 UJNP	3.33 UJNUJNP	31.5 UJNUJNP	1.8 UJNP	2.4 IJNP	0.86 U
FWC32061-WM-092408	0.11	1.5 UJN	62.6	1.1 UJN	5.57 UJNUJN	65.2 UJNUJN	1.8 UJN	2.7 IJNP	1.1 I
FWC32062-WM-092408	0.2	1.5 UJN	81.9	1.1 UJNP	6.86 UJNUJNP	84.5 UJNUJNP	1.8 UJNP	1.9 IJNP	0.86 U
FWC32063-WM-092408	0.16	1.2 UJN	82.8	0.91 UJNP	6.67 UJNUJNP	84.91 UJNUJNP	1.4 UJN	2.3 IJNP	1.5 I
FWC32064-WM-092408	0.14	2.7 I	72.2	1.1 UJNP	6.45 IUJNP	76 IUJNP	1.7 UJNP	2.2 I	1.9 I
FWC32065-DU-092408	0.15	1.4 UJNP	19.6	1.1 UJNP	2.68 UJNPUJNP	22.1 UJNPUJNP	1.7 UJN	2.7 IJN	0.81 U
FWC32069-WM-040809	0.14	2.9 UJNP	23.3	2.2 UJNP	4.3 UJNPUJNP	28.4 UJNPUJNP	3.4 UJNP	4.5 IJN	1.7 U
FWC32073-WM-040809	0.16	1.4 UJNP	25.7	1.1 UJN	3.09 UJNPUJN	28.2 UJNPUJN	1.7 UJNP	2.2 IJN	0.82 U
FWC32110-LK-032509	0.19	1.4 UJNP	20.4	1.1 UJN	2.74 UJNPUJN	22.9 UJNPUJN	1.7 UJN	2.8 IJN	0.81 U
FWC32119-LK-032509	0.14	1.1 UJNP	21	0.84 UJNP	2.46 UJNPUJNP	22.94 UJNPUJNP	1.3 UJNP	0.8 IJNP	0.64 U
FWC32125-DU-092408	0.17	1.3 UJNP	21.4	0.96 UJNP	2.6 UJNPUJNP	23.66 UJNPUJNP	1.5 U	2 IJN	1 I

Field ID	Lipid (%)	4,4'-DDD (ug/kg)	4,4'-DDE (ug/kg)	4,4'-DDT (ug/kg)	4,4'-DDTr (ug/kg)	4,4'-DDTx (ug/kg)	Aldrin (ug/kg)	alpha-BHC (ug/kg)	alpha-Chlordane (ug/kg)
FWC32126-DU-092408	0.12	1.5 U	6.2 I	1.1 UJNP	1.81 UIUJNP	8.8 UIUJNP	1.7 UJN	0.75 U	0.85 U
FWC32129-U2W-040809	0.19	1.1 UJN	22.3	0.86 UJN	2.56 UJNUJN	24.26 UJNUJN	1.3 UJN	1.2 IJNP	0.65 U
FWC32136-LK-031609	0.11	1.1 UJNP	9.6	0.84 UJNP	1.7 UJNPUJNP	11.54 UJNPUJNP	1.3 UJNP	1.7 IJN	0.64 U
FWC32142-DU-033109	0.18	1.1 UJNP	9.8	0.87 UJNP	1.74 UJNPUJNP	11.77 UJNPUJNP	1.4 U	1.1 IJN	0.67 U
FWC32145-DU-033109	0.17	1.2 UJNP	15.9	0.93 UJNP	2.23 UJNPUJNP	18.03 UJNPUJNP	1.5 UJNP	0.63 U	0.71 U
FWC32150-DU-033109	0.15	3.1 UJNP	67	2.4 UJNP	7.49 UJNPUJNP	72.5 UJNPUJNP	3.7 U	1.6 U	1.8 U
FWC32151-DU-033109	0.16	1.1 UJNP	23.3	0.83 UJN	2.6 UJNPUJN	25.23 UJNPUJN	1.3 U	0.56 U	0.63 U
FWC32152-LK-032509	0.15	0.99 UJNP	11.4	0.76 UJNP	1.718 UJNPUJNP	13.15 UJNPUJNP	1.2 UJN	1.2 IJN	0.58 U
FWC32153-U2W-040809	0.23	3.4 UJNP	8.3 I	2.6 UJN	3.83 UJNPIUJN	14.3 UJNPIUJN	4 UJNP	1.7 U	2 U
FWC32154-LK-031609	0.14	1.5 UJNP	7.3	1.1 UJNP	1.88 UJNPUJNP	9.9 UJNPUJNP	1.8 UJN	0.77 U	0.87 U

Field ID	Lipid (%)	4,4'-DDD (ug/kg)	4,4'-DDE (ug/kg)	4,4'-DDT (ug/kg)	4,4'-DDTr (ug/kg)	4,4'-DDTx (ug/kg)	Aldrin (ug/kg)	alpha-BHC (ug/kg)	alpha-Chlordane (ug/kg)
FWC32157-LK-032509	0.12	0.98 UJNP	45	0.74 UJNP	3.94 UJNPUJNP	46.72 UJNPUJNP	1.2 UJN	0.5 U	0.86 I
FWC32158-LK-031709	0.1 U	1.4 UJN	4.5 I	1.1 UJNP	1.68 UJNIUJNP	7 UJNIUJNP	1.7 UJNP	3.3 JN	0.81 U
FWC32160-LK-033109	0.1 U	1.5 UJN	11.1	1.1 UJN	2.14 UJNUJN	13.7 UJNUJN	1.8 UJNP	3.7 JN	0.87 U
FWC32161-U2W-040809	0.1 U	1.1 UJNP	18.8	0.83 UJN	2.3 UJNPUJN	20.73 UJNPUJN	1.3 UJN	2.2 IJN	0.63 U
FWC32168-LK-041509	0.1 U	1.9 UJNP	13.7	1.5 UJN	2.79 UJNPUJN	17.1 UJNPUJN	2.3 UJN	1 U	1.1 U
FWC32169-DU-033109	0.15	1.7 UJN	15.6	1.3 UJNP	2.68 UJNUJNP	18.6 UJNUJNP	2 UJN	0.88 U	1 U
FWC32173-LK-031709	0.1 U	2.2 UJN	4.1 I	1.7 UJNP	2.4 UJNIUJNP	8 UJNIUJNP	2.7 UJNP	3.2 IJN	1.3 U
FWC32176-U2W-090408	0.13	1.5 UJNP	14.1	1.1 UJNP	2.34 UJNPUJNP	16.7 UJNPUJNP	1.8 UJNP	2.2 IJNP	0.86 U
FWC32177-U2W-090408	0.13	1.5 UJNP	35.5	1.1 UJN	3.76 UJNPUJN	38.1 UJNPUJN	1.8 UJN	3.8 JN	0.86 U
FWC32178-U2W-	0.17	1.6 UJNP	13.3	1.2 UJN	2.4 UJNPUJN	16.1 UJNPUJN	1.9 UJN	0.82 U	0.92 U

Field ID	Lipid (%)	4,4'-DDD (ug/kg)	4,4'-DDE (ug/kg)	4,4'-DDT (ug/kg)	4,4'-DDTr (ug/kg)	4,4'-DDTx (ug/kg)	Aldrin (ug/kg)	alpha-BHC (ug/kg)	alpha-Chlordane (ug/kg)
090408									
FWC32180-U2W-090408	0.13	1.1 UJN	8.2	0.82 UJNP	1.58 UJNUJNP	10.12 UJNUJNP	1.3 UJNP	2.7 JN	0.63 U
FWC32181-U2W-090408	0.13	1.2 UJNP	13.6	0.94 UJNP	2.09 UJNPUJNP	15.74 UJNPUJNP	1.5 UJN	2.6 IJN	0.72 U
FWC32182-U2W-090408	0.1 U	1.1 U	10.9	0.81 UJN	1.76 UUJN	12.81 UUJN	1.3 UJNP	2.5 IJN	0.62 U
FWC32183-U2W-090408	0.15	1.4 UJNP	17.4	1.1 UJNP	2.54 UJNPUJNP	19.9 UJNPUJNP	1.7 U	1.8 IJNP	0.99 I
FWC32184-U2W-090408	0.1 U	1.5 UJNP	8.5	1.2 UJN	2.06 UJNPUJN	11.2 UJNPUJN	1.8 UJN	2.9 IJN	0.88 U
FWC32185-U2W-090408	0.1	1.3 UJNP	28.5	1 UJNP	3.16 UJNPUJNP	30.8 UJNPUJNP	1.6 UJNP	3 IJNP	0.78 U
FWC32186-U2W-	0.14	1.1 UJNP	19.7	0.81 UJN	2.3 UJNPUJN	21.61 UJNPUJN	1.3 UJN	2.6 JN	0.62 U

Field ID	Lipid (%)	4,4'-DDD (ug/kg)	4,4'-DDE (ug/kg)	4,4'-DDT (ug/kg)	4,4'-DDTr (ug/kg)	4,4'-DDTx (ug/kg)	Aldrin (ug/kg)	alpha-BHC (ug/kg)	alpha-Chlordane (ug/kg)
090408									
FWC32187-U2W-090408	0.12	1.5 UJNP	20.1	1.2 UJNP	2.84 UJNPUJNP	22.8 UJNPUJNP	1.8 UJN	2.5 IJN	0.9 U
FWC32188-U2W-090408	0.11	1.4 UJNP	29.7	1 UJN	3.26 UJNPUJN	32.1 UJNPUJN	1.6 U	2 IJNP	0.8 U
FWC32189-U2W-090408	0.1 U	1.4 UJNP	27.3	1 UJNP	3.1 UJNPUJNP	29.7 UJNPUJNP	1.6 UJN	2.6 IJNP	0.8 U
FWC32190-U2W-090408	0.14	1 UJNP	12.5	0.77 UJN	1.8 UJNPUJN	14.27 UJNPUJN	1.2 UJN	2 IJNP	0.59 U
FWC32191-U2W-090408	0.18	1.6 UJNP	17.9	1.2 UJNP	2.7 UJNPUJNP	20.7 UJNPUJNP	1.9 U	3.4 IJNP	0.91 U
FWC32192-U2W-090408	0.14	1.5 UJNP	14.4	1.2 UJNP	2.46 UJNPUJNP	17.1 UJNPUJNP	1.8 U	3.1 IJNP	0.88 U
FWC32193-U2W-	0.19	1.6 UJN	12.3	1.2 UJNP	2.34 UJNUJNP	15.1 UJNUJNP	1.9 UJNP	7.8 JN	0.91 U

Field ID	Lipid (%)	4,4'-DDD (ug/kg)	4,4'-DDE (ug/kg)	4,4'-DDT (ug/kg)	4,4'-DDTr (ug/kg)	4,4'-DDTx (ug/kg)	Aldrin (ug/kg)	alpha-BHC (ug/kg)	alpha-Chlordane (ug/kg)
090408									
FWC32194-LK-032509	0.1 U	0.98 UJN	5.1	0.74 UJNP	1.276 UJNUJNP	6.82 UJNUJNP	1.2 U	2 IJN	0.57 U
FWC32195-LK-031609	0.16	1.3 UJNP	10.4	0.96 UJNP	1.91 UJNPUJNP	12.66 UJNPUJNP	1.5 UJNP	0.65 U	0.73 U
FWC32198-LK-031609	0.1 U	1.1 U	7.4	0.82 UJN	1.53 UUJN	9.32 UUJN	1.3 UJNP	0.93 IJNP	0.63 U
FWC32199-LK-032509	0.1 U	1.5 UJNP	8.8	1.2 UJNP	2.09 UJNPUJNP	11.5 UJNPUJNP	1.8 UJNP	0.78 U	0.88 U
FWC32200-LK-031609	0.16	1.1 UJN	15	0.85 U	2.07 UJNU	16.95 UJNU	1.3 UJNP	2.8 JN	0.65 U
FWC32508-LK-101008	0.13	1.1 UJN	4.8 I	0.86 UJN	1.4 UJNIUJN	6.76 UJNIUJN	1.3 UJNP	1.9 IJN	0.65 U
FWC32750-LK-041509	0.14	1.5 U	9.7	1.1 UJN	2.05 UUJN	12.3 UUJN	1.8 UJNP	4.2 JN	0.86 U
FWC32771-U2W-040809	0.13	1.9 UJNP	6.4 I	1.4 UJNP	2.2 UJNPIUJNP	9.7 UJNPIUJNP	2.3 UJNP	0.98 U	1.1 U
FWC32776-LK-041509	0.1 U	1 U	10.6	0.8 UJNP	1.71 UUJNP	12.4 UUJNP	1.2 UJNP	3.4 JN	0.61 U
FWC32787-LK-041509	0.18	1.1 UJN	21.3	0.82 UJNP	2.46 UJNUJNP	23.22 UJNUJNP	1.3 UJN	2.5 IJNP	0.63 U

Field ID	Lipid (%)	4,4'-DDD (ug/kg)	4,4'-DDE (ug/kg)	4,4'-DDT (ug/kg)	4,4'-DDTr (ug/kg)	4,4'-DDTx (ug/kg)	Aldrin (ug/kg)	alpha-BHC (ug/kg)	alpha-Chlordane (ug/kg)
GFC 37192-FT	63.2	29 UP	11000	23 U	762 UPU	11052 UPU	22 UJNP	24 U	16 U
GFC 37192-SC	0.74	6.6 U	70	5.2 U	11.19 UU	81.8 UU	4.9 U	5.4 UJNP	3.6 U
GFC 37193-FT	50.2	23 U	15000	18 UJNP	1022.6 UUJNP	15041 UUJNP	17 UJNP	19 U	80
GFC 37193-SC	0.13	4.1 UJNP	11 I	3.2 U	4.75 UJNPIU	18.3 UJNPIU	3.1 U	3.4 UJNP	2.3 U
LA-CI-07-01	1.12	0.49 UJNP	5.5	0.38 U	0.84 UJNPU	6.37 UJNPU	0.36 UJNP	0.4 U	0.27 U
LA-CI-07-02	2.31	0.49 UJNP	9.9	0.38 UJNP	1.14 UJNPUJNP	10.77 UJNPUJNP	0.36 UJNP	0.4 U	0.27 I
LA-CI-07-03	2.17	0.49 UJNP	93	0.57 IJNP	6.87 UJNPIJNP	94.06 UJNPIJNP	0.36 UJNP	0.4 U	0.27 U
LA-CI-07-04	0.94	0.49 UJNP	3.9	0.38 U	0.738 UJNPU	4.77 UJNPU	0.36 UJNP	0.4 U	0.27 U
LA-CI-07-05	1.89	0.49 UJNP	10	0.38 UJN	1.14 UJNPUJN	10.87 UJNPUJN	0.36 UJNP	0.4 U	0.27 UJNP
LA-CI-07-06	1.47	0.49 UJNP	6.1	0.38 UJNP	0.88 UJNPUJNP	6.97 UJNPUJNP	0.36 UJNP	0.4 U	0.27 U
LA-CI-07-07	1.19	0.49 UP	6.9	0.38 U	0.94 UPU	7.77 UPU	0.36 UJNP	0.4 U	0.27 U
LA-NE-07-08	3	0.99 UJNP	51	0.77 UJNP	4.368	52.76 UJNPUJNP	2.2 IJNP	0.81 UJNP	0.55 I

Field ID	Lipid (%)	4,4'-DDD (ug/kg)	4,4'-DDE (ug/kg)	4,4'-DDT (ug/kg)	4,4'-DDTr (ug/kg)	4,4'-DDTx (ug/kg)	Aldrin (ug/kg)	alpha-BHC (ug/kg)	alpha-Chlordane (ug/kg)
					UJNPUJNP				
LA-NE-07-09	1.93	2 I	64	0.77 UJNP	5.44 IUJNP	66.77 IUJNP	0.73 U	0.81 UJNP	0.85 I
LA-NE-07-10	2.31	0.99 UJNP	22	0.77 U	2.4 UJNPU	23.76 UJNPU	0.73 U	0.81 UJNP	0.59 I
LA-NE-07-11	2.92	0.99 UJNP	140	0.77 U	10.3 UJNPU	141.76 UJNPU	0.73 U	1.5 IJNP	0.74 I
LA-NE-07-12	3.25	0.99 UJNP	51	0.77 UJNP	4.368 UJNPUJNP	52.76 UJNPUJNP	0.73 U	0.81 UJNP	0.7 I
LA-NE-07-13	1.77	0.99 UJNP	160	0.77 U	11.6 UJNPU	161.76 UJNPU	0.73 U	1.1 IJNP	0.73 I
LA-NE-07-14	0.41	0.99 U	2.6 IP	0.77 U	1.14 UIPU	4.36 UIPU	0.73 U	0.81 UJNP	0.7 I
LA-NE-07-16	3.14	1 IJNP	56	0.77 UJNP	4.7 IJNPUJNP	57.77 IJNPUJNP	0.73 U	0.81 UJNP	1 I
LA-NE-07-17	1.75	0.56 IJNP	17	0.38 UJNP	1.62 IJNPUJNP	17.94 IJNPUJNP	0.36 U	0.42 IJNP	0.76 I
LA-NE-07-18	1.4	1.7 IJNP	33	0.38 UJNP	2.92 IJNPUJNP	35.08 IJNPUJNP	1.5 JN	2.3 JN	0.85 I
LA-NE-07-19	1.31	1.2 IJN	20	0.38 UJN	1.95 IJNUJN	21.58 IJNUJN	0.36 U	0.4 U	0.27 U

Field ID	Lipid (%)	4,4'-DDD (ug/kg)	4,4'-DDE (ug/kg)	4,4'-DDT (ug/kg)	4,4'-DDTr (ug/kg)	4,4'-DDTx (ug/kg)	Aldrin (ug/kg)	alpha-BHC (ug/kg)	alpha-Chlordane (ug/kg)
LA-NE-07-20	1.16	2 IJNP	26	0.38 UJNP	2.51IJNPUJNP	28.38 IJNPUJNP	0.57 IJN	1.1 IJNP	0.72 I
U2W-MC-07-02	1.69	0.65 IJNP	54	0.42 UJNP	4.15 IJNPUJNP	55.07 IJNPUJNP	0.67 IJNP	1.7 JNP	0.4 IP
U2W-MC-07-03	2.32	0.49 UJNP	70	0.38 UJNP	5.14 UJNPUJNP	70.87 UJNPUJNP	0.36 UJNP	1.1 IJNP	1.9
U2W-MC-07-04	2.22	0.97 IJNP	62	0.75 U	5.08 IJNPU	63.72 IJNPU	0.7 UJNP	1.8 IJNP	0.74 I
U2W-MC-07-05	2.64	1.3 IJNP	160	0.77 IJNP	11.7 IJNPIJNP	162.07 IJNPIJNP	0.36 U	1.1 IJNP	0.56 I
U2W-MC-07-06	1.68	3.4	110	0.38 U	8.39 U	113.78 U	0.36 U	0.4 U	0.33 I
U2W-MC-07-07	0.86	0.49 UJNP	46	0.38 U	3.5 UJNPU	46.87 UJNPU	0.36 U	0.4 U	0.67 I
U2W-MC-07-08	1	0.51 IJNP	42	0.38 UJNP	3.282 IJNPUJNP	42.89 IJNPUJNP	0.36 U	0.85 IJNP	1.6
U2W-MC-07-09	1.15	0.63 IJNP	85	0.38 UJN	6.17 IJNPUJN	86.01 IJNPUJN	0.36 U	2.1 JNP	0.42 I
U2W-MC-07-10	1.14	0.8 IJNP	99	0.38 UJN	7.14 IJNPUJN	100.18 IJNPUJN	0.64 IJNP	0.6 IJNP	0.27 U
U2W-MC-07-11	1.44	0.49 UJNP	56	0.38 UJN	4.2 UJNPUJN	56.87 UJNPUJN	0.5 IJNP	0.62 IJNP	0.27 U
U2W-MC-07-12	1.14	1.1 IJNP	110	0.38 UJNP	7.93 IJNPUJNP	111.48 IJNPUJNP	8.3 JN	0.86 IJNP	0.27 UP

Field ID	Lipid (%)	4,4'-DDD (ug/kg)	4,4'-DDE (ug/kg)	4,4'-DDT (ug/kg)	4,4'-DDTr (ug/kg)	4,4'-DDTx (ug/kg)	Aldrin (ug/kg)	alpha-BHC (ug/kg)	alpha-Chlordane (ug/kg)
U2W-MC-07-13	2.28	0.49 UJNP	52 J	0.38 UJNP	3.94 UJNPJUJNP	52.87 UJNPJUJNP	0.69 IJNP	1.3 JNP	0.33 IP
U2W-MC-07-14	1.1	0.6 IJNP	36	0.38 U	2.9 IJNPU	36.98 IJNPU	0.36 UJNP	0.94 IJNP	0.27 UP
U2W-MC-07-15	2.42	0.49 UJNP	88	0.55 I	6.51 UJNPI	89.04 UJNPI	0.75 IJNP	0.5 IJNP	0.27 UP
U2W-MC-07-16	2.12	1.5 IJNP	120	0.38 UJNP	8.68 IJNPUJNP	121.88 IJNPUJNP	0.7 IJNP	0.72 IJNP	0.27 U
U2W-MC-07-17	1.46	0.49 UJNP	52	0.38 UJNP	3.94 UJNPUJNP	52.87 UJNPUJNP	0.36 UJNP	0.56 IJNP	0.62 I
U2W-MC-07-18	1.31	0.49 UJNP	79	0.38 UJNP	5.75 UJNPUJNP	79.87 UJNPUJNP	0.56 IJN	0.49 IJNP	0.28 I
U2W-MC-07-19	2.47	1.8 IJNP	110	0.38 UJNP	8.07 IJNPUJNP	112.18 IJNPUJNP	1.6 JNP	1.3 JNP	2.7
U2W-MC-07-20	2.09	0.8 IJNP	84	0.67 IJNP	6.43 IJNPIJNP	85.47 IJNPIJNP	0.36 U	0.4 UJNP	0.27 UP
U2W-RC-07-01	0.81	2.2 UJNP	7.4 I	1.7 UJNP	2.6 UJNPIUJNP	11.3 UJNPIUJNP	1.6 U	2.8 IJNP	1.2 U
WM-G-07-01	1.12	0.49 UP	39 J	0.38 U	3.08 UPJU	39.87 UPJU	0.36 UJ	0.4 UJ	0.45 I
WM-G-07-02	1.42	0.51 IP	96	0.38 U	6.882 IPU	96.89 IPU	0.36 UJNP	0.4 U	0.27 U

Field ID	Lipid (%)	4,4'-DDD (ug/kg)	4,4'-DDE (ug/kg)	4,4'-DDT (ug/kg)	4,4'-DDTr (ug/kg)	4,4'-DDTx (ug/kg)	Aldrin (ug/kg)	alpha-BHC (ug/kg)	alpha-Chlordane (ug/kg)
WM-G-07-03	1.52	0.53 IJN	40	0.38 U	3.15 IJNU	40.91 IJNU	0.53 IJNP	0.4 U	0.47 I
WM-G-07-04	0.72	0.49 UJNP	65	0.38 UJNP	4.81 UJNPUJNP	65.87 UJNPUJNP	0.36 UJNP	0.4 UJNP	0.27 U
WM-G-07-05	1.65	1.1 IP	85	0.38 U	6.27 IPU	86.48 IPU	0.77 IJNP	0.4 U	0.53 I
WM-G-07-06	0.45	0.49 UJNP	5	0.38 UJNP	0.81 UJNPUJNP	5.87 UJNPUJNP	0.43 IJNP	0.4 UJNP	0.27 U
WM-G-07-07	0.37	0.49 UJNP	21	0.38 UJNP	1.878 UJNPUJNP	21.87 UJNPUJNP	0.36 UJNP	0.4 UJNP	0.27 U
WM-G-07-08	1.02	1.5 I	58	0.38 UJNP	4.54 IUJNP	59.88 IUJNP	0.86 IJNP	0.4 U	0.65 I
WM-G-07-09	1.06	0.49 UP	74	0.38 U	5.41 UPU	74.87 UPU	0.36 UJNP	0.4 UJNP	0.27 U
WM-G-07-10	0.83	0.49 UJNP	77	0.38 UJNP	5.61 UJNPUJNP	77.87 UJNPUJNP	0.48 IJNP	0.4 U	0.27 U
WM-G-07-11	0.54	0.54 IJNP	33	0.38 UJNP	2.688 IJNPUJNP	33.92 IJNPUJNP	0.36 UJNP	0.4 U	0.27 U
WM-G-07-12	0.94	0.99 U	54	0.77 UJN	4.568 UUJN	55.76 UUJN	0.73 U	1.7 IJNP	1 I
WM-G-07-13	0.68	0.99 UJNP	34	0.77 UJNP	3.23 UJNPUJNP	35.76 UJNPUJNP	0.73 UJNP	1.2 IJNP	0.93 I

Field ID	Lipid (%)	4,4'-DDD (ug/kg)	4,4'-DDE (ug/kg)	4,4'-DDT (ug/kg)	4,4'-DDTr (ug/kg)	4,4'-DDTx (ug/kg)	Aldrin (ug/kg)	alpha-BHC (ug/kg)	alpha-Chlordane (ug/kg)
WM-G-07-14	1.08	0.99 UJNP	77	1.3 IJN	6.63 UJNPIJN	79.29 UJNPIJN	0.73 U	1.2 IJNP	0.8 I
WM-G-07-15	1.55	1.1 IJNP	130	0.77 UJNP	9.66 IJNPUJNP	131.87 IJNPUJNP	0.73 U	1 IJNP	3.1
WM-G-07-16	0.73	0.99 U	74	0.77 UJNP	5.9 UUJNP	75.76 UUJNP	0.73 U	1.4 IJNP	0.54 U
WM-G-07-17	1.92	1 IJNP	170	0.77 UJNP	12.3 IJNPUJNP	171.77 IJNPUJNP	0.73 U	1.9 IJNP	1.2 I
WM-G-07-18	0.87	1.5 IJNP	120	0.77 UJNP	9.07 IJNPUJNP	122.27 IJNPUJNP	1.1 IJNP	0.81 UJNP	0.64 I
WM-G-07-19	0.54	1.1 IJNP	27	0.77 UJN	2.79 IJNPUJN	28.87 IJNPUJN	0.73 U	1.1 IJNP	0.54 UJNP
WM-G-07-20	2.08	0.99 UJNP	47	0.77 UJN	4.1 UJNPUJN	48.76 UJNPUJN	1.3 IJNP	1.4 IJNP	0.54 UP
ZNWA PIGFROG1	2.2	0.5 U	54.6	0.38 UJNP	4.12 UUJNP	55.48 UUJNP	0.36 U	0.4 UJNP	0.27 U
ZNWA PIGFROG2	0.64	0.5 UJNP	23	0.38 UJNP	2.01 UJNPUJNP	23.88 UJNPUJNP	0.36 U	0.4 U	0.27 U
ZNWB PIGFROG1	1.5	0.5 UJNP	26	0.38 U	2.2 UJNPU	26.88 UJNPU	0.36 UJNP	0.4 UJNP	0.27 U
ZNWB PIGFROG2	1.2	0.5 UJNP	50.1	0.38 U	3.82 UJNPU	50.98 UJNPU	0.36 U	0.4 UJNP	0.27 U
ZNWC PIGFROG1	1.1	0.5 UJNP	68.1	0.38 UJNP	5.02 UJNPUJNP	68.98 UJNPUJNP	0.36 U	0.4 U	0.27 U

Field ID	Lipid (%)	4,4'-DDD (ug/kg)	4,4'-DDE (ug/kg)	4,4'-DDT (ug/kg)	4,4'-DDTr (ug/kg)	4,4'-DDTx (ug/kg)	Aldrin (ug/kg)	alpha-BHC (ug/kg)	alpha-Chlordane (ug/kg)
ZNWC PIGFROG2	1.7	0.5 UJNP	130	0.38 UJNP	9.146 UJNPUJNP	130.88 UJNPUJNP	0.36 U	0.4 U	0.27 U
ZSWA PIGFROG1	2.5	0.5 U	49.6	0.38 UJNP	3.79 UUJNP	50.48 UUJNP	0.36 UJNP	0.4 UJNP	0.3 I
ZSWA PIGFROG2	2.4	0.5 U	80.9	0.38 UJNP	5.84 UUJNP	81.78 UUJNP	0.36 UJNP	0.4 U	0.27 U
ZSWA PIGFROG3	0.54	0.5 U	14.7	0.38 U	1.46 UU	15.58 UU	0.36 UJJNP	0.4 UJ	0.27 U
ZSWC PIGFROG1	2.3	0.76 IJNP	266	0.71 IJNP	15.59 IJNPIJNP	267.47 IJNPIJNP	0.36 U	0.4 U	1.3
ZSWC PIGFROG2	1.8	0.64 IJNP	196	0.77 IJNP	13.96 IJNPIJNP	197.41 IJNPIJNP	0.36 U	0.4 U	0.27 U
ZSWC PIGFROG3	1.8	0.5 UJNP	172	0.38 UJNP	11.95 UJNPUJNP	172.88 UJNPUJNP	0.36 U	0.4 U	0.75 I

Appendix G-2: Analysis data for OCP sample collections from Lake Apopka and the NSRA in 2007. Results from OCP analysis showing beta-BHC, cis-nonachlor, delta-BHC, Dieldrin, Endosulfan I, Endosulfan II, Endosulfan Sulfate, and Endrin. Comment codes are defined at the end of this appendix.

Field ID	beta-BHC (ug/kg)	cis-nonachlor (ug/kg)	delta-BHC (ug/kg)	Dieldrin (ug/kg)	Endosulfan I (ug/kg)	Endosulfan II (ug/kg)	Endosulfan Sulfate (ug/kg)	Endrin (ug/kg)
31203-FT	28 UJNP	400	32 U	120 I	18 U	60 IJN	49 UJNP	22 UJNP
31203-SC	8.5 UJNP	6.1 UJNP	9.6 U	5.9 U	5.4 UJNP	9.1 UJNP	15 U	6.7 U
31206-FT	120 U	100 I	130 UJNP	570 I	73 U	120 UJN	200 U	91 U
31206-SC	9 UJNP	6.4 U	10 U	6.2 UP	5.7 U	9.6 UJNP	16 U	7.1 UJNP
31224-BL	0.88 U	0.62 U	0.98 U	1 I	0.55 U	0.94 U	1.5 U	0.69 U
31224-FT	30 U	230	33 U	580	19 U	32 U	52 UJN	23 UJNP
31224-LV	2.4 IJN	6.2 JNP	1.8 IJNP	19	0.67 U	4.9 IJNP	9.1 JNP	0.85 U
31224-MS	1.2 UJNP	0.84 I	1.3 UJNP	2.4 I	0.73 U	1.2 UJNP	2 U	0.92 U
31224-SC	6.1 UJN	4.4 UJNP	6.9 UJNP	7.1 I	3.9 U	6.6 UJNP	11 U	4.8 U
31225-BL	0.46 U	1.7	0.52 U	1.9 I	0.29 U	0.49 UJNP	0.8 U	0.36 UJN
31225-FT	77 UJNP	1100	86 U	700	48 U	110 IJNP	130 U	61 U

Field ID	beta-BHC (ug/kg)	cis-nonachlor (ug/kg)	delta-BHC (ug/kg)	Dieldrin (ug/kg)	Endosulfan I (ug/kg)	Endosulfan II (ug/kg)	Endosulfan Sulfate (ug/kg)	Endrin (ug/kg)
31225-LV	3.9 UJNP	45	4.3 UJNP	33	2.4 U	8 IJNP	6.8 UJNP	3.1 UJNP
31225-MS	1.4 UJNP	15	1.5 U	10	0.86 U	1.5 UJNP	2.4 U	1.1 UJN
31225-SC	10 UJNP	32	11 UJN	19 IJNP	6.4 U	11 UJNP	18 U	8.1 UJNP
31225-ST	1.4 U	5.9 JNP	1.5 U	8.5 JNP	0.87 U	2.8 IJNP	2.4 UJNP	1.3 IJNP
31297-FT	3.4 UJNP	21 JNP	3.9 UJNP	69	2.2 U	5.7 IJNP	6 UJNP	2.7 U
31297-SC	23 UJNP	16 U	25 U	16 UJNP	14 UJNP	24 UJN	39 U	18 UJNP
31298-FT	1.5 U	7 JNP	1.7 UJN	26	0.97 U	6.2 IJNP	2.7 UJNP	1.2 U
31298-SC	9.7 IJNP	5.1 U	8 U	4.9 UJNP	4.5 UJNP	7.6 UJN	12 U	5.6 U
31299-BL	0.52 IJN	0.44 I	0.52 U	0.62 I	0.29 U	0.49 UJNP	0.8 U	0.36 U
31299-FT	18 U	550	20 U	450	11 U	50 IJNP	31 UJNP	31 IJN
31299-LV	3.3 JNP	24 JNP	2.1 IJNP	15 P	0.76 U	7.7 JNP	11 JNP	0.96 U
31299-MS	2.2 UJNP	40	2.5 UJNP	34	1.4 U	3.2 IJNP	3.9 UJNP	2.5 IJNP

Field ID	beta-BHC (ug/kg)	cis-nonachlor (ug/kg)	delta-BHC (ug/kg)	Dieldrin (ug/kg)	Endosulfan I (ug/kg)	Endosulfan II (ug/kg)	Endosulfan Sulfate (ug/kg)	Endrin (ug/kg)
31299-SC	7.1 U	5 U	7.9 U	4.9 UJNP	4.4 U	7.6 U	12 U	5.6 U
31300-BL	0.54 U	0.66 I	0.61 UJN	0.62 I	0.34 U	0.58 UJNP	0.95 U	0.43 U
31300-FT	15 UJN	490	17 U	310	9.3 U	100 JN	26 UJNP	12 UJNP
31300-LV	1 UJNP	4.8 JNP	1.2 UJNP	3.5 I	0.66 U	1.1 UJNP	2.2 IJNP	0.83 U
31300-MS	0.89 UJNP	0.98 I	1 UJNP	0.77 I	0.56 U	0.96 UJNP	1.6 U	0.71 U
31300-SC	18 U	13 U	21 U	13 U	12 U	20 U	32 U	15 U
37177-BL	0.46 UJN	0.33 UJNP	0.52 U	0.32 U	0.29 UJNP	0.49 UJNP	0.8 UJN	0.36 U
37177-FT	4.6 U	3.3 UJNP	5.2 UJNP	3.2 UJNP	2.9 U	4.9 U	8 U	3.6 U
37177-LV	1.2 IJN	2 IJNP	1.1 UJNP	0.7 UP	0.64 U	1.1 U	1.8 UJNP	0.8 UJN
37177-MS	1.2 UJN	1.9 I	1.3 UJNP	0.82 UJNP	0.74 U	1.3 UJNP	2.1 UJNP	0.93 U
37177-SC	23 U	16 U	26 U	16 UJNP	14 UJNP	25 U	40 U	18 U
37194-BL	0.46 UJNP	0.33 U	0.52 UJNP	0.32 UP	0.29 UJNP	0.49 U	0.8 UJNP	0.36 U

Field ID	beta-BHC (ug/kg)	cis-nonachlor (ug/kg)	delta-BHC (ug/kg)	Dieldrin (ug/kg)	Endosulfan I (ug/kg)	Endosulfan II (ug/kg)	Endosulfan Sulfate (ug/kg)	Endrin (ug/kg)
37194-FT	15 U	91	17 UJNP	28 I	9.6 U	16 UJNP	27 UJNP	12 UJNP
37194-LV	1 UJNP	0.97 IJNP	1.1 UJNP	0.69 U	0.63 U	1.1 U	1.7 UJNP	0.79 UJNP
37194-MS	1.2 UJN	0.82 U	1.3 UJNP	0.8 U	0.72 U	1.2 U	2 U	0.91 U
37194-SC	31 U	22 UJNP	34 U	21 U	19 U	33 U	54 U	24 U
AP-07-108	1.4 UJN	11	1.6 UJNP	7 I	0.88 U	1.5 U	2.4 UJN	1.1 UJNP
AP-07-109 A	2.1 U	35	2.3 UJNP	150	1.3 U	2.9 IJNV	3.6 UJN	3.1 IJN
AP-07-109 B	1.2 U	17	1.4 UJNP	14	0.78 U	1.3 UJN	2.2 UJN	1.5 IJN
AP-07-110	1 U	18	1.1 UJN	11	0.64 U	1.1 U	1.8 UJN	0.8 UJNP
AP-07-111	7.3 UJNP	69	8.2 U	630	4.6 U	7.8 UJN	13 UJNP	5.8 UJNP
AP-07-112	1.2 U	24	1.4 U	7.6	0.76 U	1.3 UJNP	2.1 UJNP	0.99 IJNP
AP-07-113	21 UJNP	260	24 U	92 IP	13 U	23 UJNP	37 UJNP	17 UJNP
AP-07-114	6.8 U	84	7.6 U	59	4.3 U	8.6 IJNPV	12 UJN	13 IJN

Field ID	beta-BHC (ug/kg)	cis-nonachlor (ug/kg)	delta-BHC (ug/kg)	Dieldrin (ug/kg)	Endosulfan I (ug/kg)	Endosulfan II (ug/kg)	Endosulfan Sulfate (ug/kg)	Endrin (ug/kg)
AP-07-201	4.6 UJNP	55	5.2 UJ	78	2.9 UJ	4.9 UJNP	8 U	6.2 IJN
AP-07-202	13 UJNP	170	14 UJ	160 P	8 UJ	14 UJN	22 U	10 U
AP-07-203	1.8 UJNP	13	2 UJ	5.8 IP	1.1 UJ	1.9 UJNP	3.1 UJNP	1.4 U
AP-07-204	1.5 UJNP	9.7	1.7 UJ	3.9 I	0.97 UJ	1.7 UJNP	2.7 UJNP	1.2 UJNP
AP-07-301	1.4 UJNP	16	1.5 UJ	11	0.86 UJ	1.5 UJNP	2.4 UJN	1.5 IJNP
AP-07-303	1.8 UJNP	64	2.1 UJ	54	1.2 UJ	4.5 IJNV	5.2 IJN	9 IJN
AP-07-304	12 UJNP	83	13 UJ	210	7.6 UJ	13 UJNP	21 UJN	9.5 UJNP
AP-07-306	4.6 UJNP	38	5.2 UJ	260	2.9 UJ	4.9 UJNP	8 UJNP	3.6 UJNP
AP-07-307	29 UJNP	390	33 UJ	750	18 UJ	31 UJNP	51 U	23 UJNP
AP-07-308	22 U	260	25 U	470	14 U	80 IJNV	39 UJNP	17 U
AP-07-309	19 U	240	21 U	130	12 U	20 UJN	32 U	15 UJNP
AP-07-310	5.1 U	64	5.8 U	190	3.2 U	14 IJNPV	9 UJN	4.1 U

Field ID	beta-BHC (ug/kg)	cis-nonachlor (ug/kg)	delta-BHC (ug/kg)	Dieldrin (ug/kg)	Endosulfan I (ug/kg)	Endosulfan II (ug/kg)	Endosulfan Sulfate (ug/kg)	Endrin (ug/kg)
AP-07-311	1.1 U	16	1.2 UJNP	47	0.7 U	1.9 IJNPV	1.9 UJNP	1.7 IJNP
AP-07-312	22 U	170	25 U	1100	14 U	25 IJNV	39 U	18 UJNP
AP-07-313	33 UJNP	480	37 U	1900	21 U	55 IJNPV	58 UJN	30 IJNP
AP-07-401	12 UJNP	140	14 UJNP	67	7.6 UJ	13 UJ	21 U	9.6 U
AP-07-402	2.2 UJN	40	2.5 U	35	1.4 U	2.4 U	3.9 U	2.9 IJNP
AP-07-403	6.8 UJNP	63	7.6 U	41	4.3 U	7.3 UJNP	12 U	5.4 U
AP-07-404	1.2 UJNP	17	1.4 U	5.5 I	0.78 U	1.3 U	2.2 U	0.98 U
AP-07-405	32 UJNP	500	36 U	450	20 U	34 U	56 U	25 U
AP-07-406	2.4 UJNP	12	2.7 U	3.9 IP	5.2 IJN	2.6 UJN	4.2 U	1.9 U
AP-07-408	4.6 UJNP	41	5.2 U	110	2.9 U	4.9 U	8.1 U	3.7 U
ARA-07-10	12 U	240	13 U	220	18 IJNP	24 IJNP	21 U	27 IJN
ARA-07-101	18 U	310	21 UJNP	340	12 UJ	29 IJNV	32 U	16 IJNP

Field ID	beta-BHC (ug/kg)	cis-nonachlor (ug/kg)	delta-BHC (ug/kg)	Dieldrin (ug/kg)	Endosulfan I (ug/kg)	Endosulfan II (ug/kg)	Endosulfan Sulfate (ug/kg)	Endrin (ug/kg)
ARA-07-102	23 U	330	26 UJNP	560	15 UJ	63 IJNV	41 UJNP	26 IJNP
ARA-07-103	22 UJNP	220	25 UJ	390	14 UJ	46 IJNV	39 U	24 IJNP
ARA-07-104	8.1 UJN	170	9.1 UJ	200	5.1 UJ	17 IJNPV	14 U	7.2 IJNP
ARA-07-105	24 U	520	27 UJ	930	15 UJ	49 IJNPV	42 U	19 UJNP
ARA-07-106	23 U	400	26 UJ	580	14 UJ	58 IJNV	40 U	34 IJN
ARA-07-107	29 U	200	32 UJ	260	18 UJ	41 IJNV	50 U	23 UJNP
ARA-07-115	4.9 UJNP	67	5.5 UJN	51 P	3.1 U	5.2 UJN	8.6 UJNP	3.9 UJNP
ARA-07-116	6.6 U	32	7.4 U	240	4.1 U	7 UJNP	11 UJNP	5.2 UJNP
ARA-07-117	1.2 U	13	1.4 UJNP	8.6	0.77 U	1.3 U	2.1 UJN	0.97 UJNP
ARA-07-118	23 UJNP	840	26 UJNP	2700	14 U	150 JNV	40 UJNP	18 U
ARA-07-119	1.2 UJNP	40	1.4 UJNP	110 I	0.78 U	10 JNP	2.2 UJNP	0.98 U
ARA-07-120	82 U	620	92 U	120 IJNP	52 U	88 UJNP	140 U	65 U

Field ID	beta-BHC (ug/kg)	cis-nonachlor (ug/kg)	delta-BHC (ug/kg)	Dieldrin (ug/kg)	Endosulfan I (ug/kg)	Endosulfan II (ug/kg)	Endosulfan Sulfate (ug/kg)	Endrin (ug/kg)
ARA-07-123	9.5 U	55	11 U	34 I	6 U	10 UJNP	17 U	7.5 U
ARA-07-124	1.5 UJNP	28	1.7 U	51	0.96 U	1.6 U	2.7 UJNP	2.2 IJN
ARA-07-125	1 U	9.3	1.2 U	9.5	0.66 U	1.8 IJNP	1.8 UJN	1.1 IJNP
ARA-07-126	14 U	31 I	15 U	200	8.5 U	14 U	24 U	11 U
ARA-07-127	15 U	37 I	16 U	150	9.1 U	15 UJNP	25 U	11 U
ARA-07-128	12 U	49	13 U	330	7.3 U	12 UJNP	20 U	9.2 U
ARA-07-302	13 U	150	14 UJ	330	7.9 UJ	28 IJNV	22 UJNP	10 U
ARA-07-407	17 UJNP	55	19 UJN	150	11 U	18 U	29 U	13 UJNP
ARA-07-409	17 U	87	19 U	130	10 U	18 UJNP	29 U	13 UJNP
ARA-07-410	6 U	41	6.7 U	89	3.8 U	7.7 IJNP	10 U	4.7 UJNP
ARA-07-550	12 UJNP	180	14 U	200	7.7 U	15 IJN	21 UJNP	9.6 U
ARA-07-601	1.6 UJNP	1.3 I	1.8 U	3.6 I	1 U	1.7 UJN	2.8 U	1.3 U

Field ID	beta-BHC (ug/kg)	cis-nonachlor (ug/kg)	delta-BHC (ug/kg)	Dieldrin (ug/kg)	Endosulfan I (ug/kg)	Endosulfan II (ug/kg)	Endosulfan Sulfate (ug/kg)	Endrin (ug/kg)
ARA-07-602	2.1 UJNP	14	2.3 UJN	48	1.3 U	2.4 IJNP	3.7 U	1.7 UJNP
ARA-07-603	2.6 UJNP	3.8 IJNP	2.9 U	59	1.7 U	2.8 UJN	4.6 U	2.1 U
ARA-07-8	3.1 UJN	41	3.4 U	120	1.9 U	4.7 IJNP	5.4 UJN	2.4 U
ARA-07-9	6.1 U	130	6.9 U	160	3.9 U	16 IJNP	11 U	19 IJN
DU-NWC-07-06	0.55 IJNP	0.33 UJNP	0.55 IJN	0.32 U	0.29 U	0.49 U	0.8 U	0.72 IJNP
DU-NWC-07-07	0.72 IJNP	0.91 I	0.52 UJN	0.32 UJNP	0.29 U	0.49 U	0.8 UJNP	4.2 JN
DU-NWC-07-08	0.55 IJN	0.33 U	0.52 U	0.32 U	0.29 U	0.49 UJNP	0.8 U	3.2
DU-NWC-07-09	0.46 U	0.33 UJNP	0.52 UJ	0.32 UJNP	1.3 JN	0.49 UJN	0.8 U	2.2 IJN
DU-NWC-07-10	1.1 IJN	0.33 U	0.52 UJN	0.32 U	0.29 U	0.49 UJN	0.8 U	0.89 IJN
DU-NWC-07-11	0.8 IJN	0.33 U	0.52 UJNP	0.32 UJNP	0.44 IJN	0.49 UJNP	0.8 U	1.4 IJN
DU-NWC-07-12	1 IJN	0.33 U	0.52 UJNP	0.32 U	0.29 U	0.49 U	0.8 U	3.5 JN
DU-NWC-07-13	0.6 IJNP	0.33 U	0.52 UJNP	0.32 U	0.29 U	0.49 U	0.8 UJNP	0.59 IJNP

Field ID	beta-BHC (ug/kg)	cis-nonachlor (ug/kg)	delta-BHC (ug/kg)	Dieldrin (ug/kg)	Endosulfan I (ug/kg)	Endosulfan II (ug/kg)	Endosulfan Sulfate (ug/kg)	Endrin (ug/kg)
DU-NWC-07-14	0.46 UJN	0.33 U	0.52 UJNP	0.32 U	0.29 U	0.49 U	0.8 U	3.6 JN
DU-NWC-07-15	0.57 IJNP	0.33 U	0.52 UJNP	0.71 IJNP	0.29 U	0.62 IJN	0.8 U	2.3 IJNP
DU-NWC-07-16	0.88 IJN	0.33 U	0.52 UJNP	0.32 U	0.29 U	0.49 UJNP	0.8 U	1.6 IJNP
DU-NWC-07-17	0.83 IJNP	0.92 I	0.52 UJN	0.32 U	0.29 UJ	0.49 UJNP	0.8 U	3.9 JN
DU-NWC-07-18	0.92 UJNP	0.65 U	1 U	1.3 IJNP	0.93 IJNP	0.98 UJNP	1.6 U	0.73 UJNP
DU-NWC-07-19	0.92 U	0.65 U	1 UJNP	0.64 U	0.58 UJ	1.3 IJNPV	2.3 IJNP	3.4 IJN
DU-NWC-07-20	0.92 UJNP	0.65 U	1 UJNP	2.2 I	0.58 UJ	0.98 UJ	1.6 U	0.92 IJNP
DU-SEA-07-02	0.56 IJNP	0.33 U	0.52 UJNP	0.32 UJNP	0.29 U	0.49 U	0.8 UJNP	0.8 IJNP
DU-SEA-07-03	0.46 UJNP	0.33 UJNP	0.52 UJ	0.32 UJNP	0.29 UJNP	0.49 UJN	0.8 U	1.5 IJN
DU-SEA-07-04	0.59 UJN	0.42 U	0.67 UJNP	0.41 UJNP	0.37 U	0.63 U	1 U	2.6 IJN
DU-SEC-07-05	0.52 IJN	0.33 U	0.52 UJNP	0.32 U	0.29 U	0.49 U	0.8 UJNP	0.36 UJNP
DU-SWC-07-01	0.92 UJNP	0.65 UJNP	1 UJNP	2.4 I	0.58 U	0.98 UJNP	1.6 U	2.9 IJN

Field ID	beta-BHC (ug/kg)	cis-nonachlor (ug/kg)	delta-BHC (ug/kg)	Dieldrin (ug/kg)	Endosulfan I (ug/kg)	Endosulfan II (ug/kg)	Endosulfan Sulfate (ug/kg)	Endrin (ug/kg)
FWC13425H	2.6 U	26.7	2.8 UJNP	13.8 I	1.6 U	2.8 UJN	4.5 UJNP	2.1 U
FWC13564H	0.46 U	0.32 UJNP	0.5 U	1.4 I	0.29 U	0.49 UJN	0.8 UJNP	0.39 IJNP
FWC13671H	0.54 IJN	1.8	0.5 UJNP	1.2 IJNP	0.29 U	0.49 UJNP	0.8 UJNP	0.5 IJNP
FWC13810H	0.46 UJNP	2.3 JNP	0.68 IJN	14.9	0.29 U	2 IJN	2 IJN	0.36 UJNP
FWC13860H	0.66 UJNP	0.54 I	1.1 IJNP	1.8 I	0.42 U	0.71 UJNP	1.2 UJN	0.53 UJNP
FWC14584H	0.74 UJNP	2.8 JNP	1.1 IJN	25.1	0.47 U	1.3 IJN	1.3 UJNP	0.59 UJNP
FWC14616H	1.2 U	0.87 U	1.4 IJNP	1.6 IJNP	0.77 U	1.3 UJNP	2.1 UJNP	0.97 UJN
FWC14752H	0.46 UJNP	0.32 U	0.5 IJNP	1.3 I	0.29 U	0.49 U	0.8 UJN	0.4 IJN
FWC15173H	1.1 UJNP	1.5 IJNP	1.2 UJNP	14.2	0.69 U	1.2 UJNP	1.9 UJNP	0.87 UJNP
FWC15212H	0.46 UJN	2.9	0.97 IJNP	21.4	0.29 U	0.83 IJNP	0.8 UJNP	0.36 U
FWC15260H	2.3 UJNP	17.7	2.5 UJNP	11.4 I	1.4 U	2.4 UJNP	4 UJNP	1.8 U
FWC15388H	0.5 IJN	0.62 I	0.61 IJN	0.32 UJNP	0.29 U	0.49 UJNP	0.8 UJNP	0.36 UJNP

Field ID	beta-BHC (ug/kg)	cis-nonachlor (ug/kg)	delta-BHC (ug/kg)	Dieldrin (ug/kg)	Endosulfan I (ug/kg)	Endosulfan II (ug/kg)	Endosulfan Sulfate (ug/kg)	Endrin (ug/kg)
FWC15475H	0.71 UJNP	5.9	7.8 UJNP	5.5	0.45 UJNP	0.76 UJNP	1.2 IJN	2 IJN
FWC15602H	0.69 IJNP	2.5	0.5 UJNP	10.5	0.29 U	0.7 IJN	0.8 UJN	0.39 IJN
FWC15615H	0.46 UJNP	1.6 JNP	0.5 U	15.7	0.29 U	1 IJN	0.8 UJNP	0.36 U
FWC15731H	0.46 UJNP	1.2 JNP	0.5 U	9.9	0.29 U	0.79 IJNP	0.8 UJNP	0.36 U
FWC15736H	0.86 IJN	1.2 IJNP	0.67 U	12.9	0.39 U	0.84 IJN	1.1 UJNP	0.49 UJNP
FWC31201-WM-090408	1.9 UJNP	1 U	2 U	3.6 UP	1 U	0.95 U	1.7 UJNP	3.6 U
FWC31214-LK-090408	1.7 UJNP	0.92 U	1.9 U	3.3 U	0.95 U	0.88 U	1.6 U	3.3 U
FWC31215-WM-091708	1.9 UJNP	1 U	2.1 U	3.7 UJNP	1.1 U	0.98 UJNP	1.8 UJN	3.7 U
FWC31216-LK-090408	1.4 UJNP	0.85 IJN	1.5 U	2.7 UJN	0.77 U	0.71 UJNP	1.3 UJNP	2.7 U
FWC31217-WM-090408	1.9 UJNP	1 UJN	2 U	3.6 U	1 U	0.95 UJNP	1.7 U	3.6 U
FWC31803B	0.9 U	0.64 UJN	0.98 UJNP	1.4 I	0.57 U	0.96 U	1.6 U	0.72 U
FWC31803B	1.3 U	0.89 U	1.4 U	2 I	0.79 U	1.3 U	2.2 U	1 U

Field ID	beta-BHC (ug/kg)	cis-nonachlor (ug/kg)	delta-BHC (ug/kg)	Dieldrin (ug/kg)	Endosulfan I (ug/kg)	Endosulfan II (ug/kg)	Endosulfan Sulfate (ug/kg)	Endrin (ug/kg)
FWC31803B	1.5 U	1.1 U	1.7 U	2.2 IJNP	0.97 U	1.6 UJN	2.7 U	1.2 U
FWC31803B	1.7 U	1.2 U	1.8 U	3.4 I	1 U	1.8 U	2.9 U	1.3 UJNP
FWC31803F	36.9 U	262	40.2 U	1050	23.3 U	39.4 UJNP	64.3 U	29.3 UJNP
FWC31803L	5.5 UJN	23.7 JNP	6 U	57.6	3.5 U	5.8 IJNP	9.5 UJNP	4.3 UJNP
FWC31809B	0.69 U	0.49 UJNP	0.75 U	0.48 UJNP	0.44 UJNP	0.74 UJNP	1.2 UJN	0.55 UJNP
FWC31809B	0.86 U	0.61 UJNP	0.94 UJN	0.6 UJNP	0.54 UJNP	0.92 UJNP	1.5 U	0.68 UJNP
FWC31809B	0.89 U	0.63 U	0.96 U	0.62 U	0.56 UJNP	0.94 UJNP	1.5 U	0.7 UJNP
FWC31809B	0.97 U	0.68 U	1 U	0.67 U	0.61 UJNP	1 UJNP	1.7 U	0.77 U
FWC31809F	5.2 U	36.9 JNP	5.7 UJNP	41.2	3.3 U	5.6 UJN	9.1 UJNP	4.1 UJNP
FWC31809L	0.46 U	0.48 IJNP	0.5 UJNP	1.3 IJNP	0.29 U	0.49 UJNP	0.8 UJNP	0.36 UJN
FWC31811B	0.81 U	2.5 I	0.89 U	0.57 UJNP	0.51 U	0.87 UJNP	1.4 U	0.65 U
FWC31811B	1.1 U	2.5	1.2 UJNP	0.78 I	0.68 U	1.2 UJNP	1.9 U	0.86 UJNP

Field ID	beta-BHC (ug/kg)	cis-nonachlor (ug/kg)	delta-BHC (ug/kg)	Dieldrin (ug/kg)	Endosulfan I (ug/kg)	Endosulfan II (ug/kg)	Endosulfan Sulfate (ug/kg)	Endrin (ug/kg)
FWC31811B	1.2 U	2.8 I	1.3 UJN	0.88 I	0.76 U	1.3 UJNP	2.1 U	0.96 UJN
FWC31811B	1.3 U	3 I	1.4 UJNP	0.92 U	0.84 U	1.4 UJNP	2.3 UJNP	1.1 U
FWC31811F	70.8 U	3320 I	76.9 UJNP	201 I	44.6 U	75.4 U	123 UJNP	56.2 UJN
FWC31811L	4.6 UJNP	82.9	5 UJNP	5.8 IJNP	2.9 U	4.9 U	8 UJN	3.6 UJNP
FWC31813B	0.91 U	0.64 UJNP	0.99 UJNP	0.63 IP	0.57 UJNP	0.97 UJNP	1.6 UJNP	0.72 U
FWC31813B	1.2 U	0.87 UJNP	1.3 U	0.88 IP	0.78 UJNP	1.3 UJNP	2.1 U	0.98 U
FWC31813B	1.3 U	0.89 U	1.4 UJNP	0.88 UP	0.79 UJNP	1.3 UJNP	2.2 U	1 U
FWC31813B	1.3 U	0.9 UJNP	1.4 UJNP	0.89 UP	0.81 UJNP	1.4 UJNP	2.2 U	1 U
FWC31813F	10.1 U	66.9	11 U	99.2	6.4 U	40 IJN	17.5 UJNP	8 U
FWC31813L	0.89 U	12 JNP	0.97 U	2.2 I	0.56 U	0.95 U	3.8 IJN	0.71 U
FWC31822-U2W-040809	1.3 UJNP	0.71 UJN	9.3 JNP	2.6 U	0.74 U	0.68 U	1.2 U	2.6 U
FWC31828B	0.83 U	0.7 IJNP	0.91 U	0.84 IJNP	0.53 U	0.89 UJNP	1.5 U	0.66 UJNP

Field ID	beta-BHC (ug/kg)	cis-nonachlor (ug/kg)	delta-BHC (ug/kg)	Dieldrin (ug/kg)	Endosulfan I (ug/kg)	Endosulfan II (ug/kg)	Endosulfan Sulfate (ug/kg)	Endrin (ug/kg)
FWC31828B	1.1 U	0.79 I	1.2 U	0.91 IJNP	0.67 U	1.1 UJNP	1.8 U	0.84 U
FWC31828B	1.1 U	0.79 UJNP	1.2 UJNP	0.97 IJNP	0.7 U	1.2 UJNP	1.9 UJNP	0.88 U
FWC31828B	1.1 U	0.81 UJNP	1.2 UJNP	1.2 I	0.72 UJNP	1.2 UJNP	2 UJNP	0.91 UJNP
FWC31828F	35.7 UJNP	576	38.8 UJNP	270	22.5 U	38 U	62 UJN	28.3 UJNP
FWC31828L	1.8 UJN	20.6 JNP	2 UJNP	16.4	1.2 U	2 U	3.2 U	1.5 U
FWC31831B	0.81 U	0.57 UJNP	0.88 UJNP	0.65 IP	0.51 U	0.87 UJNP	1.4 UJNP	0.64 U
FWC31831B	0.89 U	0.63 U	0.97 U	0.86 IJNP	0.56 U	0.95 UJNP	1.6 U	0.71 U
FWC31831B	0.9 U	0.64 UJNP	0.98 U	0.92 I	0.57 U	0.96 UJNP	1.6 U	0.71 U
FWC31831B	0.9 U	0.64 UJNP	0.98 U	1.1 IP	0.57 UJNP	0.96 UJNP	1.6 U	0.72 U
FWC31831F	28.8 U	105 JNP	31.3 UJNP	318	18.2 U	50 IJN	50.2 U	22.9 UJNP
FWC31831L	0.92 U	3.8 JNP	1 UJ	9.1 J	0.58 UJ	0.98 U	2.9 IJNP	1.4 IJ, JN
FWC31832B	0.88 U	0.62 U	0.95 U	0.61 UP	0.55 UJNP	0.93 U	1.5 UJNP	0.7 U

Field ID	beta-BHC (ug/kg)	cis-nonachlor (ug/kg)	delta-BHC (ug/kg)	Dieldrin (ug/kg)	Endosulfan I (ug/kg)	Endosulfan II (ug/kg)	Endosulfan Sulfate (ug/kg)	Endrin (ug/kg)
FWC31832B	0.92 U	0.65 U	1 U	0.64 U	0.58 UJN	0.98 UJNP	1.6 UJNP	0.73 U
FWC31832B	0.93 U	0.66 U	1 U	0.65 U	0.59 U	0.99 U	1.6 U	0.74 U
FWC31832B	7.1 U	5 UJNP	7.7 U	4.9 UJNP	4.5 U	7.5 U	12.3 U	5.6 UJNP
FWC31832F	2.9 UJNP	25.7	3.2 U	27.6	1.9 U	5 IJNP	5.1 UJN	2.3 UJNP
FWC31832L	1.8 UJNP	29.2	2 IJNP	2.9 IJ, JNP	1.2 UJ	10 JN	6.4 IJNP	4 IJNP
FWC31835B	1.8 U	1.3 U	2 U	1.3 UJNP	1.1 U	1.9 U	3.2 U	1.4 U
FWC31835B	2 U	1.4 UJNP	2.1 UJNP	1.6 IJNP	1.2 U	2.1 UJNP	3.4 U	1.6 UJNP
FWC31835B	2.2 U	1.6 U	2.4 U	1.7 UJNP	1.4 U	2.3 U	3.8 U	1.7 U
FWC31835B	2.5 UJNP	1.7 UJNP	2.7 UJNP	4.2 I	1.6 UJN	2.6 U	4.3 U	2 U
FWC31835F	8.7 UJN	10.3 IJNP	9.5 UJNP	75.1	5.5 U	20.4 IJNP	15.2 UJNP	7.2 IJNP
FWC31835L	1.8 UJN	7.7 JNP	3.1 IJNP	31.4	1.2 U	10.1 JN	3.2 UJNP	1.7 IJN
FWC31838B	1.6 U	1.1 UJNP	1.8 U	1.1 UJNP	1 U	1.7 U	2.8 U	1.3 UJNP

Field ID	beta-BHC (ug/kg)	cis-nonachlor (ug/kg)	delta-BHC (ug/kg)	Dieldrin (ug/kg)	Endosulfan I (ug/kg)	Endosulfan II (ug/kg)	Endosulfan Sulfate (ug/kg)	Endrin (ug/kg)
FWC31838B	1.9 U	1.3 U	2 U	1.3 UJNP	1.2 U	2 UJNP	3.3 U	1.5 UJNP
FWC31838B	2 U	1.4 UJNP	2.1 U	1.4 UJNP	1.2 U	2.1 U	3.4 U	1.6 U
FWC31838B	2.1 U	1.5 UJNP	2.3 U	1.4 UJNP	1.3 U	2.2 U	3.6 U	1.6 UJNP
FWC31838F	5.2 IJN	63.7 JNP	5.4 UJNP	64.7 JNP	3.1 U	39.6 JNP	8.6 UJNP	3.9 U
FWC31838L	0.92 UJNP	15	1 UJNP	0.64 UJNP	0.58 U	1.2 IJNP	1.6 UJNP	0.73 U
FWC31839B	1.8 U	1.3 UJNP	2 U	1.3 UJNP	1.1 U	1.9 U	3.1 U	1.4 U
FWC31839B	1.8 U	1.3 UJNP	2 U	1.3 UJNP	1.1 U	1.9 UJNP	3.1 U	1.4 U
FWC31839B	2 U	1.4 U	2.2 U	1.4 UJNP	1.3 U	2.1 UJN	3.5 U	1.6 U
FWC31839B	2.2 U	1.6 UJNP	2.4 U	1.6 UJNP	1.4 U	2.4 U	3.9 U	1.8 U
FWC31839F	5.8 UJNP	208	6.3 UJN	196	3.6 U	67.3 JNP	10.1 UJNP	4.6 U
FWC31839L	1.8 U	3.9 IP	2 U	6.6 I	1.2 U	2.6 IJN	3.2 UJNP	1.5 U
FWC31842B	0.85 UJNP	0.6 UJNP	0.94 U	0.59 UJNP	0.54 U	0.9 UJNP	1.5 U	0.67 UJN

Field ID	beta-BHC (ug/kg)	cis-nonachlor (ug/kg)	delta-BHC (ug/kg)	Dieldrin (ug/kg)	Endosulfan I (ug/kg)	Endosulfan II (ug/kg)	Endosulfan Sulfate (ug/kg)	Endrin (ug/kg)
FWC31842B	0.86 UJ, JNP	0.61 U	0.99 UJNP	1.4 IJNP	0.55 U	0.92 UJNP	1.5 UJNP	0.69 U
FWC31842B	0.88 UJ, JNP	0.62 U	1.1 IJNP, Z2	1.8 IJNP	0.55 U	0.94 UJNP	1.5 U	0.7 U
FWC31842B	0.91 UJ	0.64 UJNP	1.2 IJNP	1.8 I	0.57 U	0.97 UJNP	1.6 U	0.72 U
FWC31842F	25.6 UJ, JN	291 Z2	27.8 UJNP	618	16.1 U	37.4 IJN	44.4 UJNP	20.3 UJNP
FWC31842L	4.6 UJ, JNP	24.4 JNP, Z2	5 UJNP	43.9	2.9 U	9 IJNP	8 U	3.6 UJNP
FWC31843B	0.9 U	0.64 UJN	0.98 U	0.63 UP	0.57 U	0.96 U	1.6 U	0.72 UJN
FWC31843B	1.3 UJNP	0.9 UJNP	1.4 U	0.89 UP	0.8 UJNP	1.4 UJNP	2.2 U	1 U
FWC31843B	1.3 U	0.95 UP	1.5 UJNP	0.93 UP	0.85 U	1.4 U	2.3 U	1.1 U
FWC31843B	1.4 U	0.97 UJNP	1.5 U	0.96 UP	0.87 U	1.5 U	2.4 U	1.1 U
FWC31843F	30 U	108	32.6 UJNP	261 P	18.9 U	31.9 UJN	52.1 UJN	23.8 U
FWC31843L	0.92 UJNP	2.5	1 U	7.2	0.58 U	1.2 IJN	1.6 UJNP	0.73 U
FWC31847B	0.86 U	1.2 I	0.94 U	4.9 I	0.54 U	0.92 UJNP	1.5 U	0.68 U

Field ID	beta-BHC (ug/kg)	cis-nonachlor (ug/kg)	delta-BHC (ug/kg)	Dieldrin (ug/kg)	Endosulfan I (ug/kg)	Endosulfan II (ug/kg)	Endosulfan Sulfate (ug/kg)	Endrin (ug/kg)
FWC31847B	0.97 U	1.3 I	1.1 UJNP	5.1	0.61 U	1 UJN	1.7 U	0.77 U
FWC31847B	1 U	1.5 I	1.1 UJNP	5.4	0.63 U	1.1 UJN	1.7 U	0.8 U
FWC31847B	20.4 UJN	177	22.2 U	734	12.9 U	62.2 IJNP	35.5 U	16.2 U
FWC31847F	109 U	430	118 UJNP	993 P	68.6 U	116 UJNP	189 U	86.4 U
FWC31847L	9.2 UJN	34.5	10 UJN	104	5.8 U	9.8 UJNP	16 U	7.3 U
FWC31851-LK-042209	1.7 UJNP	0.89 UJN	1.8 U	3.2 U	0.92 UJNP	0.84 U	1.5 U	3.2 U
FWC31863-LK-042209	1.3 UJNP	0.68 UJN	1.4 U	5	0.7 U	0.65 UJNP	1.2 U	2.4 U
FWC31891B	0.94 UJ	0.66 U	1 U	0.65 UJNP	0.59 U	1 UJNP	1.6 U	0.74 UJNP
FWC31891B	1 UJ, JNP	0.72 U	1.1 UJNP	0.71 UJNP	0.64 U	1.1 UJNP	1.8 U	0.81 UJNP
FWC31891B	1.2 UJ, JNP	0.84 UJNP	1.3 U	0.83 UJNP	0.75 U	1.3 UJNP	2.1 UJNP	0.95 U
FWC31891B	1.2 UJ, JNP	0.86 UJNP	1.3 UJN	0.85 UJNP	0.77 U	1.3 UJNP	2.1 U	0.97 U
FWC31891F	22.1 UJ, JN	151 Z2	24 UJNP	24.4 I	13.9 U	23.6 UJNP	38.5 UJN	17.5 U

Field ID	beta-BHC (ug/kg)	cis-nonachlor (ug/kg)	delta-BHC (ug/kg)	Dieldrin (ug/kg)	Endosulfan I (ug/kg)	Endosulfan II (ug/kg)	Endosulfan Sulfate (ug/kg)	Endrin (ug/kg)
FWC31891L	0.92 UJ, JNP	6.5 UJNP	1 UJNP	0.64 U	0.58 U	6 JNP	1.6 UJNP	0.73 UJNP
FWC31892-DU-092408	1.4 UJNP	0.75 UJNP	1.5 U	2.7 U	0.77 U	0.71 U	1.3 UJNP	2.7 U
FWC31896B	0.92 U	0.65 UJNP	1 U	0.64 UP	0.58 UJNP	0.98 U	1.6 U	0.73 U
FWC31896B	1.1 U	0.81 U	1.2 U	0.8 UP	0.72 U	1.2 U	2 U	0.91 U
FWC31896B	1.3 U	0.9 U	1.4 UJNP	0.89 UP	0.81 UJNP	1.4 U	2.2 U	1 U
FWC31896B	1.4 U	0.97 UJNP	1.5 U	2.8 I	0.86 U	1.5 UJNP	2.4 U	1.1 U
FWC31896F	21.6 UJN	75.8 P	23.5 U	34.2 I	13.6 U	23.1 UJNP	37.6 UJN	17.2 U
FWC31896L	0.46 U	1.7 JNP	0.5 UJNP	1 I	0.29 U	0.49 UJNP	0.8 UJN	0.36 UJNP
FWC31898B	0.0012 U	0.00088 UJNP	0.0014 UJNP	0.00087 U	0.00079 U	0.0013 U	0.0022 U	0.00099 U
FWC31898B	0.89 UJNP	0.64 U	0.97 U	0.62 UJNP	0.56 U	0.95 U	1.6 U	0.71 U
FWC31898B	0.9 UJNP	0.85 I	0.98 U	0.63 U	0.57 U	0.96 U	1.6 UJNP	0.72 U

Field ID	beta-BHC (ug/kg)	cis-nonachlor (ug/kg)	delta-BHC (ug/kg)	Dieldrin (ug/kg)	Endosulfan I (ug/kg)	Endosulfan II (ug/kg)	Endosulfan Sulfate (ug/kg)	Endrin (ug/kg)
FWC31898B	1 UJNP	1 I	1.1 IJNP	0.71 UJNP	0.64 U	1.1 U	1.8 U	0.81 U
FWC31898F	133 U	1410	145 UJNP	584 IJNP	84.1 U	142 U	232 UJNP	106 UJNP
FWC31898L	4.6 UJN	53.7	5 UJNP	11.1 IJNP	2.9 U	4.9 U	8 UJNP	3.6 UJNP
FWC31899B	0.87 U	0.61 U	1 IJNP	0.6 UJNP	0.55 UJNP	0.93 U	1.5 U	0.69 U
FWC31899B	1.2 U	0.86 UJNP	1.3 UJNP	0.84 UJNP	0.76 UJNP	1.3 U	2.1 U	0.96 U
FWC31899B	1.4 UJNP	0.99 U	1.5 UJNP	0.98 UJNP	0.89 UJNP	1.5 U	2.4 U	1.1 U
FWC31899B	1.5 U	1 UJNP	1.6 U	1 UJNP	0.93 UJNP	1.6 UJNP	2.6 U	1.2 UJNP
FWC31899F	13.6 UJNP	80.7 JNP	14.7 UJNP	60.6 I	8.6 U	14.5 UJNP	23.6 UJNP	10.8 U
FWC31899L	0.92 U	2 IJNP	1 UJNP	0.97 I	0.58 U	0.98 UJNP	1.6 UJNP	0.73 U
FWC32024-DU-042209	1.9 UJNP	1 UJNP	2.1 U	3.7 U	1.1 U	0.98 UJNP	1.8 UJNP	3.7 U
FWC32051-WM-091708	2.7 IJNP	1.1 UJN	2.2 U	3.8 U	1.1 U	1 U	1.8 UJNP	3.8 U
FWC32052-WM-091708	1.7 UJNP	0.89 UJN	1.8 U	3.2 U	0.92 U	0.84 U	1.5 U	3.2 U

Field ID	beta-BHC (ug/kg)	cis-nonachlor (ug/kg)	delta-BHC (ug/kg)	Dieldrin (ug/kg)	Endosulfan I (ug/kg)	Endosulfan II (ug/kg)	Endosulfan Sulfate (ug/kg)	Endrin (ug/kg)
FWC32053-WM-091708	1.8 IJNP	0.97 UJN	2 U	3.5 U	1 U	0.92 U	1.7 U	3.5 U
FWC32054-WM-091708	1.8 UJNP	0.97 UJN	2 U	3.5 U	1 U	0.92 U	1.7 U	3.5 U
FWC32055-WM-091708	1.8 UJNP	0.95 UJN	1.9 U	3.4 UP	0.98 U	0.9 U	1.6 U	3.4 U
FWC32056-WM-091708	1.8 U	0.95 U	1.9 U	3.4 U	0.98 U	0.9 UJNP	1.6 UJNP	3.4 U
FWC32057-WM-091708	1.9 UJNP	0.99 U	2 U	3.5 U	1 U	0.94 UJNP	1.7 U	3.5 U
FWC32058-WM-091708	1.7 UJNP	0.92 UP	1.9 U	3.3 U	0.95 U	0.88 U	1.6 U	3.3 U
FWC32059-WM-091708	1.9 U	1 U	2 UJNP	3.6 U	1 U	0.95 UJNP	1.7 U	3.6 U
FWC32060-WM-092408	1.9 UJNP	0.99 UP	2 U	3.5 U	1 U	0.94 U	1.7 U	3.5 U
FWC32061-WM-092408	2.5 IJNP, Z2	1 U	2 U	3.6 U	1 U	0.95 U	1.7 UJNP	3.6 U
FWC32062-WM-092408	1.9 UJNP	0.99 U	2 U	4.2 I	1 U	0.94 U	1.7 U	3.5 U
FWC32063-WM-092408	1.7 IJNP, Z2	0.81 U	1.6 U	4.4 IJNP	0.83 U	0.76 U	1.4 UJNP	2.9 U
FWC32064-WM-092408	1.8 UJNP	1.4 I	2 U	3.4 U	0.99 U	0.91 UJNP	1.6 UJN	3.4 U

Field ID	beta-BHC (ug/kg)	cis-nonachlor (ug/kg)	delta-BHC (ug/kg)	Dieldrin (ug/kg)	Endosulfan I (ug/kg)	Endosulfan II (ug/kg)	Endosulfan Sulfate (ug/kg)	Endrin (ug/kg)
FWC32065-DU-092408	1.8 UJNP	0.93 UJN	1.9 U	3.3 U	0.97 U	0.89 U	1.6 U	3.3 U
FWC32069-WM-040809	3.6 UJNP	1.9 UJNP	3.9 U	6.8 U	2 U	1.8 U	3.3 U	6.8 U
FWC32073-WM-040809	1.8 UJNP	0.95 UJN	1.9 U	3.4 UJNP	0.98 U	0.9 U	1.6 U	3.4 U
FWC32110-LK-032509	1.8 UJNP	0.93 UJN	1.9 U	3.3 U	0.97 U	0.89 U	1.6 U	3.3 U
FWC32119-LK-032509	1.4 UJNP	0.74 UJNP	1.5 U	2.6 U	0.76 U	0.7 U	1.3 U	2.6 U
FWC32125-DU-092408	1.6 U	0.84 UP	1.7 U	3 UP	0.87 U	0.8 U	1.4 U	3 U
FWC32126-DU-092408	1.8 UJNP	0.97 UJNP	2 U	3.5 UJNP	1 UJNP	0.92 U	1.7 U	3.5 U
FWC32129-U2W-040809	1.4 UJNP	0.75 UJN	1.5 U	2.7 U	0.78 U	0.72 U	1.3 U	2.7 U
FWC32136-LK-031609	1.4 UJNP	0.74 U	1.5 U	2.6 U	0.76 U	0.7 U	1.3 UJNP	2.6 U
FWC32142-DU-033109	1.4 U	0.77 UJNP	1.6 UJN	2.7 U	0.8 U	0.73 U	1.3 UJNP	2.7 U
FWC32145-DU-033109	1.5 U	0.81 UJNP	1.7 UJNP	2.9 U	0.84 U	0.77 UJN	1.4 UJNP	2.9 U
FWC32150-DU-033109	3.9 UJNP, Z2	2.1 U	4.3 UJNP	7.5 U	2.2 U	2 UJN	3.6 UJN	7.5 U

Field ID	beta-BHC (ug/kg)	cis-nonachlor (ug/kg)	delta-BHC (ug/kg)	Dieldrin (ug/kg)	Endosulfan I (ug/kg)	Endosulfan II (ug/kg)	Endosulfan Sulfate (ug/kg)	Endrin (ug/kg)
FWC32151-DU-033109	1.4 UJNP	0.73 UJNP	1.5 U	2.6 U	0.75 U	0.69 UJNP	1.2 U	2.6 U
FWC32152-LK-032509	1.3 U	0.67 UJNP	1.4 U	4.9	0.69 U	0.63 UJNP	1.1 U	2.4 U
FWC32153-U2W-040809	4.2 UJNP	2.3 UJNP	4.6 U	8.1 U	2.3 UJNP	2.1 UJNP	3.9 UJNP	8.1 UJNP
FWC32154-LK-031609	1.9 U	1 UJN	2 U	3.6 U	1 U	0.95 U	1.7 UJNP	3.6 U
FWC32157-LK-032509	1.2 UJNP	0.74 I	1.3 U	3.2 I	0.68 U	0.62 UJNP	1.1 UJN	2.3 U
FWC32158-LK-031709	10.6 JN P, Z2	0.93 UJNP	1.9 U	3.3 UJNP	0.97 UJNP	0.89 U	1.6 U	3.3 U
FWC32160-LK-033109	2.7 IJNP, Z2	1 UJNP	2 U	3.6 UP	1 U	0.95 U	1.7 UJNP	3.6 U
FWC32161-U2W-040809	7 JNP, Z2	0.73 U	1.5 UJNP	3.3 I	0.75 U	0.69 U	1.2 U	2.6 U
FWC32168-LK-041509	13.3 JN,P, Z2	1.3 U	2.6 U	4.6 U	1.3 U	1.2 U	2.2 U	4.6 U
FWC32169-DU-033109	9.1 JNP, Z2	1.1 UJNP	2.3 UJNP	4.1 U	1.2 U	1.1 UJN	2 UJNP	4.1 U
FWC32173-LK-031709	8.9 JNP, Z2	1.5 UJNP	3 U	5.3 U	1.5 U	1.4 U	2.5 UJNP	5.3 U

Field ID	beta-BHC (ug/kg)	cis-nonachlor (ug/kg)	delta-BHC (ug/kg)	Dieldrin (ug/kg)	Endosulfan I (ug/kg)	Endosulfan II (ug/kg)	Endosulfan Sulfate (ug/kg)	Endrin (ug/kg)
FWC32176-U2W-090408	6.3 JNP, Z2	0.99 U	2 U	3.5 U	1 UJNP	0.94 UJNP	1.7 U	3.5 U
FWC32177-U2W-090408	7.7 JNP, Z2	0.99 UJNP	2 U	3.5 U	1 U	0.94 U	1.7 U	3.5 U
FWC32178-U2W-090408	6.3 JNP, Z2	1.1 U	2.2 U	3.8 U	1.1 U	1 U	1.8 UJNP	3.8 U
FWC32180-U2W-090408	5 JNP, Z2	0.72 UJNP	1.5 UJNP	2.6 UJNP	0.75 U	0.69 U	1.2 UJNP	2.6 U
FWC32181-U2W-090408	6.5 JNP, Z2	0.82 UJNP	1.7 U	2.9 U	0.85 U	0.78 U	1.4 U	2.9 U
FWC32182-U2W-090408	3.6 JNP, Z2	0.71 UJNP	1.5 U	2.6 U	0.74 U	0.68 U	1.2 U	2.6 U
FWC32183-U2W-090408	3.6 JNP, Z2	0.96 UJNP	2 UJNP	4.7 I	0.99 U	0.91 U	1.6 U	3.4 U
FWC32184-U2W-090408	5.1 JNP, Z2	1 UJNP	2.1 U	3.6 U	1 U	0.96 UJNP	1.7 U	3.6 U
FWC32185-U2W-090408	5.6 JNP, Z2	0.9 U	1.8 U	3.2 U	0.93 U	0.85 UJNP	1.5 U	3.2 U
FWC32186-U2W-090408	4.8 JNP, Z2	0.71 U	1.5 IJNP	3.4 I	0.74 U	0.68 UJNP	1.2 U	2.6 U
FWC32187-U2W-090408	5.8 JNP, Z2	1 U	2.1 U	3.7 UJNP	1.1 U	0.98 UJNP	1.8 U	3.7 U
FWC32188-U2W-090408	1.7 U	0.92 UJNP	1.9 UJNP	3.3 U	0.95 U	0.88 U	1.6 UJN	3.3 U

Field ID	beta-BHC (ug/kg)	cis-nonachlor (ug/kg)	delta-BHC (ug/kg)	Dieldrin (ug/kg)	Endosulfan I (ug/kg)	Endosulfan II (ug/kg)	Endosulfan Sulfate (ug/kg)	Endrin (ug/kg)
FWC32189-U2W-090408	1.7 UJNP	0.92 U	1.9 U	3.8 I	0.95 U	0.88 UJNP	1.6 UJNP	3.3 U
FWC32190-U2W-090408	7.6 JNP	0.67 UJNP	1.4 U	2.4 U	0.7 U	0.64 UJNP	1.2 UJNP	2.4 U
FWC32191-U2W-090408	11 JN	1 U	2.1 U	3.7 U	1.1 U	0.99 U	1.8 UJNP	3.7 U
FWC32192-U2W-090408	13.6 JNP	1 UJNP	2.1 U	3.6 U	1 U	0.96 U	1.7 U	3.6 U
FWC32193-U2W-090408	2.3 IJNP	1 UJN	2.1 UJNP	3.7 U	1.1 U	0.99 U	1.8 UJNP	3.7 U
FWC32194-LK-032509	3.5 JNP	0.65 UJN	1.3 U	2.3 UJNP	0.68 U	0.62 U	1.1 U	2.3 U
FWC32195-LK-031609	11.2 JNP	0.84 U	1.7 U	3 U	0.87 U	0.8 U	1.4 U	3 U
FWC32198-LK-031609	9.6 JN	0.72 U	1.5 U	2.6 U	0.75 U	0.69 U	1.2 UJN	2.6 U
FWC32199-LK-032509	12.1 JNP	1 UJNP	2.1 U	3.6 U	1 U	0.96 U	1.7 U	3.6 U
FWC32200-LK-031609	7 JNP	0.75 UJN	1.5 U	7.3	0.77 U	0.71 UJNP	1.3 U	2.7 U
FWC32508-LK-101008	5.9 JNP	0.75 UJN	1.5 U	2.7 U	0.78 UJNP	0.72 U	1.3 U	2.7 U
FWC32750-LK-041509	1.9 UJNP	0.99 UJNP	2 UJNP	3.5 UP	1 U	0.94 U	1.7 UJNP	3.5 U

Field ID	beta-BHC (ug/kg)	cis-nonachlor (ug/kg)	delta-BHC (ug/kg)	Dieldrin (ug/kg)	Endosulfan I (ug/kg)	Endosulfan II (ug/kg)	Endosulfan Sulfate (ug/kg)	Endrin (ug/kg)
FWC32771-U2W-040809	13.5 JNP	1.3 UJNP	2.6 UJNP	4.5 UP	1.3 UJNP	1.2 U	2.2 U	4.5 U
FWC32776-LK-041509	7.6 JNP	0.7 UJNP	1.4 U	2.5 UP	0.72 U	0.67 U	1.2 UJNP	2.5 U
FWC32787-LK-041509	8.6 JNP	0.72 UJNP	1.5 U	2.6 U	0.75 U	0.69 U	1.2 UJNP	2.6 U
GFC 37192-FT	27 U	42 I	31 UJNP	1600	17 U	29 UJN	48 UJNP	22 UJNP
GFC 37192-SC	6.2 UJNP	4.4 UJNP	6.9 U	11 I	3.9 UJNP	6.6 UJNP	11 UJNP	4.9 U
GFC 37193-FT	21 UJN	360	24 UJNP	66 I	13 U	33 IJN	37 UJNP	17 U
GFC 37193-SC	3.9 UJNP	2.7 U	4.3 U	2.7 UJNP	2.4 U	4.1 U	6.8 U	3.1 U
LA-CI-07-01	0.46 U	0.33 UJNP	0.52 U	0.32 U	0.29 U	0.49 U	0.8 UJNP	0.45 IJN
LA-CI-07-02	0.46 U	0.33 UJN	0.52 U	0.32 UJNP	0.29 U	0.49 U	0.8 UJNP	0.8 IJN
LA-CI-07-03	0.46 U	1.2 IJNP	0.52 U	0.91 IJNP	0.29 U	0.49 UJN	0.8 UJNP	1.2 I
LA-CI-07-04	0.46 U	0.33 UJNP	0.52 U	0.32 U	0.29 U	0.49 UJNP	0.8 UJNP	0.36 UJNP
LA-CI-07-05	0.46 U	0.37 IJNP	0.52 U	0.32 U	0.29 U	0.49 U	0.8 UJNP	1.2 IJN

Field ID	beta-BHC (ug/kg)	cis-nonachlor (ug/kg)	delta-BHC (ug/kg)	Dieldrin (ug/kg)	Endosulfan I (ug/kg)	Endosulfan II (ug/kg)	Endosulfan Sulfate (ug/kg)	Endrin (ug/kg)
LA-CI-07-06	0.46 U	0.33 UJNP	0.52 U	0.32 UJNP	0.29 U	0.49 U	0.8 UJNP	1.6 IJN
LA-CI-07-07	0.46 U	0.33 UJNP	0.52 U	0.32 U	0.29 U	0.49 U	0.8 UJNP	0.36 UJN
LA-NE-07-08	0.92 UJNP	0.76 I	1 UJNP	0.76 IJNP	0.58 U	0.98 UJNP	1.6 U	1 IJN
LA-NE-07-09	0.92 UJNP	0.65 UJNP	1 U	0.7 I	0.58 U	0.98 U	1.6 U	0.73 UJNP
LA-NE-07-10	0.92 UJNP	0.65 UJNP	1.1 IJN	0.64 UJNP	0.58 U	0.98 UJNP	1.6 UJNP	1.3 IJN
LA-NE-07-11	0.92 UJNP	0.65 UJNP	1 UJNP	0.64 UJNP	0.58 U	0.98 U	1.6 UJNP	0.73 UJN
LA-NE-07-12	0.92 UJNP	0.68 I	1 UJNP	0.64 U	0.58 U	0.98 UJNP	1.6 U	2 IJNP
LA-NE-07-13	1.1 IJNP	0.65 UJNP	1 U	2.3 I	0.58 U	0.98 U	1.6 UJNP	0.73 UJN
LA-NE-07-14	0.92 U	0.65 U	1 UJNP	0.64 UJNP	0.86 IJNP	0.98 U	1.6 U	1.3 IJN
LA-NE-07-16	0.92 U	0.65 UJNP	1 U	1.1 I	0.58 U	0.98 U	1.6 UJNP	1.3 IJN
LA-NE-07-17	0.46 U	0.33 U	0.6 IJNP	0.32 U	0.45 IJNP	0.49 UJNP	0.8 UJNP	1.2 IJN
LA-NE-07-18	0.46 U	0.84 IJNP	0.52 UJNP	0.32 U	0.29 U	0.49 U	0.8 U	4.9 JN

Field ID	beta-BHC (ug/kg)	cis-nonachlor (ug/kg)	delta-BHC (ug/kg)	Dieldrin (ug/kg)	Endosulfan I (ug/kg)	Endosulfan II (ug/kg)	Endosulfan Sulfate (ug/kg)	Endrin (ug/kg)
LA-NE-07-19	0.46 UJNP	0.56 IJNP	0.52 U	0.32 UJNP	0.29 U	0.49 UJNP	0.8 U	5.2 JN
LA-NE-07-20	0.46 U	0.78 I	0.52 U	0.42 IJNP	0.29 U	0.49 UJN	0.8 U	3.5 JN
U2W-MC-07-02	0.5 UJNP	0.4 IJNP	0.56 U	0.35 U	0.31 U	0.53 U	0.87 U	1 IJN
U2W-MC-07-03	0.46 U	0.33 U	0.64 IJN	3.2	0.29 U	0.49 UJNP	0.8 U	2.9 JN
U2W-MC-07-04	0.89 UJNP	3.3	1 U	0.62 U	0.56 U	0.95 U	1.6 U	4 IJN
U2W-MC-07-05	0.46 UJNP	0.64 I	0.52 U	2.3 I	0.29 U	0.49 UJN	0.8 U	0.62 IJN
U2W-MC-07-06	0.46 U	0.66 IP	0.52 UJN	1.4 I	0.29 U	0.73 IJN	0.8 U	0.94 IJN
U2W-MC-07-07	0.46 U	0.33 U	0.52 UJN	0.37 I	0.29 U	0.49 UJN	0.8 U	0.92 IJN
U2W-MC-07-08	0.46 UJNP	0.33 U	0.52 U	0.32 UJNP	0.76 IJNP	0.49 UJN	0.8 U	1.7 IJN
U2W-MC-07-09	0.46 UJN	0.69 I	0.52 UJN	0.32 UJNP	1.7 JNP	0.49 UJNP	0.8 UJNP	0.61 IJNP
U2W-MC-07-10	0.46 UJNP	0.59 I	0.52 U	0.32 UJNP	0.29 U	0.49 UJN	0.8 U	0.87 IJNP
U2W-MC-07-11	0.46 UJNP	0.4 I	0.52 U	0.32 UJNP	0.29 U	0.49 UJNP	0.8 U	0.64 IJN

Field ID	beta-BHC (ug/kg)	cis-nonachlor (ug/kg)	delta-BHC (ug/kg)	Dieldrin (ug/kg)	Endosulfan I (ug/kg)	Endosulfan II (ug/kg)	Endosulfan Sulfate (ug/kg)	Endrin (ug/kg)
U2W-MC-07-12	0.46 U	0.55 IJNP	0.52 U	0.32 IJNP	0.29 U	0.49 UJNP	0.8 U	1.4 IJN
U2W-MC-07-13	0.88 IJN	0.43 IJNP	0.52 U	1.6 I	0.29 UJ	0.49 UJNP	0.8 U	1.3 IJN
U2W-MC-07-14	0.46 UJNP	0.63 IJNP	0.52 U	0.32 UJNP	0.29 U	0.49 UJN	0.8 U	1.6 IJN
U2W-MC-07-15	0.47 IJNP	0.37 I	0.52 U	1.3 IJNP	0.29 U	0.49 UJN	0.8 U	2.7 JN
U2W-MC-07-16	0.46 UJNP	0.7 I	0.52 U	0.56 IJNP	0.29 U	0.49 U	0.8 U	0.87 IJN
U2W-MC-07-17	0.46 UJNP	0.62 I	0.52 U	1.8 I	0.52 IJNP	0.79 IJNP	0.8 U	0.95 IJN
U2W-MC-07-18	0.46 UJNP	0.53 IJNP	0.52 U	0.8 I	0.29 U	0.49 UJN	0.8 U	0.47 IJN
U2W-MC-07-19	0.46 UJNP	1 I	0.52 U	0.64 IJNP	0.29 U	0.49 U	0.8 UJNP	0.89 IJNP
U2W-MC-07-20	0.46 UJNP	0.4 IJNP	0.52 U	1.1 I	0.29 U	0.49 UJN	0.8 U	0.56 IJN
U2W-RC-07-01	2 U	1.4 U	2.3 UJN	1.4 U	1.3 U	2.2 UJN	3.5 U	8.6 IJN
WM-G-07-01	0.46 UJNP	0.34 IJNP	0.52 UJ	0.46 IJNP	0.29 U	0.49 U	0.8 U	1.3 IJN
WM-G-07-02	0.46 U	0.41 IJNP	0.52 U	0.4 IJNP	0.29 U	0.49 U	0.8 UJNP	0.69 IJN

Field ID	beta-BHC (ug/kg)	cis-nonachlor (ug/kg)	delta-BHC (ug/kg)	Dieldrin (ug/kg)	Endosulfan I (ug/kg)	Endosulfan II (ug/kg)	Endosulfan Sulfate (ug/kg)	Endrin (ug/kg)
WM-G-07-03	0.46 U	0.38 IJNP	0.52 U	0.93 I	0.29 U	0.49 U	0.8 UJNP	1.7 IJNP
WM-G-07-04	0.46 U	0.33 UJNP	0.52 U	0.36 IJNP	0.29 U	0.49 U	0.8 UJN	0.36 UJNP
WM-G-07-05	0.46 U	0.5 IJN	0.52 U	0.55 IJNP	0.29 U	0.49 U	0.8 UJNP	0.68 IJNP
WM-G-07-06	0.46 U	0.33 UJNP	0.52 U	0.32 UJNP	0.29 U	0.49 UJNP	0.8 U	0.52 IJN
WM-G-07-07	0.46 U	0.33 UJNP	0.52 U	0.32 UJNP	0.58 I	0.49 U	0.8 U	0.36 UJN
WM-G-07-08	0.46 U	0.33 UJNP	0.52 U	0.7 IJNP	0.29 U	0.49 U	0.9 IJN	1.2 IJN
WM-G-07-09	0.46 U	0.33 UJNP	0.52 U	0.43 IJNP	0.29 U	0.49 U	0.8 UJNP	0.44 IJNP
WM-G-07-10	0.46 U	0.33 UJNP	0.52 U	0.8 IJNP	0.29 U	0.49 U	0.8 U	0.52 IJNP
WM-G-07-11	0.46 U	0.33 UJN	0.52 U	0.32 UJNP	0.29 U	0.49 U	0.8 U	1 I
WM-G-07-12	1.8 IJN	0.65 U	1 U	0.64 U	0.58 U	0.98 U	1.6 U	1.1 IJNP
WM-G-07-13	0.92 UJNP	0.65 U	1 UJN	0.64 UJNP	0.58 U	0.98 UJNP	1.6 U	1.9 I
WM-G-07-14	0.92 U	0.65 U	1 UJNP	2.5 I	0.58 U	0.98 U	1.6 UJNP	0.84 IJN

Field ID	beta-BHC (ug/kg)	cis-nonachlor (ug/kg)	delta-BHC (ug/kg)	Dieldrin (ug/kg)	Endosulfan I (ug/kg)	Endosulfan II (ug/kg)	Endosulfan Sulfate (ug/kg)	Endrin (ug/kg)
WM-G-07-15	1.6 IJN	0.65 U	1 UJNP	1.5 IJNP	0.58 U	0.98 UJNP	1.6 UJNP	0.73 UJNP
WM-G-07-16	0.92 UJNP	0.65 UJNP	1 U	0.84 I	0.58 U	0.98 UJNP	1.6 UJN	0.82 IJN
WM-G-07-17	1.5 IJNP	0.65 UJNP	1 U	2 I	0.58 U	0.98 UJN	1.6 UJNP	0.73 UJNP
WM-G-07-18	0.92 UJNP	0.65 U	1 U	2.2 I	0.58 U	0.98 UJN	1.6 UJNP	2.1 IJN
WM-G-07-19	0.92 UJNP	0.65 U	1 UJNP	0.81 IJNP	0.58 U	0.98 UJN	1.6 UJNP	0.99 IJN
WM-G-07-20	0.92 UJNP	0.65 U	1 U	0.64 UJNP	0.58 U	0.98 U	1.6 U	4.2 IJN
ZNWA PIGFROG1	0.46 U	0.35 IJNP	0.5 U	0.42 IJNP	0.29 U	0.49 UJNP	0.8 UJNP	0.36 UJNP
ZNWA PIGFROG2	0.46 U	0.32 UJNP	0.5 U	0.37 I	0.29 U	0.49 UJNP	0.8 UJN	0.36 UJNP
ZNWB PIGFROG1	0.46 U	0.32 UJNP	0.5 U	0.32 UJNP	0.29 U	0.49 UJNP	0.8 U	0.94 IJN
ZNWB PIGFROG2	0.46 U	0.32 UJNP	0.5 U	0.32 UJNP	0.29 U	0.49 UJNP	0.8 U	0.36 U
ZNWC PIGFROG1	0.46 U	0.43 IJNP	0.5 U	1.5 IJNP	0.29 U	0.49 UJNP	0.8 UJNP	0.36 U
ZNWC PIGFROG2	0.46 U	0.59 IJNP	0.5 U	4.9	0.29 U	0.49 UJNP	0.8 U	0.36 U

Field ID	beta-BHC (ug/kg)	cis-nonachlor (ug/kg)	delta-BHC (ug/kg)	Dieldrin (ug/kg)	Endosulfan I (ug/kg)	Endosulfan II (ug/kg)	Endosulfan Sulfate (ug/kg)	Endrin (ug/kg)
ZSWA PIGFROG1	0.46 U	0.32 UJNP	0.5 U	0.92 IJNP	0.29 U	0.49 UJNP	0.8 UJNP	0.36 U
ZSWA PIGFROG2	0.46 U	0.32 UJNP	0.5 U	1 IJNP	0.29 U	0.49 UJNP	0.8 UJNP	0.36 U
ZSWA PIGFROG3	0.46 U	0.33 I	0.5 U	0.32 U	0.29 U	0.49 UJ, JN	0.8 UJNP	0.36 U
ZSWC PIGFROG1	0.46 U	2.4	0.5 U	5.7 P	0.29 U	0.49 UJNP	0.8 U	0.36 U
ZSWC PIGFROG2	0.46 U	2 JNP	0.5 U	6.4	0.29 U	0.49 UJNP	0.8 UJNP	0.36 U
ZSWC PIGFROG3	0.46 U	1.5	0.52 IJN	4.8	0.29 U	0.49 UJNP	1 IJNP	0.36 U

Appendix G-3: Analysis data for OCP sample collections from Lake Apopka and the NSRA in 2007. Results from OCP analysis showing Endrin Aldehyde, Endrin Ketone, gamma-BHC, gamma-Chlordane, Heptachlor, Hepachlor Epoxide, and Methoxychlor. Comment codes are defined at the end of this appendix.

Field ID	Endrin Aldehyde (ug/kg)	Endrin Ketone (ug/kg)	gamma-BHC (Lindane) (ug/kg)	gamma-Chlordane (ug/kg)	Heptachlor (ug/kg)	Heptachlor Epoxide (ug/kg)	Methoxychlor (ug/kg)
31203-FT	88 UJN	37 UJNP	17 UJNP	45 U	22 UJNP	63 IJNP	110 UJNP
31203-SC	26 U	11 UJNP	5 U	14 U	6.6 U	7.2 U	34 U
31206-FT	360 UJNP	150 UJNP	68 UJNP	190 U	90 U	97 UJNP	470 U
31206-SC	28 U	12 UJNP	5.3 U	14 U	7 U	7.6 U	36 U
31224-BL	2.7 UJ	1.2 UJNP	0.51 U	1.4 U	0.68 U	0.74 U	3.5 UJNP
31224-FT	92 UJ	39 UJNP	17 U	48 U	23 U	25 U	120 UJNP
31224-LV	3.3 UJ	1.7 IJNP	0.63 U	1.7 UJNP	0.83 U	0.9 U	4.3 U
31224-MS	3.6 UJ	1.5 UJNP	0.68 U	1.9 U	0.91 U	0.98 U	4.7 U
31224-SC	19 UJNP	13 IJNP	3.6 UJNP	9.8 U	4.8 UJNP	5.2 UJNP	25 UJNP
31225-BL	1.4 UJ	0.61 UJNP	0.27 UJNP	1 IJNP	0.36 U	0.39 U	1.9 UJN

Field ID	Endrin Aldehyde (ug/kg)	Endrin Ketone (ug/kg)	gamma-BHC (Lindane) (ug/kg)	gamma-Chlordane (ug/kg)	Heptachlor (ug/kg)	Heptachlor Epoxide (ug/kg)	Methoxychlor (ug/kg)
31225-FT	240 UJ	100 UJNP	45 UJNP	320 JNP	60 U	64 U	310 UJNP
31225-LV	12 UJ	5.1 UJNP	2.3 UJNP	13 JNP	3 U	3.3 U	16 U
31225-MS	4.3 UJNP	1.8 U	0.8 UJN	4.9 JNP	1.1 U	1.2 U	5.6 UJNP
31225-SC	32 UJNP	14 U	6 UJNP	16 UJNP	7.9 UJNP	8.6 U	41 UJNP
31225-ST	4.3 U	1.8 U	0.81 U	2.2 UJ	1.1 U	5.1 JNP	5.6 UJNP
31297-FT	16 IJNP	4.6 UJNP	2 UJN	6.4 I	2.7 UJNP	3.5 IJNP	14 UJNP
31297-SC	70 U	30 UJNP	13 U	36 U	17 U	19 U	91 UJNP
31298-FT	17 JN	2 UJNP	0.9 U	2.5 U	1.2 UJNP	6.8 JNP	6.2 UJNP
31298-SC	22 UJNP	9.5 UJNP	4.2 U	11 U	5.5 U	6 U	29 UJNP
31299-BL	1.4 UJ	0.61 UJN	0.27 UJNP	0.74 U	0.36 U	0.39 U	1.9 UJNP
31299-FT	55 UJNP	23 UJNP	10 UJN	78 JNP	14 U	15 U	72 UJNP
31299-LV	9.3 JN	2.1 IJN	0.71 UJNP	3 IJNP	0.94 U	1 U	5.3 IJNV

Field ID	Endrin Aldehyde (ug/kg)	Endrin Ketone (ug/kg)	gamma-BHC (Lindane) (ug/kg)	gamma-Chlordane (ug/kg)	Heptachlor (ug/kg)	Heptachlor Epoxide (ug/kg)	Methoxychlor (ug/kg)
31299-MS	6.9 UJNP	3 UJN	1.3 UJNP	7.4 JNP	1.7 U	1.9 U	9 UJNP
31299-SC	22 UJNP	9.4 U	4.1 U	11 UJNP	5.5 U	6 U	29 U
31300-BL	1.7 U	0.72 U	0.32 UJNP	0.87 U	0.42 U	0.46 U	2.2 U
31300-FT	46 U	20 UJN	8.7 UJ	24 U	12 U	75 JNP	60 UJNP
31300-LV	3.3 UJNP	1.4 U	0.61 UJ	1.7 U	0.81 UJNP	0.88 UJNP	4.2 UJNP
31300-MS	2.8 U	1.2 U	0.52 UJNP	1.4 U	0.69 U	0.75 U	3.6 UJNP
31300-SC	57 UJNP	24 U	11 UJN	30 UJNP	14 U	15 UJNP	74 U
37177-BL	1.4 U	0.61 U	0.27 UJN	0.74 U	0.36 UJNP	0.39 UJNP	1.9 U
37177-FT	14 UJN	6.1 U	2.7 UJNP	7.4 U	3.6 UJNP	3.9 UJNP	19 UJNP
37177-LV	3.1 U	1.3 U	0.59 UJN	1.6 U	0.79 UJNP	0.85 UJNP	4.1 U
37177-MS	3.7 UJNP	1.6 UJNP	0.69 UJNP	1.9 U	0.92 U	0.99 UJNP	4.8 UJNP
37177-SC	72 UJNP	31 U	13 UJ	37 UJNP	18 UJNP	19 UJNP	93 UJNP

Field ID	Endrin Aldehyde (ug/kg)	Endrin Ketone (ug/kg)	gamma-BHC (Lindane) (ug/kg)	gamma-Chlordane (ug/kg)	Heptachlor (ug/kg)	Heptachlor Epoxide (ug/kg)	Methoxychlor (ug/kg)
37194-BL	1.4 U	0.61 UJNP	0.27 UJNP	0.74 U	0.36 U	0.39 U	1.9 U
37194-FT	48 UJNP	20 UJNP	9 UJNP	25 U	12 U	13 UJNP	62 UJNP
37194-LV	3.1 UJNP	1.3 UJNP	0.59 UJNP	1.6 U	0.78 UJNP	0.84 UJNP	4 UJNP
37194-MS	3.6 U	1.5 U	0.67 UJNP	1.8 U	0.89 U	0.97 U	4.7 U
37194-SC	95 UJN	41 U	18 UJ	49 UJNP	24 U	26 U	120 UJNP
AP-07-108	4.3 UJNP	1.9 UJNP	0.82 UJNP	2.2 UJNP	1.1 UJNP	1.2 UJNP	5.6 UJNP
AP-07-109 A	6.4 UJNP	2.7 U	1.2 UJNP	3.3 U	1.6 UJNP	4.9 IJNP	8.3 U
AP-07-109 B	3.9 UJN	1.7 UJNP	0.73 UJNP	2 UJNP	0.97 U	2.6 IJNP	5 UJNP
AP-07-110	3.2 IJN	1.4 UJNP	0.6 UJNP	1.6 UJNP	0.79 U	2.5 IJNP	4.1 UJNP
AP-07-111	23 UJN	9.7 UJNP	4.3 U	12 U	5.7 U	11 IJNP	30 UJNP
AP-07-112	5.4 IJN	1.6 UJNP	0.71 U	1.9 UJNP	0.94 UJNP	1.6 IJNP	4.9 UJNP
AP-07-113	66 UJN	28 UJNP	12 U	34 U	17 U	35 IJNP	86 UJN

Field ID	Endrin Aldehyde (ug/kg)	Endrin Ketone (ug/kg)	gamma-BHC (Lindane) (ug/kg)	gamma-Chlordane (ug/kg)	Heptachlor (ug/kg)	Heptachlor Epoxide (ug/kg)	Methoxychlor (ug/kg)
AP-07-114	21 UJNP	9 U	4 U	11 U	5.3 U	18 IJNP	27 UJNP
AP-07-201	14 UJN	6.1 UJNP	2.7 UJ	7.4 UJ	3.6 UJNP	5.2 IJNP	19 UJNP
AP-07-202	40 UJNP	17 UJNP	7.5 UJ	20 UJ	9.9 U	20 IJNP	52 UJNP
AP-07-203	5.6 UJN	2.4 UJNP	1 UJNP	2.9 UJ	1.4 UJNP	1.5 UJNP	7.2 UJNP
AP-07-204	4.8 UJN	2.9 IJN	0.91 UJ	2.5 UJ	1.2 UJNP	1.3 UJNP	6.3 UJNP
AP-07-301	4.3 UJNP	1.8 UJNP	0.8 UJ	2.2 UJNP	1.1 U	1.2 UJNP	5.6 UJNP
AP-07-303	14 JN	2.4 UJNP	1.1 UJ	3 UJ	1.4 UJNP	5.6 JNP	7.4 UJNP
AP-07-304	37 UJNP	16 UJNP	7 UJ	19 UJ	9.4 U	15 IJNP	49 UJNP
AP-07-306	14 UJNP	6.1 UJNP	2.7 UJ	7.4 UJ	3.6 UJNP	7.7 IJNP	19 UJNP
AP-07-307	91 UJNP	39 UJNP	17 UJ	72 IJNP	23 U	41 IJNP	120 UJNP
AP-07-308	140 JN	29 UJNP	13 U	35 U	17 UJN	66 JNP	89 UJNP
AP-07-309	58 UJN	25 UJNP	11 U	30 U	14 U	16 UJNP	75 UJNP

Field ID	Endrin Aldehyde (ug/kg)	Endrin Ketone (ug/kg)	gamma-BHC (Lindane) (ug/kg)	gamma-Chlordane (ug/kg)	Heptachlor (ug/kg)	Heptachlor Epoxide (ug/kg)	Methoxychlor (ug/kg)
AP-07-310	26 IJN	6.8 UJNP	3 UJN	8.2 UJNP	4 U	13 IJNP	21 UJN
AP-07-311	3.4 UJNP	1.5 UJNP	0.65 UJN	1.8 U	0.86 UJN	3.2 JNP	4.5 UJNP
AP-07-312	69 UJN	29 UJNP	13 U	36 U	17 U	38 IJNP	90 UJNP
AP-07-313	100 UJNP	44 UJNP	19 U	53 U	26 UJNP	65 IJNP	130 U
AP-07-401	38 UJNP	16 UJNP	7.1 UJ	19 UJNP	9.4 U	10 UJNP	49 UJNP
AP-07-402	7.1 IJNP	2.9 UJNP	1.3 U	3.5 U	1.7 UJN	8.2 JNP	8.9 UJNP
AP-07-403	21 UJNP	9.1 UJNP	4 U	11 U	5.3 U	6.7 IJNP	28 UJNP
AP-07-404	3.8 UJNP	1.6 UJNP	0.72 U	2 U	0.96 U	1 UJNP	5 UJNP
AP-07-405	100 UJNP	42 UJNP	19 U	51 U	25 U	34 IJNP	130 UJNP
AP-07-406	7.5 UJNP	3.3 IJN	1.4 U	3.9 U	1.9 U	2 UJNP	9.8 UJNP
AP-07-408	14 UJNP	6.1 UJNP	2.7 U	7.4 U	3.6 U	4.7 IJNP	19 UJN
ARA-07-10	37 UJN	16 UJN	6.9 UJNP	92 JNP	9.2 U	32 IJNP	48 UJNP

Field ID	Endrin Aldehyde (ug/kg)	Endrin Ketone (ug/kg)	gamma-BHC (Lindane) (ug/kg)	gamma-Chlordane (ug/kg)	Heptachlor (ug/kg)	Heptachlor Epoxide (ug/kg)	Methoxychlor (ug/kg)
ARA-07-101	57 UJN	24 UJN	11 UJNP	64 JNP	14 U	46 IJNP	74 UJNP
ARA-07-102	73 UJN	31 UJNP	14 UJ	94 JNP	18 U	55 IJNP	95 UJNP
ARA-07-103	70 UJN	30 UJNP	13 UJNP	87 JNP	17 UJNP	45 IJNP	91 UJNP
ARA-07-104	25 UJN	11 UJNP	4.8 UJNP	48 JNP	6.3 U	22 IJNP	33 UJNP
ARA-07-105	75 UJN	32 UJNP	14 UJ	87 JNP	19 UJNP	56 IJNP	98 UJNP
ARA-07-106	71 UJNP	30 UJN	13 UJNP	65 JNP	18 UJN	53 IJNP	92 UJNP
ARA-07-107	89 UJNP	38 UJNP	17 UJ	65 IJNP	22 U	39 IJNP	120 UJNP
ARA-07-115	15 UJN	6.5 U	2.9 U	7.8 UJNP	3.8 U	10 IJNP	20 UJN
ARA-07-116	20 UJN	8.7 U	3.8 U	11 U	5.1 U	13 IJNP	27 UJNP
ARA-07-117	3.8 UJNP	1.6 UJNP	0.72 UJNP	2 U	0.95 UJNP	2.6 IJNP	5 U
ARA-07-118	390 JN	31 UJNP	13 U	37 U	18 UJNP	160 JNP	93 UJNP
ARA-07-119	3.9 U	1.7 UJNP	0.73 U	2 U	0.97 U	13 JN	5 UJNP

Field ID	Endrin Aldehyde (ug/kg)	Endrin Ketone (ug/kg)	gamma-BHC (Lindane) (ug/kg)	gamma-Chlordane (ug/kg)	Heptachlor (ug/kg)	Heptachlor Epoxide (ug/kg)	Methoxychlor (ug/kg)
ARA-07-120	260 UJNP	110 UJNP	48 U	130 UJNP	64 U	69 UJNP	330 UJNP
ARA-07-123	30 UJNP	13 UJNP	5.6 UJNP	15 U	7.4 U	8 UJNP	39 UJNP
ARA-07-124	9.2 JN	2 UJNP	0.89 U	2.4 U	1.2 U	3.9 IJNP	6.2 UJNP
ARA-07-125	4.5 IJN	1.4 UJNP	0.61 UJNP	1.7 U	0.81 U	1.2 IJNP	4.2 UJNP
ARA-07-126	42 UJN	18 UJNP	7.9 U	22 U	11 U	11 UJNP	55 U
ARA-07-127	45 UJN	19 UJN	8.5 U	23 U	11 U	12 UJNP	59 UJN
ARA-07-128	36 UJN	15 UJNP	6.8 UJNP	19 U	9.1 U	9.8 UJNP	47 UJNP
ARA-07-302	39 UJN	17 UJNP	7.4 UJ	20 UJ	9.8 U	29 IJNP	51 UJNP
ARA-07-407	52 UJN	22 UJN	9.8 UJNP	35 IJNP	13 U	23 IJNP	68 UJNP
ARA-07-409	52 UJN	22 UJNP	9.7 UJNP	27 UJNP	13 U	14 UJNP	67 UJNP
ARA-07-410	19 UJN	7.9 UJN	3.5 UJNP	9.6 UJNP	4.6 UJNP	11 IJNP	24 UJNP
ARA-07-550	39 IJN	16 UJNP	7.1 UJNP	20 U	9.5 U	23 IJNP	49 UJN

Field ID	Endrin Aldehyde (ug/kg)	Endrin Ketone (ug/kg)	gamma-BHC (Lindane) (ug/kg)	gamma-Chlordane (ug/kg)	Heptachlor (ug/kg)	Heptachlor Epoxide (ug/kg)	Methoxychlor (ug/kg)
ARA-07-601	5.1 UJN	2.2 UJNP	0.95 U	2.6 UJNP	1.3 UJNP	1.4 UJNP	6.6 UJNP
ARA-07-602	6.5 UJNP	2.8 UJNP	1.2 U	3.4 UJNP	1.6 U	3.2 IJNP	8.5 UJNP
ARA-07-603	8.2 UJNP	3.5 UJNP	1.5 U	4.5 I	2 U	2.4 IJNP	11 UJNP
ARA-07-8	19 JN	4.1 UJNP	1.8 U	12 JNP	2.4 U	5.2 IJNP	12 UJNP
ARA-07-9	19 UJN	8.1 UJN	3.6 UJN	37 JNP	4.8 U	21 JNP	25 UJN
DU-NWC-07-06	1.4 UJNP	0.61 UJN	0.27 U	0.74 UJNP	0.36 U	0.39 U	1.9 UJNP
DU-NWC-07-07	1.4 UJNP	0.61 UJNP	0.27 U	0.74 UJNP	0.36 UJNP	0.39 U	1.9 U
DU-NWC-07-08	1.4 UJNP	0.61 UJNP	0.27 U	0.74 U	0.36 UJNP	0.39 U	1.9 UJN
DU-NWC-07-09	1.4 UJNP	0.61 UJNP	0.27 U	0.74 U	1.1 IJNP	0.39 U	1.9 UJNP
DU-NWC-07-10	1.4 UJNP	0.61 UJN	0.27 U	0.74 UJNP	0.36 UJNP	0.39 UJNP	1.9 UJNP
DU-NWC-07-11	1.4 U	0.61 UJNP	0.27 U	0.74 UJNP	0.36 UJN	0.39 UJNP	1.9 UJNP
DU-NWC-07-12	1.4 UJNP	0.61 UJNP	0.27 U	0.74 U	0.36 UJN	0.39 UJNP	1.9 UJNP

Field ID	Endrin Aldehyde (ug/kg)	Endrin Ketone (ug/kg)	gamma-BHC (Lindane) (ug/kg)	gamma-Chlordane (ug/kg)	Heptachlor (ug/kg)	Heptachlor Epoxide (ug/kg)	Methoxychlor (ug/kg)
DU-NWC-07-13	1.4 UJNP	0.61 UJN	0.27 U	0.74 U	0.36 U	0.39 U	1.9 UJNP
DU-NWC-07-14	1.4 UJNP	0.61 UJN	0.27 UJNP	0.74 U	0.36 UJNP	0.39 U	1.9 UJNP
DU-NWC-07-15	1.4 UJNP	0.61 UJN	0.27 U	0.74 UJNP	0.36 U	0.39 U	1.9 UJNP
DU-NWC-07-16	1.4 UJNP	0.61 UJNP	0.27 U	0.74 UJNP	0.36 UJNP	0.39 U	1.9 UJNP
DU-NWC-07-17	1.4 UJNP	0.61 UJN	0.27 U	0.74 UJNP	0.36 UJNP	0.39 UJNP	1.9 U
DU-NWC-07-18	2.9 UJNP	1.2 UJN	0.82 IJN	1.5 UJNP	0.94 IJNP	0.77 U	3.7 UJNP
DU-NWC-07-19	2.9 UJNP	1.3 IJNP	0.54 U	1.5 UJNP	0.72 U	0.77 UJNP	3.7 U
DU-NWC-07-20	2.9 UJNP	1.2 UJNP	0.54 UJ	1.5 UJ	0.72 U	0.77 UJ	3.8 IJNP
DU-SEA-07-02	1.4 U	0.61 UJNP	0.27 U	0.74 U	0.36 U	0.39 UJNP	1.9 UJN
DU-SEA-07-03	1.4 UJNP	0.61 UJNP	0.27 U	0.74 U	0.52 IJN	0.39 UJNP	1.9 UJNP
DU-SEA-07-04	1.8 UJNP	0.79 UJN	0.35 U	0.95 U	0.46 U	0.5 UJNP	2.4 UJNP
DU-SEC-07-05	1.4 UJNP	0.61 UJNP	0.27 U	0.74 UJNP	0.36 UJN	0.39 UJNP	1.9 UJNP

Field ID	Endrin Aldehyde (ug/kg)	Endrin Ketone (ug/kg)	gamma-BHC (Lindane) (ug/kg)	gamma-Chlordane (ug/kg)	Heptachlor (ug/kg)	Heptachlor Epoxide (ug/kg)	Methoxychlor (ug/kg)
DU-SWC-07-01	2.9 UJNP	1.2 UJNP	0.54 U	1.5 U	0.72 UJNP	0.77 U	3.7 UJNP
FWC13425H	8.2 UJNP	3.4 UJN	1.5 U	4.2 UJNP	2 U	2.2 UJNP	10.4 UJNP
FWC13564H	1.4 IJNP	0.6 UJNP	0.27 U	0.9 I	0.88 IJNP, Z2	0.38 U	1.8 UJNP
FWC13671H	8.5 JNP, Z2	0.6 UJNP	0.33 IJN, Z2	0.75 UJNP	0.36 U	0.38 UJNP	1.8 UJNP
FWC13810H	1.7 IJNP, Z2	0.64 IJNP	0.27 U	0.75 UJNP	0.36 U	1.5 JNP	1.8 UJNP
FWC13860H	3.3 IJNP, Z2	0.86 UJNP	0.54 IJN, Z2	1.1 UJNP	0.52 U	0.71 IJNP	2.7 UJNP
FWC14584H	2.4 IJN, Z2	0.97 UJNP	0.44 U	1.2 UJNP	0.58 U	1 IJNP	3 UJNP
FWC14616H	6.3 IJNP, Z2	1.6 UJNP	0.72 UJNP	2 U	0.96 U	1 UJNP	4.9 UJNP
FWC14752H	1.9 IJNP, Z2	0.6 UJNP	0.29 IJNPZ2	0.75 U	0.64 IJN, Z2	0.76 IJN	1.8 U

Field ID	Endrin Aldehyde (ug/kg)	Endrin Ketone (ug/kg)	gamma-BHC (Lindane) (ug/kg)	gamma-Chlordane (ug/kg)	Heptachlor (ug/kg)	Heptachlor Epoxide (ug/kg)	Methoxychlor (ug/kg)
FWC15173H	3.5 UJNP	1.4 UJNP	0.64 U	1.8 UJNP	0.86 U	1.8 IJNP	4.4 UJNP
FWC15212H	1.9 IJN, Z2	0.8 IJNP	1.1 IJN, Z2	0.75 UJNP	0.71 IJNP, Z2	1.4 JNP	1.8 UJNP
FWC15260H	7.2 UJNP	3 UJNP	1.4 UJN	3.8 U	2.3 IJNP, Z2	1.9 UJNP	9.2 UJNP
FWC15388H	3.4 JN, Z2	0.6 UJN	0.87 IJN, Z2	0.75 U	0.36 UJNP	0.38 UJNP	1.8 UJNP
FWC15475H	7.3 JN, Z2	1.1 IJNP	4.2 UJNP	1.2 U	0.63 IJNP, Z2	1.9 JN	2.9 UJNP
FWC15602H	2 IJN, Z2	0.6 UJNP	0.27 U	0.75 U	0.36 U	0.78 IJNP	1.8 UJNP
FWC15615H	6.3 JN, Z2	0.6 UJNP	0.27 U	0.8 IJNP	0.36 U	1.5 JN	1.8 UJNP
FWC15731H	5 JN, Z2	0.6 IJN	0.36 IJNPZ2	0.75 UJNP	0.36 U	0.44 IJNP	1.8 UJNP
FWC15736H	1.9 IJNP, Z2	0.8 UJNP	0.36 U	1.4 I	0.48 U	0.6 IJNP	2.5 UJN
FWC31201-WM-090408	3.3 UJNP	1.5 UJNP	0.92 U	1.3 U	1 UJNP	1.9 UJN	9.6 UJNP

Field ID	Endrin Aldehyde (ug/kg)	Endrin Ketone (ug/kg)	gamma-BHC (Lindane) (ug/kg)	gamma-Chlordane (ug/kg)	Heptachlor (ug/kg)	Heptachlor Epoxide (ug/kg)	Methoxychlor (ug/kg)
FWC31214-LK-090408	3 UJNP	1.4 UJN	0.85 U	1.2 UJNP	0.95 U	1.8 U	8.8 UJNP
FWC31215-WM-091708	3.4 UJNP	1.6 UJNP	0.95 U	1.4 UJN	1.1 IJN	2 UJN	9.9 UJNP
FWC31216-LK-090408	2.4 UJNP	1.2 IJNP	0.69 U	1.2 IJN	0.77 UJNP	1.4 U	7.2 UJNP
FWC31217-WM-090408	3.3 UJNP	1.5 UJNP	0.92 U	1.3 U	1.1 IJN	1.9 UJNP	9.6 UJNP
FWC31803B	2.9 U	1.2 U	0.53 U	1.5 U	0.71 U	0.76 U	3.6 UJN
FWC31803B	4 UJNP	1.6 UJNP	0.74 UJNP	2.1 U	0.98 U	1.1 U	5.1 UJNP
FWC31803B	4.8 UJNP	2 UJNP	0.9 UJNP	2.5 U	1.2 UJNP	1.3 UJNP	6.2 U
FWC31803B	5.2 U	2.2 UJNP	0.97 U	2.7 U	3 IJNP	1.4 UJNP	6.7 UJNP
FWC31803F	116 UJN	48.2 UJNP	21.7 UJNP	60.2 UJNP	28.9 U	38.8 IJNP	149 UJNP

Field ID	Endrin Aldehyde (ug/kg)	Endrin Ketone (ug/kg)	gamma-BHC (Lindane) (ug/kg)	gamma-Chlordane (ug/kg)	Heptachlor (ug/kg)	Heptachlor Epoxide (ug/kg)	Methoxychlor (ug/kg)
FWC31803L	17.3 UJNP	7.1 UJNP	3.2 U	8.9 UJNP	4.3 U	4.6 UJNP	22 U
FWC31809B	2.2 UJNP	0.91 UJNP	0.41 U	1.1 U	0.54 U	0.58 UJNP	2.8 UJNP
FWC31809B	2.7 UJNP	1.1 UJN	0.51 UJNP	1.4 U	0.67 UJNP	0.72 UJNP	3.5 UJNP
FWC31809B	2.8 UJNP	1.2 UJNP	0.52 U	1.4 UJNP	0.69 UJN	0.74 UJNP	3.6 UJNP
FWC31809B	3 UJNP	1.3 U	0.57 UJNP	1.6 U	0.76 U	0.81 UJNP	3.9 UJNP
FWC31809F	21.2 IJN	6.8 U	3.1 UJN	8.5 U	4.1 UJN	10.3 IJNP	21 UJN
FWC31809L	1.4 UJNP	0.6 UJNP	0.27 UJN	0.88 IJNP	0.36 UJNP	0.38 UJNP	1.8 UJNP
FWC31811B	2.6 UJNP	1.1 U	0.48 U	1.3 UJNP	0.64 U	0.68 UJNP	3.3 UJNP
FWC31811B	3.4 UJN	1.4 U	0.64 U	1.8 UJNP	0.85 U	0.91 U	4.4 UJN
FWC31811B	3.8 UJN	1.6 UJN	0.71 U	2 UJNP	0.95 U	1 UJNP	4.9 UJNP
FWC31811B	4.2 UJNP	1.7 U	0.78 U	2.2 UJNP	1 U	1.1 U	5.3 UJNP
FWC31811F	223 U	92.3 UJNP	41.5 UJNP	115 UJNP	55.4 U	75.4 IJNP	285 UJNP

Field ID	Endrin Aldehyde (ug/kg)	Endrin Ketone (ug/kg)	gamma-BHC (Lindane) (ug/kg)	gamma-Chlordane (ug/kg)	Heptachlor (ug/kg)	Heptachlor Epoxide (ug/kg)	Methoxychlor (ug/kg)
FWC31811L	14.5 UJN	6 U	6.2 I	7.5 UJNP	3.6 UJNP	3.8 UJNP	18.5 UJNP
FWC31813B	2.9 UJNP	1.2 UJNP	0.53 U	1.5 U	0.71 U	0.76 U	3.7 U
FWC31813B	3.9 UJNP	1.6 UJNP	0.72 U	2 U	0.96 U	1 UJNP	4.9 UJNP
FWC31813B	4 UJNP	1.6 UJNP	0.74 U	2.1 UJNP	0.99 U	1.1 U	5.1 U
FWC31813B	4 UJNP	1.7 UJN	0.75 U	2.1 UJNP	1 U	1.1 U	5.1 UJNP
FWC31813F	31.8 UJNP	13.2 UJNP	5.9 UJNP	38.2	7.9 U	16.8 IJNP	40.6 UJNP
FWC31813L	4.5 IJN	1.9 IJN	0.52 U	1.5 U	0.7 U	0.85 IJNP	3.6 U
FWC31822-U2W-040809	2.3 UJNP	1.2 IJN	0.66 U	0.96 UJNP	0.74 UJNP	1.4 UJNP	6.9 UJNP
FWC31828B	3.5 UJNP	1.1 UJNP	0.49 U	1.4 U	0.65 U	0.7 UJNP	3.4 UJNP
FWC31828B	3.6 IJNP	1.4 U	0.62 U	1.7 U	0.83 U	0.89 UJNP	4.3 UJNP
FWC31828B	3.6 IJNP	1.4 UJNP	0.65 UJNP	1.8 U	0.87 U	0.93 UJNP	4.5 U

Field ID	Endrin Aldehyde (ug/kg)	Endrin Ketone (ug/kg)	gamma-BHC (Lindane) (ug/kg)	gamma-Chlordane (ug/kg)	Heptachlor (ug/kg)	Heptachlor Epoxide (ug/kg)	Methoxychlor (ug/kg)
FWC31828B	4.6 IJNP	1.5 UJNP	0.67 U	1.9 U	0.9 U	0.96 UJNP	4.6 UJNP
FWC31828F	112 U	46.5 UJNP	20.9 U	58.1 UJNP	27.9 U	38.4 IJNP	143 UJNP
FWC31828L	11.5 JNP	4.5 IJN	2.2 IJN	3 UJNP	1.9 IJN	1.5 UJNP	7.4 U
FWC31831B	2.8 UJNP	1.1 UJN	0.48 UJNP	1.3 U	0.64 U	0.68 U	3.3 UJNP
FWC31831B	2.8 UJNP	1.2 UJN	0.52 U	1.5 U	0.7 U	0.75 U	3.6 UJNP
FWC31831B	2.8 UJNP	1.2 UJNP	0.53 U	1.5 U	0.7 U	0.75 U	3.6 U
FWC31831B	3 IJNP	1.2 UJNP	0.53 U	1.5 UJNP	0.71 UJNP	0.76 UJNP	3.6 UJNP
FWC31831F	90.9 UJNP	47.2 IJNP	16.9 UJNP	47 U	22.6 U	42.9 IJNP	116 UJN
FWC31831L	5.1 JNP	2.3 IJNP	0.54 U	1.5 U	0.72 U	1.8 IJ, JNP	3.7 U
FWC31832B	2.8 UJNP	1.1 UJNP	0.51 U	1.4 U	0.69 U	0.73 U	3.5 U
FWC31832B	2.9 UJNP	1.2 UJNP	0.54 U	1.5 U	0.72 U	0.77 U	3.7 UJNP
FWC31832B	2.9 UJNP	1.2 UJNP	0.55 U	1.5 U	0.73 U	0.78 U	3.8 UJNP

Field ID	Endrin Aldehyde (ug/kg)	Endrin Ketone (ug/kg)	gamma-BHC (Lindane) (ug/kg)	gamma-Chlordane (ug/kg)	Heptachlor (ug/kg)	Heptachlor Epoxide (ug/kg)	Methoxychlor (ug/kg)
FWC31832B	22.3 UJNP	9.2 UJNP	4.1 U	11.5 U	5.5 U	5.9 UJNP	28.4 U
FWC31832F	9.3 UJNP	3.8 UJNP	1.7 UJN	6.5 IJNP	2.3 U	9 JNP	11.9 UJNP
FWC31832L	14 J, JN	3.5 IJN	1.9 IJN	3 UJ, JNP	1.4 U	1.5 UJ, JNP	7.4 UJ
FWC31835B	6.2 UJNP	2.4 U	1.1 U	3 U	1.5 UJNP	1.5 UJNP	7.3 U
FWC31835B	6.9 UJNP	2.6 UJNP	1.2 UJNP	3.2 U	1.7 IJN	1.6 UJNP	7.9 U
FWC31835B	7.8 UJNP	2.9 U	1.3 U	3.6 U	1.9 U	1.8 U	8.8 U
FWC31835B	9.2 IJNP	3.2 U	1.5 UJNP	4 U	2 IJN	2.1 U	10 U
FWC31835F	27.5 UJNP	11.4 UJNP	5.1 UJN	14.2 U	6.8 U	40.5 JNP	35.1 UJNP
FWC31835L	5.8 UJNP	2.4 UJN	2.1 IJNP	3.5 IJNP	1.4 U	2.5 IJN	7.4 UJNP
FWC31838B	5.1 UJNP	2.1 U	1.2 IJNP	2.7 U	1.6 UJNP	1.6 UJNP	6.5 U
FWC31838B	5.9 UJNP	2.5 UJNP	1.2 IJNP	3.1 U	1.8 IJN	1.6 UJNP	7.6 U
FWC31838B	6.2 UJNP	2.6 U	1.2 U	3.2 U	1.9 IJNP	1.9 IJN	7.9 U

Field ID	Endrin Aldehyde (ug/kg)	Endrin Ketone (ug/kg)	gamma-BHC (Lindane) (ug/kg)	gamma-Chlordane (ug/kg)	Heptachlor (ug/kg)	Heptachlor Epoxide (ug/kg)	Methoxychlor (ug/kg)
FWC31838B	6.5 UJNP	2.7 U	2.3 IJN	3.4 U	2.2 IJN	2.3 IJN	8.4 U
FWC31838F	17.5 IJNP	6.4 UJNP	2.9 UJNP	10.9 IJNP	4.5 IJNP	28.4 JN	22.8 IJNP
FWC31838L	3.2 IJN	1.2 UJNP	1.1 IJN	1.5 UJNP	0.72 U	0.77 UJNP	3.7 UJNP
FWC31839B	5.7 UJNP	2.3 U	1.1 U	2.9 U	1.4 U	1.5 UJNP	7.2 U
FWC31839B	5.7 UJNP	2.4 U	1.1 U	3 U	1.4 U	1.5 U	7.3 U
FWC31839B	6.4 UJNP	2.6 U	1.2 UJNP	3.3 U	1.6 U	1.7 U	8.1 U
FWC31839B	7.1 U	2.9 U	2.2 IJNP	3.7 U	1.8 UJNP	1.9 UJNP	9 U
FWC31839F	18.2 UJNP	7.5 UJNP	3.4 UJNP	9.4 U	4.5 UJNP	35.3 JN	23.3 UJNP
FWC31839L	5.8 UJNP	2.4 UJNP	1.1 UJNP	3 U	1.4 UJNP	1.9 IJN	7.4 UJNP
FWC31842B	2.7 UJNP	1.1 UJNP	0.5 U	1.4 U	0.66 U	0.71 UJNP	3.4 UJNP
FWC31842B	2.9 UJNP	1.1 UJNP	0.52 U	1.4 U	0.68 IJNP, Z2	0.72 UJNP	3.5 UJNP
FWC31842B	3.5 IJNP,	1.1 UJNP	0.53 U	1.5 U	0.71 U	0.74 UJNP	3.5 U

Field ID	Endrin Aldehyde (ug/kg)	Endrin Ketone (ug/kg)	gamma-BHC (Lindane) (ug/kg)	gamma-Chlordane (ug/kg)	Heptachlor (ug/kg)	Heptachlor Epoxide (ug/kg)	Methoxychlor (ug/kg)
	Z2						
FWC31842B	12.9 JN, Z2	1.2 UJNP	0.89 IJNP	2.1 IJNP	1.2 IJNP, Z2	0.76 UJNP	3.7 UJNP
FWC31842F	80.6 UJN	33.3 UJNP	15 UJNP	41.7 U	20 UJNP	40.7 IJNP	103 UJN
FWC31842L	14.5 UJN	6 UJN	4.4 IJN	7.5 U	3.6 UJN	5 IJNP	18.5 UJNP
FWC31843B	2.8 UJNP	1.2 U	0.53 U	1.5 U	0.71 U	0.76 UJNP	3.6 UJNP
FWC31843B	4 UJNP	1.7 U	0.75 U	2.1 U	1.1 U	1.1 UJNP	5.1 U
FWC31843B	4.2 UJNP	1.7 U	0.81 U	2.2 U	1.2 IJN	1.1 U	5.4 U
FWC31843B	4.3 UJNP	1.8 U	2.4 IJN	2.2 U	2.2 IJN	1.1 U	5.5 UJNP
FWC31843F	94.5 UJNP	39.1 UJNP	17.6 U	48.9 UJNP	23.5 U	25.1 UJNP	121 U
FWC31843L	2.9 U	1.2 U	0.54 U	1.5 U	0.72 U	0.77 UJNP	3.7 UJNP
FWC31847B	2.7 UJNP	1.1 UJNP	0.51 U	1.4 UJNP	0.67 U	0.72 UJNP	3.5 U
FWC31847B	3 UJNP	1.3 U	0.57 U	1.6 UJNP	0.76 U	0.81 UJNP	3.9 U

Field ID	Endrin Aldehyde (ug/kg)	Endrin Ketone (ug/kg)	gamma-BHC (Lindane) (ug/kg)	gamma-Chlordane (ug/kg)	Heptachlor (ug/kg)	Heptachlor Epoxide (ug/kg)	Methoxychlor (ug/kg)
FWC31847B	3.2 UJNP	1.3 U	0.59 U	1.6 UJNP	0.78 UJNP	0.84 UJNP	4 U
FWC31847B	64.4 U	26.6 UJNP	12 UJN	33.3 U	16 U	43.6 IJNP	82.1 UJNP
FWC31847F	343 UJN	142 U	63.9 UJN	178 U	85.2 U	91.1 UJNP	438 U
FWC31847L	29 UJN	12 U	5.4 UJNP	15 U	7.2 UJNP	7.7 UJNP	37 U
FWC31851-LK-042209	2.9 UJNP	1.4 UJNP	0.82 U	1.2 U	0.92 UJN	1.7 U	8.5 U
FWC31863-LK-042209	2.2 UJNP	1 UJNP	0.63 U	0.91 UJNP	0.7 UJN	1.3 UJNP	6.5 UJNP
FWC31891B	3.9 IJN, Z2	1.2 UJNP	0.55 U	1.5 U	0.73 U	0.78 UJNP	3.8 UJNP
FWC31891B	4.1 IJNP, Z2	1.3 U	0.6 U	1.7 UJNP	0.8 U	0.85 UJNP	4.1 UJNP
FWC31891B	5.2 IJN, Z2	1.6 UJNP	0.7 U	1.9 U	0.95 U	1 UJNP	4.8 U
FWC31891B	6.8 JN, Z2	1.6 UJNP	0.72 UJNP	2 U	1.1 IJNP, Z2	1 UJNP	4.9 UJNP

Field ID	Endrin Aldehyde (ug/kg)	Endrin Ketone (ug/kg)	gamma-BHC (Lindane) (ug/kg)	gamma-Chlordane (ug/kg)	Heptachlor (ug/kg)	Heptachlor Epoxide (ug/kg)	Methoxychlor (ug/kg)
FWC31891F	69.7 UJNP	28.8 UJNP	13 UJNP	36.1 UJNP	17.3 U	18.5 UJNP	88.9 UJNP
FWC31891L	3.4 IJNP, Z2	1.2 UJNP	0.54 U	1.5 UJNP	0.84 IJNP, Z2	0.77 UJNP	3.7 UJNP
FWC31892-DU-092408	2.4 UJNP	1.1 UJNP	0.69 U	1 UJNP	0.77 UJNP	1.4 UJN	7.2 U
FWC31896B	3.1 IJNP	1.2 U	0.54 U	1.5 UJNP	0.72 UJN	0.77 UJNP	3.7 U
FWC31896B	3.6 UJNP	1.5 U	0.67 U	1.9 UJNP	0.9 U	0.96 U	4.6 U
FWC31896B	4.3 UJN	1.7 UJNP	0.75 U	2.1 UJNP	1.1 U	1.1 UJNP	5.1 U
FWC31896B	4.9 IJNP	1.8 UJNP	0.8 U	2.2 U	1.4 IJNP	1.1 UJNP	5.5 U
FWC31896F	68.2 UJNP	28.2 UJN	12.7 UJNP	39.1 IJNP	16.9 U	22.1 IJNP	87.1 UJNP
FWC31896L	1.4 UJNP	0.6 UJNP	0.27 U	0.84 IJNP	0.36 UJNP	0.38 UJNP	1.8 UJNP
FWC31898B	0.0039UJNP	0.0016 UJNP	0.00073 UJNP	0.002 U	0.00098 UJNP	0.001 U	0.005 U

Field ID	Endrin Aldehyde (ug/kg)	Endrin Ketone (ug/kg)	gamma-BHC (Lindane) (ug/kg)	gamma-Chlordane (ug/kg)	Heptachlor (ug/kg)	Heptachlor Epoxide (ug/kg)	Methoxychlor (ug/kg)
FWC31898B	2.8 UJNP	1.2 UJNP	0.52 U	1.5 UJNP	0.7 UJNP	0.75 UJNP	3.6 U
FWC31898B	3 IJNP	1.2 UJN	0.53 UJNP	1.5 UJNP	0.71 UJNP	0.76 UJNP	3.6 U
FWC31898B	6.6 JNP	1.3 U	0.6 U	1.7 UJNP	1.1 IJNP	0.85 U	4.1 U
FWC31898F	420 UJNP	174 UJNP	78.3 UJNP	217 UJNP	104 U	112 UJNP	536 U
FWC31898L	14.5 UJNP	6 UJN	3.5 IJN	7.5 UJNP	3.6 U	3.8 UJNP	18.5 UJNP
FWC31899B	3.6 IJNP	1.1 U	0.51 U	1.4 UJNP	0.8 IJNP	0.73 UJNP	3.5 U
FWC31899B	3.9 IJNP	1.6 U	0.71 U	2 U	0.95 UJNP	1 UJNP	4.9 UJN
FWC31899B	4.7 IJNP	1.8 UJN	0.82 U	2.3 U	1.1 UJNP	1.2 U	5.6 UJNP
FWC31899B	7.2 IJN	1.9 UJN	0.87 U	2.4 U	1.2 UJNP	1.2 UJN	5.9 UJNP
FWC31899F	42.8 UJNP	17.7 UJNP	8 UJN	22.1 UJNP	10.6 U	11.4 UJNP	54.6 UJNP
FWC31899L	2.9 UJNP	1.2 IJN	0.54 IJN	1.5 UJNP	0.88 IJNP	0.77 UJNP	3.7 UJNP
FWC32024-DU-	3.4 UJNP	1.6 IJNP	0.95 U	1.4 U	1.1 UJNP	2 U	9.9 U

Field ID	Endrin Aldehyde (ug/kg)	Endrin Ketone (ug/kg)	gamma-BHC (Lindane) (ug/kg)	gamma-Chlordane (ug/kg)	Heptachlor (ug/kg)	Heptachlor Epoxide (ug/kg)	Methoxychlor (ug/kg)
042209							
FWC32051-WM-091708	5.7 IJNP	1.7 UJNP	2.3 IJNP	1.4 UJNP	1.1 IJNP	2.1 U	10.3 UJNP
FWC32052-WM-091708	2.9 UJNP	1.4 UJNP	0.82 U	1.2 U	0.92 UJNP	1.7 UJNP	8.5 U
FWC32053-WM-091708	3.3 IJNP	1.5 UJNP	0.9 U	1.3 UJNP	1 UJNP	1.9 U	9.3 U
FWC32054-WM-091708	3.2 UJNP	1.5 UJNP	0.9 U	1.3 U	1 U	1.9 UJNP	9.3 U
FWC32055-WM-091708	3.1 UJNP	1.5 UJNP	0.87 U	1.3 UJNP	0.98 UJNP	1.8 UJNP	9.1 UJNP
FWC32056-WM-091708	3.1 UJNP	1.5 UJN	0.87 U	1.3 UJN	0.98 UJNP	1.8 UJNP	9.1 UJNP
FWC32057-WM-	3.2 UJNP	1.5 UJN	0.91 U	1.3 UJN	1 UJN	1.9 U	9.5 U

Field ID	Endrin Aldehyde (ug/kg)	Endrin Ketone (ug/kg)	gamma-BHC (Lindane) (ug/kg)	gamma-Chlordane (ug/kg)	Heptachlor (ug/kg)	Heptachlor Epoxide (ug/kg)	Methoxychlor (ug/kg)
091708							
FWC32058-WM-091708	3 UJNP	1.4 UJNP	0.85 U	1.2 UJN	0.95 UJNP	1.8 UJNP	8.8 U
FWC32059-WM-091708	3.3 U	1.5 UJN	0.92 UJNP	1.3 U	1 U	1.9 UJNP	9.6 U
FWC32060-WM-092408	3.2 UJNP	1.5 UJN	0.91 U	1.3 UJNP	1 UJNP	1.9 UJNP	9.5 U
FWC32061-WM-092408	3.3 UJNP	1.5 UJN	0.92 U	1.3 UJNP	1 IJN, Z2	1.9 UJNP	9.6 UJNP
FWC32062-WM-092408	3.2 UJNP	1.5 UJNP	0.91 U	1.3 UJNP	1 UJN	1.9 UJNP	9.5 U
FWC32063-WM-092408	2.6 UJNP	1.2 UJNP	0.74 U	2.1 IJN	0.83 UJN	1.6 UJNP	7.7 UJNP
FWC32064-WM-	3.1 UJNP	1.5 UJNP	0.88 U	1.3 UJNP	0.99 UJN	1.9 UJNP	9.2 U

Field ID	Endrin Aldehyde (ug/kg)	Endrin Ketone (ug/kg)	gamma-BHC (Lindane) (ug/kg)	gamma-Chlordane (ug/kg)	Heptachlor (ug/kg)	Heptachlor Epoxide (ug/kg)	Methoxychlor (ug/kg)
092408							
FWC32065-DU-092408	3.1 UJNP	1.4 UJNP	0.86 U	1.2 UJNP	0.97 U	1.8 UJNP	9 U
FWC32069-WM-040809	6.3 UJNP	2.9 UJN	1.8 U	2.6 UJN	2 U	3.7 UJN	18.4 UJNP
FWC32073-WM-040809	3.1 UJNP	1.5 UJNP	0.87 U	1.3 UJN	0.98 UJN	1.8 UJNP	9.1 U
FWC32110-LK-032509	3.1 UJNP	1.4 UJNP	0.86 U	1.2 UJNP	0.97 UJN	1.8 UJNP	9 U
FWC32119-LK-032509	3.1 IJNP, Z2	1.1 UJN	0.68 U	0.99 UJNP	0.76 U	1.4 UJN	7.1 U
FWC32125-DU-092408	2.8 UJNP	1.3 UJN	0.78 U	1.1 UJNP	0.87 U	1.6 UJNP	8.1 U
FWC32126-DU-	3.2 UJNP	1.5 UJNP	0.9 U	1.3 UJNP	1 UJNP	1.9 U	9.3 U

Field ID	Endrin Aldehyde (ug/kg)	Endrin Ketone (ug/kg)	gamma-BHC (Lindane) (ug/kg)	gamma-Chlordane (ug/kg)	Heptachlor (ug/kg)	Heptachlor Epoxide (ug/kg)	Methoxychlor (ug/kg)
092408							
FWC32129-U2W-040809	2.5 U	1.2 UJN	0.69 U	1 UJNP	0.78 U	1.5 UJNP	7.2 UJNP
FWC32136-LK-031609	2.4 UJNP	1.1 UJN	0.68 U	0.99 UJN	0.76 U	1.4 UJNP	7.1 U
FWC32142-DU-033109	2.5 UJNP	1.2 UJNP	0.92 IJN	1 UJNP	0.8 U	1.5 UJN	7.4 U
FWC32145-DU-033109	2.7 UJNP	1.2 UJN	0.75 U	1.1 UJN	0.84 U	1.6 UJNP	7.8 U
FWC32150-DU-033109	6.9 U	3.2 UJNP	1.9 U	2.8 U	2.2 UJNP, Z2	4.1 UJN	20.1 UJNP
FWC32151-DU-033109	2.4 UJNP	1.1 UJNP	0.67 U	0.98 U	0.76 U	1.4 U	7 U
FWC32152-LK-	2.2 UJNP	1 UJNP	0.61 U	0.89 UJN	0.69 UJNP	1.3 UJNP	6.4 UJNP

Field ID	Endrin Aldehyde (ug/kg)	Endrin Ketone (ug/kg)	gamma-BHC (Lindane) (ug/kg)	gamma-Chlordane (ug/kg)	Heptachlor (ug/kg)	Heptachlor Epoxide (ug/kg)	Methoxychlor (ug/kg)
032509							
FWC32153-U2W-040809	7.4 UJNP	3.5 UJNP	2.1 U	3 U	2.3 UJN	4.4 U	21.7 U
FWC32154-LK-031609	3.3 UJNP	1.5 U	0.92 U	1.3 UJNP	1 UJN	1.9 UJN	9.6 UJNP
FWC32157-LK-032509	2.1 UJNP	1 UJNP	0.6 U	0.87 UJN	0.68 U	1.3 UJN	6.3 UJNP
FWC32158-LK-031709	3.1 UJNP	1.4 UJN	0.86 U	1.2 U	0.97 U	1.8 UJNP	9 UJNP
FWC32160-LK-033109	3.3 UJNP	1.5 UJNP	0.92 UJN	1.3 U	1 U	1.9 UJNP	9.6 UJNP
FWC32161-U2W-040809	2.4 UJNP	1.1 UJNP	0.67 U	0.98 U	0.76 UJNP	1.4 UJN	7 U
FWC32168-LK-	4.3 UJNP	2 UJNP	1.2 U	1.7 U	1.3 UJNP	2.5 UJNP	12.5 U

Field ID	Endrin Aldehyde (ug/kg)	Endrin Ketone (ug/kg)	gamma-BHC (Lindane) (ug/kg)	gamma-Chlordane (ug/kg)	Heptachlor (ug/kg)	Heptachlor Epoxide (ug/kg)	Methoxychlor (ug/kg)
041509							
FWC32169-DU-033109	3.8 UJNP	1.8 UJNP	1.1 U	1.5 U	1.2 UJNP	2.2 UJNP	11 UJNP
FWC32173-LK-031709	4.9 UJNP	2.3 UJNP	1.6 IJN	2 UJNP	1.5 U	2.9 U	14.3 UJNP
FWC32176-U2W-090408	3.2 UJNP	1.5 UJN	0.91 U	1.3 UJNP	1 U	1.9 UJNP	9.5 UJNP
FWC32177-U2W-090408	3.2 UJNP	1.5 UJNP	1.6 IJN	1.3 UJNP	1 UJNP	1.9 UJNP	9.5 U
FWC32178-U2W-090408	3.5 UJNP	1.6 UJNP	0.98 U	1.4 U	1.1 U	2.1 UJN	10.2 UJNP
FWC32180-U2W-090408	2.4 U	1.1 UJNP	1 IJN	0.97 UJNP	0.75 U	1.4 UJN	6.9 UJNP
FWC32181-U2W-	2.7 UJNP	1.3 UJNP	0.76 U	1.1 UJNP	0.85 U	1.6 UJN	7.9 U

Field ID	Endrin Aldehyde (ug/kg)	Endrin Ketone (ug/kg)	gamma-BHC (Lindane) (ug/kg)	gamma-Chlordane (ug/kg)	Heptachlor (ug/kg)	Heptachlor Epoxide (ug/kg)	Methoxychlor (ug/kg)
090408							
FWC32182-U2W-090408	2.3 UJNP	1.1 UJNP	0.66 U	0.96 UJNP	0.74 U	1.4 UJNP	6.9 UJNP
FWC32183-U2W-090408	3.1 U	1.5 UJNP	0.88 UJNP	1.3 UJNP	0.99 U	1.9 UJN	9.2 UJN
FWC32184-U2W-090408	3.3 UJNP	1.6 U	0.94 U	1.4 UJNP	1.1 U	2 UJN	9.7 UJNP
FWC32185-U2W-090408	2.9 UJNP	1.4 UJNP	1.1 IJN	1.2 UJNP	0.93 U	1.7 UJN	8.6 U
FWC32186-U2W-090408	2.3 U	1.1 UJNP	0.77 IJN	0.96 UJNP	0.74 U	1.4 UJN	6.9 U
FWC32187-U2W-090408	3.4 UJNP	1.6 UJNP	0.95 U	1.4 UJNP	1.1 UJN	2 UJN	9.9 U
FWC32188-U2W-	3 U	1.4 UJNP	0.85 UJNP	1.2 UJNP	0.95 U	1.8 U	8.8 U

Field ID	Endrin Aldehyde (ug/kg)	Endrin Ketone (ug/kg)	gamma-BHC (Lindane) (ug/kg)	gamma-Chlordane (ug/kg)	Heptachlor (ug/kg)	Heptachlor Epoxide (ug/kg)	Methoxychlor (ug/kg)
090408							
FWC32189-U2W-090408	3 UJNP	1.4 UJN	0.85 U	1.2 UJNP	0.95 UJN	1.8 UJN	8.8 U
FWC32190-U2W-090408	2.2 UJNP	1 UJNP	0.62 U	0.9 UJNP	0.7 U	1.3 U	6.5 UJNP
FWC32191-U2W-090408	3.4 UJNP	1.6 U	0.96 UJNP	1.4 UJNP	1.1 U	2 UJNP	10 UJNP
FWC32192-U2W-090408	3.3 UJNP	1.6 UJNP	0.94 UJN	1.4 UJNP	1.1 U	2 UJNP	9.7 U
FWC32193-U2W-090408	3.4 UJN	1.6 UJNP	0.96 UJNP	1.4 UJNP	1.1 U	2 U	10 UJNP
FWC32194-LK-032509	2.8 IJNP	1 U	1.1 IJN	0.87 UJN	0.68 U	1.3 UJN	6.3 UJNP
FWC32195-LK-	2.8 UJNP	1.3 UJNP	1.4 IJNP	1.1 UJNP	0.87 U	1.6 UJN	8.1 UJNP

Field ID	Endrin Aldehyde (ug/kg)	Endrin Ketone (ug/kg)	gamma-BHC (Lindane) (ug/kg)	gamma-Chlordane (ug/kg)	Heptachlor (ug/kg)	Heptachlor Epoxide (ug/kg)	Methoxychlor (ug/kg)
031609							
FWC32198-LK-031609	2.8 IJNP	1.1 U	0.67 UJNP	0.97 UJNP	0.75 U	1.4 UJNP	6.9 U
FWC32199-LK-032509	3.3 UJNP	1.6 UJNP	0.94 U	1.4 UJNP	1.1 UJN	2 UJNP	9.7 UJNP
FWC32200-LK-031609	2.4 IJNP	1.1 UJNP	0.79 IJN	1 UJN	0.77 U	1.4 UJNP	7.2 UJNP
FWC32508-LK-101008	2.5 UJNP	1.2 UJNP	0.69 U	1 UJN	0.78 UJNP	1.5 UJN	7.2 UJNP
FWC32750-LK-041509	3.2 U	1.5 UJNP	0.91 UJNP	1.3 UJNP	1 U	1.9 UJN	9.5 UJNP
FWC32771-U2W-040809	4.2 UJNP	2 UJNP	1.2 U	1.7 UJNP	1.3 U	2.5 UJNP	12.2 UJNP
FWC32776-LK-	2.3 UJNP	1.1 U	0.88 IJNP	0.94 UJNP	0.72 U	1.4 U	6.7 U

Field ID	Endrin Aldehyde (ug/kg)	Endrin Ketone (ug/kg)	gamma-BHC (Lindane) (ug/kg)	gamma-Chlordane (ug/kg)	Heptachlor (ug/kg)	Heptachlor Epoxide (ug/kg)	Methoxychlor (ug/kg)
041509							
FWC32787-LK-041509	2.5 IJNP	1.1 UJNP	0.67 UJNP	0.97 UJN	0.75 U	1.4 UJNP	6.9 U
GFC 37192-FT	85 UJNP	36 U	16 UJNP	44 UJNP	21 U	42 IJNP	110 UJNP
GFC 37192-SC	19 UJNP	8.2 UJNP	3.6 U	9.9 U	4.8 U	5.2 U	25 UJNP
GFC 37193-FT	66 UJNP	28 UJNP	12 UJN	34 U	16 UJNP	32 IJNP	86 UJNP
GFC 37193-SC	12 U	5.1 UJNP	2.3 U	6.2 U	3 UJNP	3.3 U	16 UJNP
LA-CI-07-01	1.4 U	0.61 U	0.27 U	0.74 UJ	0.36 UJN	0.39 U	1.9 U
LA-CI-07-02	1.4 U	0.61 U	0.27 U	0.74 UJ	0.36 UJNP	0.39 U	1.9 U
LA-CI-07-03	1.4 U	0.61 U	0.27 U	0.74 UJ	0.36 UJN	0.39 UJNP	1.9 UJNP
LA-CI-07-04	1.4 U	0.61 U	0.27 U	0.74 UJNP	0.36 UJNP	0.39 U	1.9 UJNP
LA-CI-07-05	1.4 U	0.61 U	0.27 U	0.74 UJ	0.55 IJNP	0.39 U	1.9 UJNP

Field ID	Endrin Aldehyde (ug/kg)	Endrin Ketone (ug/kg)	gamma-BHC (Lindane) (ug/kg)	gamma-Chlordane (ug/kg)	Heptachlor (ug/kg)	Heptachlor Epoxide (ug/kg)	Methoxychlor (ug/kg)
LA-CI-07-06	1.4 U	0.61 U	0.27 U	0.74 UJ	0.36 UJNP	0.39 UJNP	1.9 UJNP
LA-CI-07-07	1.4 U	0.61 U	0.27 U	0.74 UJ	0.36 UJN	0.39 U	1.9 U
LA-NE-07-08	2.9 U	1.2 U	0.54 U	1.5 UJNP	1.6 IJNP	0.77 U	3.7 UJNP
LA-NE-07-09	2.9 U	1.2 UJNP	0.54 U	1.5 U	0.86 IJN	0.77 U	3.7 UJN
LA-NE-07-10	2.9 U	1.2 U	0.54 U	1.5 U	0.88 IJN	0.77 U	3.7 UJNP
LA-NE-07-11	2.9 U	1.2 UJNP	0.54 U	1.5 U	0.72 UJNP	0.77 U	3.7 UJNP
LA-NE-07-12	2.9 U	1.2 UJNP	0.54 U	1.5 U	0.72 UJNP	0.77 U	3.7 UJNP
LA-NE-07-13	2.9 U	1.2 UJNP	0.54 U	1.5 U	0.72 UJNP	0.77 U	3.7 UJNP
LA-NE-07-14	2.9 U	1.2 U	0.54 U	1.5 UJNP	0.72 UJN	0.77 UJNP	3.7 UJNP
LA-NE-07-16	2.9 U	1.2 UJN	0.54 U	1.5 U	0.72 UJN	0.77 U	3.7 UJNP
LA-NE-07-17	1.4 U	0.61 U	0.27 U	0.74 UJNP	0.36 UJNP	0.39 U	1.9 UJNP
LA-NE-07-18	1.4 UJNP	0.61 UJNP	0.27 U	0.74 U	0.36 U	0.39 U	2.5 IJNP

Field ID	Endrin Aldehyde (ug/kg)	Endrin Ketone (ug/kg)	gamma-BHC (Lindane) (ug/kg)	gamma-Chlordane (ug/kg)	Heptachlor (ug/kg)	Heptachlor Epoxide (ug/kg)	Methoxychlor (ug/kg)
LA-NE-07-19	1.4 U	0.61 UJNP	0.27 U	0.74 UJNP	0.36 U	0.39 UJNP	1.9 UJNP
LA-NE-07-20	1.4 UJNP	2.4 IJN	0.27 U	0.74 U	0.36 U	0.39 U	4.5 IJNP
U2W-MC-07-02	1.6 UJNP	1.2 IJN	0.29 U	0.8 U	1.3 IJN	0.42 U	2 UJNP
U2W-MC-07-03	1.4 U	0.61 UJNP	0.27 U	0.74 U	0.36 U	0.39 UJNP	1.9 UJN
U2W-MC-07-04	2.8 U	1.3 IJN	0.52 U	1.4 UJN	1.4 IJN	0.75 U	3.6 UJNP
U2W-MC-07-05	1.4 U	0.81 IJNP	0.27 U	0.74 U	0.36 UJNP	0.39 UJNP	1.9 UJNP
U2W-MC-07-06	1.4 U	1.3 IJN	0.27 U	0.74 UJNP	0.96 IJN	0.39 U	2 IJN
U2W-MC-07-07	1.4 UJNP	0.8 IJN	0.27 U	0.74 UJNP	1.2 IJN	0.39 UJNP	1.9 U
U2W-MC-07-08	1.4 U	0.61 UJN	0.27 U	0.74 UJNP	1.2 IJNP	0.39 UJNP	1.9 UJNP
U2W-MC-07-09	1.4 U	0.61 UJNP	0.27 UJNP	0.74 UJNP	0.36 UJNP	0.39 UJNP	1.9 UJNP
U2W-MC-07-10	1.4 U	0.8 IJNP	0.27 U	0.74 U	0.36 UJNP	0.39 U	1.9 UJNP
U2W-MC-07-11	1.4 U	1.1 IJN	0.27 U	0.74 U	0.46 IJNP	0.39 U	1.9 UJNP

Field ID	Endrin Aldehyde (ug/kg)	Endrin Ketone (ug/kg)	gamma-BHC (Lindane) (ug/kg)	gamma-Chlordane (ug/kg)	Heptachlor (ug/kg)	Heptachlor Epoxide (ug/kg)	Methoxychlor (ug/kg)
U2W-MC-07-12	1.4 U	0.61 UJNP	0.27 UJNP	0.74 UJNP	0.43 IJNP	0.39 U	1.9 UJN
U2W-MC-07-13	1.4 U	0.72 IJNP	0.27 UJNP	0.74 UJNP	1.2 IJNP	0.39 UJNP	2 IJN
U2W-MC-07-14	1.4 U	0.61 UJNP	0.27 U	0.74 UJNP	0.8 IJN	0.39 UJNP	2.6 IJNP
U2W-MC-07-15	1.4 U	0.61 UJNP	0.27 U	0.74 UJNP	0.47 IJNP	0.39 UJNP	1.9 UJNP
U2W-MC-07-16	1.4 U	0.61 UJNP	0.27 U	0.74 UJNP	0.38 IJNP	0.39 U	1.9 UJNP
U2W-MC-07-17	1.4 U	0.8 IJN	0.27 U	0.74 U	0.84 IJN	0.39 UJNP	1.9 UJN
U2W-MC-07-18	1.4 U	0.62 IJN	0.27 U	0.74 U	0.62 IJNP	0.39 UJNP	1.9 UJNP
U2W-MC-07-19	1.4 U	0.61 UJNP	0.27 U	1.1 IJNP	0.55 IJN	0.39 U	1.9 UJNP
U2W-MC-07-20	1.4 U	0.88 IJNP	0.27 U	0.74 U	0.44 IJNP	0.39 UJNP	1.9 UJN
U2W-RC-07-01	6.3 UJNP	2.7 UJN	1.2 U	3.3 UJNP	1.6 U	2.2 IJNP	8.2 UJNP
WM-G-07-01	1.4 U	0.61 U	0.27 UJ	0.74 UJNP	0.53 IJNP	0.39 UJ	3.9 IJN
WM-G-07-02	1.4 U	0.61 U	0.27 U	0.74 UJ	0.36 UJNP	0.39 U	1.9 UJNP

Field ID	Endrin Aldehyde (ug/kg)	Endrin Ketone (ug/kg)	gamma-BHC (Lindane) (ug/kg)	gamma-Chlordane (ug/kg)	Heptachlor (ug/kg)	Heptachlor Epoxide (ug/kg)	Methoxychlor (ug/kg)
WM-G-07-03	1.4 UJNP	0.61 U	0.27 U	0.74 UJNP	0.36 U	0.39 U	2.6 IJNP
WM-G-07-04	1.4 U	0.61 U	0.27 U	0.74 UJ	0.36 UJNP	0.39 U	1.9 U
WM-G-07-05	1.4 U	0.61 U	0.27 U	0.74 UJNP	0.36 U	0.39 UJNP	2.7 IJNP
WM-G-07-06	1.4 U	0.61 U	0.27 U	0.74 UJ	0.36 UJN	0.39 U	1.9 UJNP
WM-G-07-07	1.4 U	0.61 UJN	0.27 U	0.74 UJ	0.36 U	0.39 U	1.9 U
WM-G-07-08	1.4 U	0.61 U	0.27 U	0.74 UJ	0.42 IJNP	0.39 U	1.9 UJNP
WM-G-07-09	1.4 U	0.61 U	0.27 U	0.74 UJ	0.36 U	0.39 U	1.9 U
WM-G-07-10	1.4 U	0.61 U	0.27 U	0.74 UJ	0.36 UJNP	0.39 U	1.9 UJNP
WM-G-07-11	1.4 U	0.61 U	0.27 U	0.74 UJ	0.36 U	0.39 U	1.9 UJNP
WM-G-07-12	2.9 UJN	1.2 UJNP	0.54 U	1.5 UJNP	0.72 UJNP	0.77 U	3.7 UJN
WM-G-07-13	2.9 UJNP	1.2 UJNP	0.54 U	1.5 UJNP	1.7 IJN	0.77 U	3.7 UJNP
WM-G-07-14	2.9 UJNP	1.2 UJNP	0.54 U	1.5 U	0.72 UJNP	1.5 IJN	3.7 UJNP

Field ID	Endrin Aldehyde (ug/kg)	Endrin Ketone (ug/kg)	gamma-BHC (Lindane) (ug/kg)	gamma-Chlordane (ug/kg)	Heptachlor (ug/kg)	Heptachlor Epoxide (ug/kg)	Methoxychlor (ug/kg)
WM-G-07-15	2.9 UJN	1.2 UJN	0.54 U	1.5 U	0.72 U	0.77 U	3.7 UJN
WM-G-07-16	2.9 UJNP	1.2 UJN	0.54 U	1.5 U	0.72 UJNP	0.77 U	3.7 UJNP
WM-G-07-17	2.9 UJNP	1.2 UJNP	0.54 U	1.5 U	0.72 UJNP	0.77 U	3.7 UJN
WM-G-07-18	2.9 UJNP	1.2 UJNP	0.54 U	1.5 UJNP	1 IJNP	0.77 U	3.7 UJNP
WM-G-07-19	2.9 UJNP	1.2 U	0.54 U	1.5 U	0.72 UJNP	0.77 U	3.7 UJNP
WM-G-07-20	2.9 UJNP	1.2 U	0.54 U	1.5 U	1.1 IJNP	0.77 U	3.7 UJNP
ZNWA PIGFROG1	1.4 UJN	0.6 UJNP	0.27 UJNP	0.75 UJNP	0.36 U	0.38 U	1.8 UJNP
ZNWA PIGFROG2	1.4 UJNP	0.6 UJNP	0.27 U	0.75 UJNP	0.36 U	0.38 UJNP	1.8 U
ZNWB PIGFROG1	1.4 UJNP	0.6 UJNP	0.27 U	0.75 UJNP	0.36 U	0.38 U	1.8 U
ZNWB PIGFROG2	1.4 UJN	0.6 UJNP	0.27 U	0.75 U	0.36 U	0.38 U	1.8 UJNP
ZNWC PIGFROG1	1.4 UJN	0.6 UJN	0.27 U	0.75 U	0.36 UJNP	0.38 U	1.8 UJNP
ZNWC PIGFROG2	1.4 UJN	0.6 UJN	0.27 U	0.75 UJNP	0.36 UJNP	0.38 U	1.8 UJN

Field ID	Endrin Aldehyde (ug/kg)	Endrin Ketone (ug/kg)	gamma-BHC (Lindane) (ug/kg)	gamma-Chlordane (ug/kg)	Heptachlor (ug/kg)	Heptachlor Epoxide (ug/kg)	Methoxychlor (ug/kg)
ZSWA PIGFROG1	1.4 UJNP	0.6 UJNP	0.27 U	0.75 UJNP	0.36 U	0.38 U	1.8 UJNP
ZSWA PIGFROG2	1.4 UJNP	0.6 UJNP	0.27 U	0.75 U	0.36 U	0.38 U	1.8 U
ZSWA PIGFROG3	1.4 UJN	0.6 UJN	0.27 U	0.75 UJNP	0.36 U	0.38 UJ, JNP	1.8 U
ZSWC PIGFROG1	1.5 IJNP	0.6 U	0.27 U	0.88 I	0.9 IJNP	0.38 U	1.8 UJNP
ZSWC PIGFROG2	1.4 UJNP	0.6 UJNP	0.27 U	0.75 UJNP	0.36 U	0.38 U	1.8 UJNP
ZSWC PIGFROG3	1.4 UJN	0.6 UJN	0.29 IJNP	0.75 UJNP	0.36 U	0.38 U	2.6 IJN

Appendix G-4: Analysis data for OCP sample collections from Lake Apopka and the NSRA in 2007. Results from OCP analysis showing Oxychlordane, trans-nonachlor, Total Chlordane, and Toxaphene. Total chlordane (sum of cis-nonachlor, trans-nonachlor, oxychlordane, heptachlor epoxide, alpha-chlordane, gamma-chlordane and heptachlor). Comment codes are defined at the end of this appendix.

Field ID	Oxychlordane (ug/kg)	trans-Nonachlor (ug/kg)	Total Chlordane (ug/kg)	Toxaphene (ug/kg)
31203-FT	430	1200	2380 UJNP	2700
31203-SC	8.4 U	6.9 U	54.2 U	440 U
31206-FT	160 I	410	1115 UJNP	1900
31206-SC	8.9 U	7.5 I	56.7 U	470 U
31224-BL	0.86 UJNP	0.71 U	5.52 UJNP	61 U
31224-FT	200	630	1211 UJNP	3900
31224-LV	3.9	15	31.33 JNP	140 I
31224-MS	1.1 U	1.6 I	8.83 U	81 U
31224-SC	6 UJNP	10 I	49 UJNP	430 U
31225-BL	0.66 I	4	9.81 UJNP	42 I
31225-FT	200 I	2700	5444 UJNP	7700

Field ID	Oxychlordane (ug/kg)	trans-Nonachlor (ug/kg)	Total Chlordane (ug/kg)	Toxaphene (ug/kg)
31225-LV	8.4 I	97	205.7 UJNP	530
31225-MS	3 I	37	76.2 UJNP	220
31225-SC	10 IP	90	210.5 UJNP	1100 I
31225-ST	3.6 IJNP	21	45.9 U	370
31297-FT	45	79	159.6	520 I
31297-SC	22 U	18 U	141 U	1200 U
31298-FT	33	25	77.9 I	350
31298-SC	7 U	5.8 U	44.6 U	370 U
31299-BL	0.95 IJNP	0.78 I	4.22 UJNP	32 U
31299-FT	970 I	1300 I	3347 IJNP	6900
31299-LV	32	48	123.94	280
31299-MS	71	78	229 IJNP	520
31299-SC	7 UJNP	5.8 U	45 U	490 U

Field ID	Oxychlordane (ug/kg)	trans-Nonachlor (ug/kg)	Total Chlordane (ug/kg)	Toxaphene (ug/kg)
31300-BL	1.2 I	1.9	6.03 UJNP	38 U
31300-FT	840	1500	3191 IJNP	3500
31300-LV	8.5	16	33.89 IJNP	85 I
31300-MS	1.7 I	2.9	9.28 UJNP	62 U
31300-SC	18 U	15 U	116 U	1300 U
37177-BL	0.45 UJNP	0.37 U	2.91 UJNP	32 U
37177-FT	4.5 UJN	3.7 U	29.1 U	320 U
37177-LV	1 U	1.7 I	8.53 UJNP	71 U
37177-MS	1.2 U	1.3 I	8.9 UJNP	82 U
37177-SC	23 UJNP	19 U	145 U	1600 U
37194-BL	0.45 UJNP	0.37 U	2.91 UJNP	32 U
37194-FT	40 I	80	270 I	1300 I
37194-LV	0.99 U	1.2 I	7.15 IJNP	70 U

Field ID	Oxychlordane (ug/kg)	trans-Nonachlor (ug/kg)	Total Chlordane (ug/kg)	Toxaphene (ug/kg)
37194-MS	1.1 UJNP	0.94 U	7.19 UJNP	80 U
37194-SC	30 UJNP	25 U	194 U	2100 U
AP-07-108	2 I	9.3	30.8 IJNP	140 I
AP-07-109 A	9.6	46	107.3 IJNP	230
AP-07-109 B	3 I	16	44.67 IJNP	140 I
AP-07-110	3.2	14	43.99 IJNP	140 I
AP-07-111	40	150	311.7 IJNP	540
AP-07-112	3.2 I	18	54.24 IJNP	200
AP-07-113	87	560	1067 IJNP	1100
AP-07-114	16 I	110	273.3 IJNP	350
AP-07-201	14	64	163.2 IJNP	350 J
AP-07-202	39	200	494.9 IJNP	1000 J
AP-07-203	2.2 I	13	41.3 IJNP	250 IJ

Field ID	Oxychlordane (ug/kg)	trans-Nonachlor (ug/kg)	Total Chlordane (ug/kg)	Toxaphene (ug/kg)
AP-07-204	1.5 U	6.4	26.3 IJNP	140 IJ
AP-07-301	6	21	53.8 IJNP	150 IJ
AP-07-303	16	58	171 JNP	280 J
AP-07-304	65	210	432.4 U	820 J
AP-07-306	24	100	199.7 IJNP	330 J
AP-07-307	110	550	1286 IJNP	2700 J
AP-07-308	88	280	866 U	2100
AP-07-309	72	500	963 UJNP	1000
AP-07-310	33	75	226.2 I	450
AP-07-311	17	36	77.56 IJNP	140 I
AP-07-312	80	410	844 UJNP	990
AP-07-313	220	710	1694 IJNP	2400
AP-07-401	18 I	89	303.4 IJNP	730 J

Field ID	Oxychlordane (ug/kg)	trans-Nonachlor (ug/kg)	Total Chlordane (ug/kg)	Toxaphene (ug/kg)
AP-07-402	9	48	126.4 IJNP	420 &
AP-07-403	6.7 UP	57	168.7 IJNP	540 &
AP-07-404	1.4 IJNP	12	39.46 IJNP	170 I&
AP-07-405	140	640	1468 IJNP	3300 &
AP-07-406	3 I	11	38.4 IJNP	190 I&
AP-07-408	21	68	156.7 IJNP	400 &
ARA-07-10	86	680	1409.2 U	2900
ARA-07-101	110	770	1664 U	2300 J
ARA-07-102	130	880	1927 UJNP	4800 J
ARA-07-103	97	590	1336 UJNP	2200 J
ARA-07-104	86	500	1052.3 U	1400 J
ARA-07-105	220	1900	3222 UP	3800 J
ARA-07-106	210	980	2046 U	3300 J

Field ID	Oxychlordane (ug/kg)	trans-Nonachlor (ug/kg)	Total Chlordane (ug/kg)	Toxaphene (ug/kg)
ARA-07-107	72 I	500	1168 UJNP	2500 J
ARA-07-115	56	130	285.6 IJNP	330
ARA-07-116	26	85	179.2 IJNP	360
ARA-07-117	3.7	12	41.15 IJNP	170 I
ARA-07-118	300	810	2295 IJNP	5300
ARA-07-119	84	130	305.97 IJNP	630
ARA-07-120	200 I	1700	3443 I	5900 &
ARA-07-123	16 I	76	193.4 IJNP	550 &
ARA-07-124	47	62	161.5 IJNP	430 &
ARA-07-125	12	18	47.61 UJNP	75 I&
ARA-07-126	32 I	95	216 UJNP	440 &
ARA-07-127	56	78	225.7 UJNP	400 &
ARA-07-128	62	140	305.9 UJNP	720 &

Field ID	Oxychlordane (ug/kg)	trans-Nonachlor (ug/kg)	Total Chlordane (ug/kg)	Toxaphene (ug/kg)
ARA-07-302	77	370	688.8 IJNP	1400 J
ARA-07-407	31 I	220	517 UJNP	1400 &
ARA-07-409	34 I	210	495 UJNP	1600 &
ARA-07-410	16 I	120	263.2 UJNP	830 &
ARA-07-550	250	830	1379.5 I	940 &
ARA-07-601	1.7 I	3 I	12.25 U	84 U&
ARA-07-602	9.8	30	70.2 U	330 I&
ARA-07-603	13	13	40.3 U	130
ARA-07-8	16	63	151.6 I	540
ARA-07-9	48	400	780.8 UJNP	1700
DU-NWC-07-06	3.5	1.2 I	6.79 U	24 U
DU-NWC-07-07	4.9	0.37 UJNP	7.94 UJNP	24 U
DU-NWC-07-08	3	0.47 IP	5.56 UJNP	24 U

Field ID	Oxychlordane (ug/kg)	trans-Nonachlor (ug/kg)	Total Chlordane (ug/kg)	Toxaphene (ug/kg)
DU-NWC-07-09	1 IJNP	0.37 UP	4.53 UJNP	24 U
DU-NWC-07-10	1.9	0.37 UP	4.36 UJNP	24 U
DU-NWC-07-11	2	0.88 I	4.97 UJNP	24 U
DU-NWC-07-12	2.1	0.66 I	5.56 UJNP	24 U
DU-NWC-07-13	7.2	0.87 I	10.16 UJNP	24 U
DU-NWC-07-14	2.4	0.52 I	5.29 UJNP	24 U
DU-NWC-07-15	5.3	0.82 I	8.54 I	24 U
DU-NWC-07-16	6.8	0.52 I	9.77 UJNP	24 U
DU-NWC-07-17	0.7 IJNP	0.62 I	4.93 UJNP	24 U
DU-NWC-07-18	3.6	0.75 UP	8.75 U	48 U&
DU-NWC-07-19	2.9 P	2 I	10.44 U	48 U
DU-NWC-07-20	4.4	0.75 UJNP	9.33 U	48 UJ
DU-SEA-07-02	0.45 UJNP	0.37 UP	2.91 IJNP	24 U

Field ID	Oxychlordane (ug/kg)	trans-Nonachlor (ug/kg)	Total Chlordane (ug/kg)	Toxaphene (ug/kg)
DU-SEA-07-03	0.65 I	0.37 U	3.27 IJNP	24 U
DU-SEA-07-04	1.2 I	1.3 I	5.18 UJNP	31 U
DU-SEC-07-05	1.3	1.1 I	4.68 I	24 U
DU-SWC-07-01	3.2	0.75 U	8.22 UJN	48 U
FWC13425H	34.5	70.9	142.4 UJNP	98.7 J
FWC13564H	0.46 UJNP	1.7	5.48 IJNP	24 UJ
FWC13671H	1.8	5.5	11.13 I	24 UJ
FWC13810H	3	6.8	15.71 I	49.9 IJ
FWC13860H	1.4 IJNP	2.2	7.23 U	54.2 IJ
FWC14584H	8	15.4	29.61 IJNP	75.8 IJ
FWC14616H	1.2 UJNP	1 U	7.75 UJNP	64 UJ
FWC14752H	0.73 IJNP	1.1 I	4.85 U	24 UJ
FWC15173H	9.6	21.2	37.96 IJNP	57.1 UJ

Field ID	Oxychlordane (ug/kg)	trans-Nonachlor (ug/kg)	Total Chlordane (ug/kg)	Toxaphene (ug/kg)
FWC15212H	2.6	7.2	17.26	66.4 IJ
FWC15260H	27.3	49.2	103.7 UJNP	82.3 J
FWC15388H	1.1 I	2.4	6.11 UJNP	24 UJ
FWC15475H	2.1	5.7	18.04 I	54 IJ
FWC15602H	3.4 JNP	8.7	17.26 IJNP	48.9 IJ
FWC15615H	3.3	4.5	12.63 IJNP	47.6 IJ
FWC15731H	1.3	4.7	9.55 I	44.4 IJ
FWC15736H	2	4.8	10.97 UJNP	39.5 IJ
FWC31201-WM-090408	1.5 I	2 I	9.57 UUUUJNPUJNII	96.9 I
FWC31214-LK-090408	0.8 UJNP	1.1 U	7.57 UUUJNPUUUJNPU	81.9 I
FWC31215-WM-091708	1.1 IJNP	2 I	9.5 UUUJNIJNUJNIJNPI	116
FWC31216-LK-090408	1.2 I	1.4 I	7.47 UIJNIJNUJNPUII	56.3 I
FWC31217-WM-090408	0.87 UJNP	1.2 U	8.24 UUJNUIJNUJNPUJNPU	72.9 I

Field ID	Oxychlordane (ug/kg)	trans-Nonachlor (ug/kg)	Total Chlordane (ug/kg)	Toxaphene (ug/kg)
FWC31803B	0.89 UJNP	0.74 U	5.77 UJNP	65.7 UJ
FWC31803B	1.5 UJNP	1.2 I	8.51 U	66.5 IJ
FWC31803B	1.5 I	1.3 U	9.8 UJNP	80.3 UJ
FWC31803B	1.6 UJNP	1.3 UJNP	12.17 UJNP	121 IJ
FWC31803F	319	920	1650.6 UJNP	2110 J
FWC31803L	16.7	49.6	112.4 U	184 J
FWC31809B	0.69 U	0.57 U	4.38 U	36.2 UJ
FWC31809B	0.85 UJNP	0.7 U	5.46 UJNP	44.9 UJ
FWC31809B	0.88 UJNP	0.72 U	5.58 UJNP	46.2 UJ
FWC31809B	0.95 UJNP	0.79 U	6.16 UJNP	50.4 UJ
FWC31809F	57.9	53.9	185.2 IJNP	593 J
FWC31809L	1.2	2.4	6.1 I	24 UJ
FWC31811B	3 I	3.9	12.6 UJNP	42.5 UJ

Field ID	Oxychlordane (ug/kg)	trans-Nonachlor (ug/kg)	Total Chlordane (ug/kg)	Toxaphene (ug/kg)
FWC31811B	3.1	4.5	14.9 UJNP	58.6 IJ
FWC31811B	3.4	4.9	15.48 UJNP	63.2 UJ
FWC31811B	3.7	5.6	17.01 UJNP	69.4 UJ
FWC31811F	2700	6840	13427.8	5660 J
FWC31811L	67	142	316.4 I	278 IJ
FWC31813B	0.9 UJNP	0.74 U	5.78 UJNP	47.4 UJ
FWC31813B	1.2 UJN	1 U	7.75 U	64.2 UJ
FWC31813B	1.2 UJNP	1 UJNP	8.02 UJNP	65.8 UJ
FWC31813B	1.3 UJNP	1 U	8.15 UJNP	66.8 UJ
FWC31813F	77.3	111	336.3 U	876 J
FWC31813L	1.4 IJNP	3.6 P	22.25 U	46.5 UJ
FWC31822-U2W-040809	0.62 UJN	0.85 U	5.9 UUJNUJNPUJNPUJNPUJNU	52.8 I
FWC31828B	1.1 UJN	1.3 I	7.24 UJNP	43.5 UJ

Field ID	Oxychlordane (ug/kg)	trans-Nonachlor (ug/kg)	Total Chlordane (ug/kg)	Toxaphene (ug/kg)
FWC31828B	1.2 IJNP	1.4 I	7.33 UJNP	56 IJ
FWC31828B	1.5 I	1.4 I	7.54 UJNP	58 UJ
FWC31828B	1.6 I	1.8 I	8.24 UJNP	442 J
FWC31828F	641	1530	2892.3 I	2410 J
FWC31828L	25.3	76.9	131.9 IJNP	125 IJ
FWC31831B	0.8 U	0.66 U	5.13 UJNP	42.4 UJ
FWC31831B	0.88 U	0.73 U	5.71 U	46.6 UJ
FWC31831B	0.89 UJNP	0.73 U	5.74 U	46.9 UJ
FWC31831B	0.89 UJNP	0.74 U	5.77 U	47.2 UJ
FWC31831F	296	199	732.9 IJNP	1950 J
FWC31831L	5.5	4.5 P	19.92 UJ	96.6 IJ
FWC31832B	0.87 UJNP	0.71 U	5.53 UJNP	45.8 UJ
FWC31832B	0.91 U	0.75 U	5.84 UJNP	48 UJ

Field ID	Oxychlordane (ug/kg)	trans-Nonachlor (ug/kg)	Total Chlordane (ug/kg)	Toxaphene (ug/kg)
FWC31832B	0.92 UJNP	0.76 U	5.9 U	48.7 UJ
FWC31832B	7 U	5.8 UJNP	44.8 U	369 U
FWC31832F	37.6	66.4	155.8 I	352 I
FWC31832L	2.9 I	15.8 J	57.3	96 U
FWC31835B	1.8 U	1.5 U	11.9 UJNP	95 U
FWC31835B	1.9 UJNP	1.8 U	13 U	102 U
FWC31835B	2.2 UJNP	2 I	14.3 UJNP	115 U
FWC31835B	2.4 U	2 UJNP	15.6 U	129 U
FWC31835F	108	196	402.1 IJNP	1420
FWC31835L	8.3	21	46.2	226 I
FWC31838B	1.6 UJNP	1.3 U	11.35 U	84.8 U
FWC31838B	1.9 UJNP	1.5 UJNP	12.7 U	98.3 U
FWC31838B	1.9 UJNP	1.6 UJNP	12.8 UJNP	102 U

Field ID	Oxychlordane (ug/kg)	trans-Nonachlor (ug/kg)	Total Chlordane (ug/kg)	Toxaphene (ug/kg)
FWC31838B	2.1 UJNP	1.7 U	13.8 UJNP	108 U
FWC31838F	93.9	146	381 I	985
FWC31838L	1.4 I	13.9	34.39 IJNP	64.4 I
FWC31839B	1.8 UJNP	1.5 U	11.5 UJNP	93.8 U
FWC31839B	1.8 U	1.5 U	11.6 UJNP	94.5 U
FWC31839B	2 U	1.6 UJNP	12.8 U	105 U
FWC31839B	2.2 U	1.8 U	14.3 U	117 U
FWC31839F	152	314	756.4 IJNP	2840
FWC31839L	5	9.3	26.3 UJNP	138 I
FWC31842B	0.84 U	0.97 I	5.75 U	44.3 UJ
FWC31842B	0.86 U	1 IJNP	6.04 UJNP	55 I
FWC31842B	0.9 U	1.2 I	6.88 U	55.1 I
FWC31842B	1.2 I	2.3	8.71 UJNP	84 I

Field ID	Oxychlordane (ug/kg)	trans-Nonachlor (ug/kg)	Total Chlordane (ug/kg)	Toxaphene (ug/kg)
FWC31842F	430	1060	1926.7 I	3070
FWC31842L	27	84.4	157.1	274
FWC31843B	0.89 UJNP	0.74 U	5.77 UJNP	47.1 U
FWC31843B	1.3 UJNP	1 U	8.35 UJNP	66.6 U
FWC31843B	1.3 U	1.1 UJNP	8.68 U	70 U
FWC31843B	1.4 U	1.1 U	9.64 U	71.6 U
FWC31843F	107	211	550.9 UJNP	1140
FWC31843L	2.8	5.6	14.75 UJNP	60 I
FWC31847B	0.99 U	2.8	8.8 U	50.5 U
FWC31847B	0.99 I	3.1	9.13 U	52.3 U
FWC31847B	1 I	3.4	9.2 U	58 I
FWC31847B	197	344	839.5 UJNP	1500
FWC31847F	314	1100	2262.2 UJNP	2540

Field ID	Oxychlordane (ug/kg)	trans-Nonachlor (ug/kg)	Total Chlordane (ug/kg)	Toxaphene (ug/kg)
FWC31847L	29.6	82.2	181.6 U	281
FWC31851-LK-042209	0.77 U	1.1 U	7.35 UUJNUUJNUUU	90.4 I
FWC31863-LK-042209	0.59 U	0.81 U	5.58 UUJNUJNPUJNUJNPUU	57.4 I
FWC31891B	0.93 U	0.76 U	5.91 UJNP	48.9 U
FWC31891B	1 U	0.87 I	6.54 UJNP	53.3 U
FWC31891B	1.2 U	0.97 U	7.71 UJNP	62.3 U
FWC31891B	1.2 U	0.99 U	7.72 UJNP	63.7 U
FWC31891F	176	308	746.9 I	1100
FWC31891L	4.8	13.7 P	32.71 IJNP	104 I
FWC31892-DU-092408	0.65 U	0.89 U	6.11 UUJNPUJNPUJNPUJNUU	41.4 I
FWC31896B	0.91 UJNP	0.75 U	5.84 U	48 U
FWC31896B	1.1 UJNP	0.94 UP	7.28 U	59.9 U
FWC31896B	1.3 UJNP	1 U	8.55 U	70.6 I

Field ID	Oxychlordane (ug/kg)	trans-Nonachlor (ug/kg)	Total Chlordane (ug/kg)	Toxaphene (ug/kg)
FWC31896B	1.4 UJNP	1.3 I	8.87 UJNP	71.3 U
FWC31896F	47.3 I	123	342.2 UJNP	1030
FWC31896L	0.88 I	2.6	7.23 IJNP	34.6 I
FWC31898B	0.0012 U	0.001 U	0.00779 U	47.1 U
FWC31898B	0.89 U	0.74 U	5.77 U	59.5 I
FWC31898B	1 U	0.83 U	6.93 UJNP	61.2 U
FWC31898B	1 I	1.6 I	7.07 UJNP	75.7 I
FWC31898F	1010	2350	5510 I	7030
FWC31898L	36.6	88.9	206.1 I	368
FWC31899B	0.86 U	0.71 U	5.62 U	49.9 I
FWC31899B	1.2 U	0.99 U	7.71 U	63.2 U
FWC31899B	1.4 UJNP	1.1 U	8.91 U	73.3 U
FWC31899B	1.5 UJNP	1.2 U	9.37 UJNP	77.2 U

Field ID	Oxychlordane (ug/kg)	trans-Nonachlor (ug/kg)	Total Chlordane (ug/kg)	Toxaphene (ug/kg)
FWC31899F	41	105	287.8 IJNP	871
FWC31899L	0.91 U	3.2	10 IJNP	48 U
FWC32024-DU-042209	0.9 UP	1.2 U	8.5 UUJNPUUJNPUUPU	45.2 I
FWC32051-WM-091708	0.94 UJNP	1.3 U	8.88 UUJNUJNPIJNPUUJNPU	111 I
FWC32052-WM-091708	0.77 UJNP	1.1 U	7.35 UUJNUUJNPUJNPUJNPU	50.8 I
FWC32053-WM-091708	0.85 UJNP	1.2 U	8.07 UUJNUJNPUJNPUUJNPU	81.7 I
FWC32054-WM-091708	0.85 UJNP	1.3 I	8.17 UUJNUUUJNPUJNPI	69 I
FWC32055-WM-091708	0.82 UJNP	1.1 U	7.77 UUJNUJNPUJNPUJNPUJNPU	36.3 I
FWC32056-WM-091708	0.82 U	1.1 U	7.77 UUUJNUJNPUJNPUU	38.2 I
FWC32057-WM-091708	1.2 I	1.9 I	9.15 UUUJNUJNUII	53.2 I
FWC32058-WM-091708	1.3 I	2.2 I	9.17 UUPUJNUJNPUJNPII	84.5 I
FWC32059-WM-091708	0.87 U	1.2 I	8.14 UUUUUJNPUI	34.3 U
FWC32060-WM-092408	0.86 UP	1.2 U	8.11 UUPUJNPUJNPUJNPUPU	40.1 I

Field ID	Oxychlordane (ug/kg)	trans-Nonachlor (ug/kg)	Total Chlordane (ug/kg)	Toxaphene (ug/kg)
FWC32061-WM-092408	0.87 UJNP	2.1 I	9.27 IUUJNPIJN, Z2UJNPUJNPI	74.4 I
FWC32062-WM-092408	0.86 U	1.3 I	8.21 UUUJNPUJNUJNPUI	47.6 I
FWC32063-WM-092408	0.7 UJNP	2.4 I	9.94 IUIJNUJNUJNPUJNPI	55.8 I
FWC32064-WM-092408	0.84 U	2.8 I	11.13 IIUJNPUJNUJNPUI	62.1 I
FWC32065-DU-092408	0.81 U	1.1 U	7.62 UUJNUJNPUUJNPUU	32 U
FWC32069-WM-040809	1.7 UJNP	2.3 U	15.9 UUJNPUJNUUJNUJNPU	65.8 U
FWC32073-WM-040809	0.82 U	1.1 U	7.77 UUJNUJNUJNUJNPUU	36.7 I
FWC32110-LK-032509	0.81 U	1.1 U	7.62 UUJNUJNPUJNUJNPUU	55.2 I
FWC32119-LK-032509	0.64 U	0.88 U	6.05 UUJNPUJNPUUJNUU	25.3 U
FWC32125-DU-092408	0.73 U	1.2 I	7.34 IUPUJNPUUJNPUI	28.9 U
FWC32126-DU-092408	0.85 UJNP	1.2 U	8.07 UUJNPUJNPUJNPUUJNPU	33.3 U
FWC32129-U2W-040809	0.83 IJNP	1.2 I	6.71 UUJNUJNPUUJNPIJNPI	29.3 I
FWC32136-LK-031609	0.64 UJNP	0.88 U	6.05 UUUJNUUJNPUJNPU	32.6 I

Field ID	Oxychlordane (ug/kg)	trans-Nonachlor (ug/kg)	Total Chlordane (ug/kg)	Toxaphene (ug/kg)
FWC32142-DU-033109	0.67 U	0.92 U	6.33 UUJNPUJNPUUJNUU	26.4 U
FWC32145-DU-033109	1.6 I	1.6 I	8.26 UUJNPUJNUUJNPII	27.9 U
FWC32150-DU-033109	2.3 I	2.5 U	17.8 UUUUJNP, Z2UJNIU	71.6 U
FWC32151-DU-033109	1.6 I	1.5 I	7.6 UUJNPUUUII	25 U
FWC32152-LK-032509	0.58 U	0.85 I	5.56 UUJNPUJNUJNPUJNPUI	31.8 I
FWC32153-U2W-040809	2 UJNP	2.7 U	18.7 UUJNPUUJNUUJNPU	101 I
FWC32154-LK-031609	0.87 UJNP	1.4 I	8.34 UUJNUJNPUJNUJNUJNPI	50.4 I
FWC32157-LK-032509	1.2 I	2.1 I	7.75 IIUJNUUJNII	22.4 U
FWC32158-LK-031709	0.81 UJNP	1.1 U	7.62 UUJNPUUUJNPUJNPU	38.5 I
FWC32160-LK-033109	0.87 U	1.2 U	8.14 UUJNPUUUJNPUU	34.3 U
FWC32161-U2W-040809	0.65 I	0.87 U	6.02 UUUUJNPUJNIU	25.3 I
FWC32168-LK-041509	1.1 UJNP	1.5 U	10.5 UUUUJNPUJNPUJNPU	58.7 I
FWC32169-DU-033109	2.1 I	1.6 I	10.7 UUJNPUUJNPUJNPII	39.3 U

Field ID	Oxychlordane (ug/kg)	trans-Nonachlor (ug/kg)	Total Chlordane (ug/kg)	Toxaphene (ug/kg)
FWC32173-LK-031709	1.3 UJNP	1.8 U	12.3 UUJNPUJNPUUUJNPU	51.1 U
FWC32176-U2W-090408	0.86 UJNP	1.2 U	8.11 UUUJNPUUJNPUJNPU	33.8 U
FWC32177-U2W-090408	1.7 I	2.1 I	9.85 UUJNPUJNPUJNPUJNPII	35.4 I
FWC32178-U2W-090408	0.92 UJNP	1.3 U	8.84 UUUUUJNUJNPU	36.4 U
FWC32180-U2W-090408	0.63 UJNP	0.86 U	5.96 UUJNPUJNPUUJNUJNPU	24.7 U
FWC32181-U2W-090408	0.72 U	0.98 U	6.79 UUJNPUJNPUUJNUU	28.2 U
FWC32182-U2W-090408	0.62 UJNP	0.85 U	5.9 UUJNPUJNPUUJNPUJNPU	28.2 I
FWC32183-U2W-090408	0.84 UJNP	1.1 U	8.08 IUJNPUJNPUUJNUJNPU	32.9 U
FWC32184-U2W-090408	0.88 U	1.2 U	8.46 UUJNPUJNPUUJNUU	36 I
FWC32185-U2W-090408	0.78 U	1.1 I	7.39 UUUJNPUUJNUI	30.8 U
FWC32186-U2W-090408	0.62 UJNP	0.85 U	5.9 UUUJNPUUJNUJNPU	24.5 U
FWC32187-U2W-090408	1.7 I	1.2 U	9.3 UUUJNPUJNUJNIU	43.5 I
FWC32188-U2W-090408	0.8 UJNP	1.1 U	7.57 UUJNPUJNPUUUJNPU	31.6 U

Field ID	Oxychlordane (ug/kg)	trans-Nonachlor (ug/kg)	Total Chlordane (ug/kg)	Toxaphene (ug/kg)
FWC32189-U2W-090408	0.94 I	1.4 I	8.01 UUUJNPUJNUJNII	52.2 I
FWC32190-U2W-090408	0.59 U	0.8 U	5.55 UUJNPUJNPUUUU	23.4 I
FWC32191-U2W-090408	0.91 U	1.2 U	8.52 UUUJNPUUJNPUU	35.8 U
FWC32192-U2W-090408	0.88 UJNP	1.2 U	8.46 UUJNPUJNPUUJNPUJNPU	34.8 U
FWC32193-U2W-090408	0.91 U	1.2 UJNP	8.52 UUJNUJNPUUUUJNP	35.8 U
FWC32194-LK-032509	0.57 UJNP	0.78 U	5.42 UUJNUJNUUJNUJNPU	22.4 U
FWC32195-LK-031609	0.73 UJNP	1 U	6.87 UUUJNPUUJNUJNPU	42 I
FWC32198-LK-031609	0.63 U	0.86 U	5.96 UUUJNPUUJNPUU	24.7 U
FWC32199-LK-032509	0.88 UJNP	1.2 U	8.46 UUJNPUJNPUJNUJNPUJNPU	39.9 I
FWC32200-LK-031609	0.65 UJNP	1 I	6.22 UUJNUJNUUJNPUJNPI	25.5 U
FWC32508-LK-101008	0.66 UJNP	0.9 U	6.24 UUJNUJNUJNPUJNUJNPU	25.8 U
FWC32750-LK-041509	0.86 UJNP	1.2 U	8.11 UUJNPUJNPUUJNUJNPU	33.8 U
FWC32771-U2W-040809	1.1 U	1.5 U	10.5 UUJNPUJNPUUJNPUU	43.6 U

Field ID	Oxychlordane (ug/kg)	trans-Nonachlor (ug/kg)	Total Chlordane (ug/kg)	Toxaphene (ug/kg)
FWC32776-LK-041509	0.61 UJNP	0.84 U	5.82 UUJNPUJNPUUUJNPU	24 U
FWC32787-LK-041509	0.63 U	0.86 U	5.96 UUJNPUJNUUJNPUU	24.7 U
GFC 37192-FT	84	170	419 U	870 I
GFC 37192-SC	6.1 UP	5 U	39 U	320 U
GFC 37193-FT	330	1500	2352 UJNP	1900
GFC 37193-SC	3.8 UJNP	3.1 U	24.4 U	200 U
LA-CI-07-01	0.45 U	0.37 U	2.91 U	32 U
LA-CI-07-02	0.45 UJNP	0.37 U	2.91 UJNP	32 U
LA-CI-07-03	18	0.74 I	21.7 IJNP	32 U
LA-CI-07-04	0.45 UJNP	0.37 U	2.91 U	32 U
LA-CI-07-05	0.81 I	0.37 U	3.5 UJN	32 U
LA-CI-07-06	0.45 UJNP	0.37 U	2.91 UJNP	32 U
LA-CI-07-07	0.45 UJNP	0.37 U	2.91 U	32 U

Field ID	Oxychlordane (ug/kg)	trans-Nonachlor (ug/kg)	Total Chlordane (ug/kg)	Toxaphene (ug/kg)
LA-NE-07-08	1.4 I	0.75 U	7.33 UJNP	48 U
LA-NE-07-09	7.2	0.77 I	12.6 UJNP	48 U
LA-NE-07-10	1.2 I	0.75 U	6.34 U	48 U
LA-NE-07-11	7.4	0.75 U	12.53 U	48 U
LA-NE-07-12	1.2 I	0.75 U	6.32 UJNP	48 U
LA-NE-07-13	2.4 I	0.75 U	7.52 U	48 U
LA-NE-07-14	0.91 U	0.75 U	6 U	130 U
LA-NE-07-16	0.91 UJNP	0.75 U	6.3 UJNP	48 U
LA-NE-07-17	0.68 IJNP	0.37 U	3.63 UJNP	25 I
LA-NE-07-18	3	0.82 I	7 UJNP	24 U
LA-NE-07-19	0.5 IP	0.37 U	3.19 UJN	24 U
LA-NE-07-20	0.76 I	1.4	5.15 UJNP	24 U
U2W-MC-07-02	1.4	0.41 UP	5.13 UJNP	26 U

Field ID	Oxychlordane (ug/kg)	trans-Nonachlor (ug/kg)	Total Chlordane (ug/kg)	Toxaphene (ug/kg)
U2W-MC-07-03	9.4	2	15.12 UJNP	24 U
U2W-MC-07-04	1.1 IJNP	1.2 I	9.89 U	46 UJ
U2W-MC-07-05	5.2	0.66 I	8.55 IJNP	24 U
U2W-MC-07-06	2.2	0.37 U	5.65 U	24 U
U2W-MC-07-07	2	0.95 I	6.28 U	24 U
U2W-MC-07-08	1.7	0.44 I	6.4 UJNP	24 UJ
U2W-MC-07-09	2.6	0.89 I	6.09 UJN	32 U
U2W-MC-07-10	3.2	0.63 I	6.18 UJN	83 U
U2W-MC-07-11	2.3	0.37 U	4.93 UJN	24 U
U2W-MC-07-12	3	0.37 UP	5.75 UJNP	24 U
U2W-MC-07-13	3.8	0.37 UP	7.26 UJNP	24 U
U2W-MC-07-14	2.7	0.37 UP	5.9 U	25 U
U2W-MC-07-15	4.3	0.37 UP	6.91 I	24 U

Field ID	Oxychlordane (ug/kg)	trans-Nonachlor (ug/kg)	Total Chlordane (ug/kg)	Toxaphene (ug/kg)
U2W-MC-07-16	2.4	0.59 I	5.47 UJNP	24 U
U2W-MC-07-17	1.7	0.45 IP	5.36 UJNP	40 I
U2W-MC-07-18	1.7	0.78 I	5.04 UJNP	24 U
U2W-MC-07-19	2.4	1.1 I	9.24 UJNP	24 U
U2W-MC-07-20	2.3	0.37 UP	4.91 IJNP	24 U
U2W-RC-07-01	2 UP	5.5 I	17.2 UJNP	100 U
WM-G-07-01	0.54 IJNP	0.37 U	3.36 U	32 U
WM-G-07-02	1.9	0.37 U	4.44 U	32 U
WM-G-07-03	0.67 IJNP	0.37 U	3.38 U	32 U
WM-G-07-04	11	0.37 U	13.46 UJNP	32 U
WM-G-07-05	1.4 JNP	0.37 U	4.29 U	32 U
WM-G-07-06	0.45 UJNP	0.37 U	2.91 UJNP	32 U
WM-G-07-07	8.4	0.37 U	10.86 UJNP	32 U

Field ID	Oxychlordane (ug/kg)	trans-Nonachlor (ug/kg)	Total Chlordane (ug/kg)	Toxaphene (ug/kg)
WM-G-07-08	0.92 IJNP	0.37 U	3.82 UJNP	32 U
WM-G-07-09	1.4	0.37 U	3.86 U	32 U
WM-G-07-10	0.61 IJNP	0.37 U	3.07 UJNP	32 U
WM-G-07-11	0.89 I	0.37 U	3.35 UJNP	32 U
WM-G-07-12	1.1 I	0.75 U	6.49 UJN	48 U
WM-G-07-13	0.91 UJNP	0.75 U	7.21 UJNP	48 U
WM-G-07-14	1.7 I	0.75 U	7.62 IJN	48 U
WM-G-07-15	1.3 IJNP	0.75 U	8.79 UJNP	48 U
WM-G-07-16	1.6 I	0.75 U	6.53 UJNP	48 U
WM-G-07-17	1.6 I	0.75 U	7.19 UJNP	48 U
WM-G-07-18	0.91 UJNP	0.75 U	6.22 UJNP	48 U
WM-G-07-19	1 IJNP	0.75 U	5.93 UJN	48 U
WM-G-07-20	1.1 IJNP	0.75 U	6.41 UJN	48 U

Field ID	Oxychlordane (ug/kg)	trans-Nonachlor (ug/kg)	Total Chlordane (ug/kg)	Toxaphene (ug/kg)
ZNWA PIGFROG1	2.5	0.38 U	4.99 UJNP	24 UJ
ZNWA PIGFROG2	1.6	0.38 U	4.06 UJNP	24 U
ZNWB PIGFROG1	1.9	0.38 U	4.36 U	24 U
ZNWB PIGFROG2	2	0.38 U	4.46 U	24 U
ZNWC PIGFROG1	3.4	0.38 U	5.97 UJNP	24 U
ZNWC PIGFROG2	8.1	0.38 U	10.83 UJNP	24 U
ZSWA PIGFROG1	2.6	0.56 I	5.27 UJNP	24 U
ZSWA PIGFROG2	1.7	0.38 UJNP	4.16 UJNP	24 U
ZSWA PIGFROG3	0.46 U	0.38 U	2.93 U	24 U
ZSWC PIGFROG1	9.7	2.4	17.96 IJNP	31.4 I
ZSWC PIGFROG2	13.4	0.93 I	18.09 IJNP	29.6 I
ZSWC PIGFROG3	7.6	0.82 I	12.16 UJNP	24 U

Appendix G-5: Analysis data for OCP sample collections from Lake Apopka and the NSRA in 2007. Results from OCP analysis showing solid and moisture percentages. Comment codes are defined at the end of this appendix.

Field ID	Solids (%)	Moisture (%)
31203-FT	73	27
31203-SC	24.9	75.1
31206-FT	66.9	33.1
31206-SC	22.3	77.7
31224-BL	15.5	84.5
31224-FT	64.7	35.3
31224-MS	20.8	79.2
31224-SC	22	78
31225-BL	11.8	88.2
31225-FT	71.3	28.7
31225-LV	22.9	77.1
31225-MS	20.8	79.2
31225-SC	25	75
31225-ST	32.2	67.8
31297-FT	88.9	11.1
31297-SC	21.6	78.4

Field ID	Solids (%)	Moisture (%)
31298-FT	93.8	6.2
31298-SC	26.1	73.9
31299-BL	16.2	83.8
31299-FT	92.9	7.1
31299-LV	24.6	75.4
31299-MS	24	76
31299-SC	25.8	74.2
31300-BL	10.1	89.9
31300-FT	54.8	45.2
31300-LV	15.3	84.7
31300-MS	21.4	78.6
31300-SC	25	75
37177-BL	10.6	89.4
37177-FT	39.7	60.3
37177-LV	22.7	77.3
37177-MS	19.7	80.3
37177-SC	23.4	76.6

Field ID	Solids (%)	Moisture (%)
37194-BL	13.1	86.9
37194-FT	41	59
37194-LV	23.7	76.3
37194-MS	22	78
37194-SC	19.9	80.1
AP-07-108	33.2	66.8
AP-07-109 A	22.7	77.3
AP-07-109 B	14	86
AP-07-110	25.2	74.8
AP-07-111	40.9	59.1
AP-07-112	40.6	59.4
AP-07-113	40.2	59.8
AP-07-114	42.8	57.2
AP-07-201	27.1	72.9
AP-07-202	43.1	56.9
AP-07-203	36	64
AP-07-204	27.2	72.8

Field ID	Solids (%)	Moisture (%)
AP-07-301	32.3	67.7
AP-07-303	37.3	62.7
AP-07-304	39.8	60.2
AP-07-306	25	75
AP-07-307	23.6	76.4
AP-07-308	32.7	67.3
AP-07-309	40.4	59.6
AP-07-310	40.3	59.7
AP-07-311	11.8	88.2
AP-07-312	40.2	59.8
AP-07-313	39.1	60.9
AP-07-401	25.8	74.2
AP-07-402	42.5	57.5
AP-07-403	41.3	58.7
AP-07-404	39.4	60.6
AP-07-405	34.2	65.8
AP-07-406	36.8	63.2

Field ID	Solids (%)	Moisture (%)
AP-07-408	36.8	63.2
ARA-07-10	7.21	92.79
ARA-07-101	39.3	60.7
ARA-07-102	20.1	79.9
ARA-07-103	10.8	89.2
ARA-07-104	34	66
ARA-07-105	39.4	60.6
ARA-07-106	42.8	57.2
ARA-07-107	38	62
ARA-07-115	29.2	70.8
ARA-07-116	34.8	65.2
ARA-07-117	39.8	60.2
ARA-07-118	34.9	65.1
ARA-07-119	27	73
ARA-07-120	20.7	79.3
ARA-07-123	25.2	74.8
ARA-07-124	40.8	59.2

Field ID	Solids (%)	Moisture (%)
ARA-07-125	13.4	86.6
ARA-07-126	11.8	88.2
ARA-07-127	28.4	71.6
ARA-07-128	30.5	69.5
ARA-07-302	22.2	77.8
ARA-07-407	30.8	69.2
ARA-07-409	12.6	87.4
ARA-07-410	27	73
ARA-07-550	17.5	82.5
ARA-07-601	25.5	74.5
ARA-07-602	42.9	57.1
ARA-07-603	31.7	68.3
ARA-07-8	19.8	80.2
ARA-07-9	23.3	76.7
DU-NWC-07-06	23.9	76.1
DU-NWC-07-07	24.1	75.9
DU-NWC-07-08	27.3	72.7

Field ID	Solids (%)	Moisture (%)
DU-NWC-07-09	26.7	73.3
DU-NWC-07-10	24.9	75.1
DU-NWC-07-11	25	75
DU-NWC-07-12	29.9	70.1
DU-NWC-07-13	21.6	78.4
DU-NWC-07-14	21.6	78.4
DU-NWC-07-15	24.4	75.6
DU-NWC-07-16	24.6	75.4
DU-NWC-07-17	25.5	74.5
DU-NWC-07-18	27	73
DU-NWC-07-19	26.2	73.8
DU-NWC-07-20	27.5	72.5
DU-SEA-07-02	21.3	78.7
DU-SEA-07-03	22.1	77.9
DU-SEA-07-04	20.7	79.3
DU-SEC-07-05	21.4	78.6
DU-SWC-07-01	24.3	75.7

Field ID	Solids (%)	Moisture (%)
FWC13425H	20.1	79.9
FWC13564H	20	80
FWC13671H	21	79
FWC13810H	21.7	78.3
FWC13860H	22.3	77.7
FWC14584H	20.8	79.2
FWC14616H	18.9	81.1
FWC14752H	19.2	80.8
FWC15173H	21.4	78.6
FWC15212H	21.3	78.7
FWC15260H	21.6	78.4
FWC15388H	20.3	79.7
FWC15475H	20.7	79.3
FWC15602H	19.8	80.2
FWC15615H	22	78
FWC15731H	22.6	77.4
FWC15736H	21.8	78.2

Field ID	Solids (%)	Moisture (%)
FWC31201-WM-090408	13.1	86.9
FWC31214-LK-090408	14.1	85.9
FWC31215-WM-091708	14.2	85.8
FWC31216-LK-090408	15.1	84.9
FWC31217-WM-090408	14.3	85.7
FWC31803L	25.5	74.5
FWC31809L	25.4	74.6
FWC31811L	25	75
FWC31813L	25.2	74.8
FWC31822-U2W-040809	16.4	83.6
FWC31828L	24.4	75.6
FWC31831L	24	76
FWC31832L	25.9	74.1
FWC31835L	25.8	74.2
FWC31838L	25.5	74.5
FWC31839L	24.8	75.2
FWC31842L	24.7	75.3

Field ID	Solids (%)	Moisture (%)
FWC31843L	24.9	75.1
FWC31847L	24.6	75.4
FWC31851-LK-042209	14.4	85.6
FWC31863-LK-042209	16.3	83.7
FWC31891L	26.4	73.6
FWC31892-DU-092408	15.6	84.4
FWC31896L	25.8	74.2
FWC31898L	23.5	76.5
FWC31899L	24.3	75.7
FWC32024-DU-042209	13.4	86.6
FWC32051-WM-091708	14.9	85.1
FWC32052-WM-091708	15.8	84.2
FWC32053-WM-091708	18.5	81.5
FWC32054-WM-091708	14.7	85.3
FWC32055-WM-091708	16.8	83.2
FWC32056-WM-091708	14.6	85.4
FWC32057-WM-091708	15.5	84.5

Field ID	Solids (%)	Moisture (%)
FWC32058-WM-091708	16.4	83.6
FWC32059-WM-091708	14.7	85.3
FWC32060-WM-092408	14.3	85.7
FWC32061-WM-092408	15	85
FWC32062-WM-092408	17.3	82.7
FWC32063-WM-092408	14.2	85.8
FWC32064-WM-092408	12.3	87.7
FWC32065-DU-092408	13.5	86.5
FWC32069-WM-040809	12.9	87.1
FWC32073-WM-040809	14	86
FWC32110-LK-032509	15.4	84.6
FWC32119-LK-032509	18	82
FWC32125-DU-092408	14.5	85.5
FWC32126-DU-092408	14	86
FWC32129-U2W-040809	15.5	84.5
FWC32136-LK-031609	15.7	84.3
FWC32142-DU-033109	16.5	83.5

Field ID	Solids (%)	Moisture (%)
FWC32145-DU-033109	16.2	83.8
FWC32150-DU-033109	17.1	82.9
FWC32151-DU-033109	16.3	83.7
FWC32152-LK-032509	15.8	84.2
FWC32153-U2W-040809	17	83
FWC32154-LK-031609	14.9	85.1
FWC32157-LK-032509	15.8	84.2
FWC32158-LK-031709	14.4	85.6
FWC32160-LK-033109	13.7	86.3
FWC32161-U2W-040809	17.7	82.3
FWC32168-LK-041509	15.3	84.7
FWC32169-DU-033109	14.6	85.4
FWC32173-LK-031709	16.3	83.7
FWC32176-U2W-090408	16	84
FWC32177-U2W-090408	17	83
FWC32178-U2W-090408	20	80
FWC32180-U2W-090408	16.8	83.2

Field ID	Solids (%)	Moisture (%)
FWC32181-U2W-090408	16.9	83.1
FWC32182-U2W-090408	16.4	83.6
FWC32183-U2W-090408	19.9	80.1
FWC32184-U2W-090408	17.1	82.9
FWC32185-U2W-090408	17.7	82.3
FWC32186-U2W-090408	15.7	84.3
FWC32187-U2W-090408	16.6	83.4
FWC32188-U2W-090408	18.5	81.5
FWC32189-U2W-090408	18	82
FWC32190-U2W-090408	17.1	82.9
FWC32191-U2W-090408	16.8	83.2
FWC32192-U2W-090408	16.5	83.5
FWC32193-U2W-090408	16.1	83.9
FWC32194-LK-032509	15.3	84.7
FWC32195-LK-031609	15.5	84.5
FWC32198-LK-031609	14.4	85.6
FWC32199-LK-032509	16.2	83.8

Field ID	Solids (%)	Moisture (%)
FWC32200-LK-031609	15.3	84.7
FWC32508-LK-101008	14.1	85.9
FWC32750-LK-041509	16.8	83.2
FWC32771-U2W-040809	16	84
FWC32776-LK-041509	14.7	85.3
FWC32787-LK-041509	18.1	81.9
GFC 37192-FT	65.4	34.6
GFC 37192-SC	21	79
GFC 37193-FT	80.3	19.7
GFC 37193-SC	30	70
LA-CI-07-01	23.2	76.8
LA-CI-07-02	24.9	75.1
LA-CI-07-03	29.2	70.8
LA-CI-07-04	23.8	76.2
LA-CI-07-05	26.3	73.7
LA-CI-07-06	27	73
LA-CI-07-07	22.4	77.6

Field ID	Solids (%)	Moisture (%)
LA-NE-07-08	26.8	73.2
LA-NE-07-09	27.8	72.2
LA-NE-07-10	24.1	75.9
LA-NE-07-11	25.5	74.5
LA-NE-07-12	25.8	74.2
LA-NE-07-13	24.4	75.6
LA-NE-07-14	21	79
LA-NE-07-16	26.9	73.1
LA-NE-07-17	24.1	75.9
LA-NE-07-18	21.5	78.5
LA-NE-07-19	22.4	77.6
LA-NE-07-20	22.8	77.2
U2W-MC-07-02	22.1	77.9
U2W-MC-07-03	28.8	71.2
U2W-MC-07-04	25.7	74.3
U2W-MC-07-05	23.6	76.4
U2W-MC-07-06	24.2	75.8

Field ID	Solids (%)	Moisture (%)
U2W-MC-07-07	25.4	74.6
U2W-MC-07-08	23.4	76.6
U2W-MC-07-09	20.9	79.1
U2W-MC-07-10	19.1	80.9
U2W-MC-07-11	24.9	75.1
U2W-MC-07-12	26.2	73.8
U2W-MC-07-13	25.5	74.5
U2W-MC-07-14	25.1	74.9
U2W-MC-07-15	24.7	75.3
U2W-MC-07-16	28.6	71.4
U2W-MC-07-17	26.3	73.7
U2W-MC-07-18	23.4	76.6
U2W-MC-07-19	25	75
U2W-MC-07-20	25.1	74.9
U2W-RC-07-01	21	79
WM-G-07-01	26.2	73.8
WM-G-07-02	22.8	77.2

Field ID	Solids (%)	Moisture (%)
WM-G-07-03	25.6	74.4
WM-G-07-04	25.4	74.6
WM-G-07-05	25.4	74.6
WM-G-07-06	23.5	76.5
WM-G-07-07	19.6	80.4
WM-G-07-08	24.9	75.1
WM-G-07-09	24.2	75.8
WM-G-07-10	25.5	74.5
WM-G-07-11	21.4	78.6
WM-G-07-12	23.3	76.7
WM-G-07-13	20.2	79.8
WM-G-07-14	24.1	75.9
WM-G-07-15	25.2	74.8
WM-G-07-16	21.2	78.8
WM-G-07-17	25.4	74.6
WM-G-07-18	22.4	77.6
WM-G-07-19	23.8	76.2

Field ID	Solids (%)	Moisture (%)
WM-G-07-20	23.4	76.6
ZNWA PIGFROG1	24.8	75.2
ZNWA PIGFROG2	25	75
ZNWB PIGFROG1	22.3	77.7
ZNWB PIGFROG2	22	78
ZNWC PIGFROG1	23.4	76.6
ZNWC PIGFROG2	24.5	75.5
ZSWA PIGFROG1	21	79
ZSWA PIGFROG2	23.7	76.3
ZSWA PIGFROG3	23.1	76.9
ZSWC PIGFROG2	21.6	78.4
ZSWC PIGFROG3	24.4	75.6

Appendix G-6: Key to analysis tables throughout appendix G.

SYMBOL	MEANING
#	Project Manager determined that a problem exists with the data. Please refer to comment field for a more detailed explanation.
*	Not analyzed due to interference. Note: if reporting data to the U.S. Environmental Protection Agency Water Quality Storage and Retrieval (STORET) data base, a numerical value must be entered. Such values are not meaningful and shall not be used.
?	Data is rejected and should not be used.Some of all of the quality control data for the analyte were outside criteria, and the presence or absence of the analyte cannot be determined from the data.
A	Value reported is the mean (average) of two or more determinations. This code shall be used if the results of two or more discrete and separate samples are averaged. These samples shall have been processed and analyzed (e.g. laboratory replicate samples, field duplicates, etc.) independently. Do not use this code if the data are the result of replicate analysis on the same sample aliquot, extract or digestate. Under most conditions, replicate values shall be reported as individual analyses.
B	Results based upon colony counts outside the acceptable range. This code applies to microbiological tests and specifically to membrane filter colony counts. The code is to be used if the colony count is generated from a plate in which the total number of coliform colonies exceeds the method indicated ideal ranges, which are: Total Coliforms: 20-80 colonies Fecal Coliforms: 20-60 colonies
F	When reporting species, F indicates the female sex; or for FDEP data, the reported value failed to meet the established field quality control criteria for either precision or accuracy, or the sample matrix interfered with the ability to make an accurate field determination, or the value is questionable because of improper field sampling protocols
H	Value based on field kit determination; results may not be accurate. This code shall be used if a field screening test (i.e. field gas chromatograph data, immunoassay, vendor-supplied field kit, etc.) was used to generate the value and the field kit or method has not been recognized by the Department as equivalent to laboratory methods.
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

J	Estimated value; value not accurate. This code shall be used in the following instances: 1. surrogate recovery limits have been exceeded; 2. no known quality control criteria exists for the component; 3. the reported value failed to meet the established quality control criteria for either precision or accuracy; 4. the sample matrix interfered with the ability to make any accurate determination; or 5. if the data is questionable because of improper laboratory or field protocols (e.g. composite sample was collected instead of a grab sample). Note: a "J" value shall be accompanied by justification for its use. A "J" value shall not be used if another code applies (e.g., K, L, M, T, V, Y, PQL)
JN	This is a paired Data Qualifier Code. It was created for speciliazed work with En Chem when analyzing Toxaphene or other OCPs. If a satisfactory pattern match is not possible, Toxaphene quantitation results shall be reported with the "**JN**" qualifier code.
K	Off-scale low. Actual value is known to be less than the value given. This code shall be used if: 1. The value is less than the lowest calibration standard and the calibration curve is known to be non-linear; or 2. The value is known to be less than the reported value based on sample size, dilution or some other variable. This code shall not be used to report values that are less than the laboratory practical quantitation limit or laboratory method detection limit.
L	Off-scale high. Actual value is known to be greater than value given. To be used when the concentration of the analyte is above the acceptable level for quantitation (exceeds the linear range or highest calibration standard) and the calibration curve is known to exhibit a negative deflection.
M	When reporting chemical analyses: presence of material is verified but not quantified; the actual value is less than the value given. The reported value shall be the laboratory practical quantitation limit. This code shall be used if the level is too low to permit accurate quantification, but the estimated concentration is greater than the method detection limit. If the value is less than the method detection limit use "T" below. When reporting Oxygen Reduction Potential or Temperature: indicates a negative value. When reporting Species: indicates male sex.
N	Spiked sample recovery not within control limits.
O	Sampled, but analysis lost or not performed. Note: if reporting data to the U.S. Environmental Protection Agency Water Quality Storage and Retrieval (STORET) data base, a numerical value must be entered. Such values are not meaningful and shall not be used.

P	Presumptive evidence of presence of material. This qualifier shall be used if: The relative percent difference between the two columns for detected concentrations was greater than 40%. 1. the component has been tentatively identified based on mass spectral library search; 2. there is an indication that the analyte is present, but quality control requirements for confirmation were not met (i.e. presence of analyte was not confirmed by alternate procedures).
Q	Sample held beyond the accepted holding time. This code shall be used if the value is derived from a sample that was prepared or analyzed after the approved holding time restrictions for sample preparation or analysis.
T	Value reported is less than the laboratory method detection limit. The value is reported for informational purposes, only and shall not be used in statistical analysis.
U	Indicates that the compound was analyzed for but not detected. This shall be used to indicate that the specified component was not detected. The value associated with the qualifier shall be the laboratory method detection limit. Unless requested by the client, less than the method detection limit values shall not be reported (see "T" above).
V	Indicates that the analyte was detected in both the sample and the associated method blank. Note: the value in the blank shall not be subtracted from associated samples.
W	Value observed is less than lowest value reportable under T code. This code is used when a positive value is not observed or calculated for a result, i.e. the test instrument or calculation is not capable of producing negative values. In these cases, the lowest reportable value, which is the lowest positive value that is observable, is reported with the W.
Y	The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
Z	Too many colonies were present (TNTC), the numeric value represents the filtration volume.
Pace Code	
Z	This compound was separated in the check standard but it did not meet the resolution criteria as set forth in SW846.
&	Laboratory Control Spike recovery not within control limits.
2	Dissolved analyte or filtered analyte greater than total analyte; analyses failed QC based on precision criteria.

APPENDIX H
JUVENILE ALLIGATOR FASTING STUDY

INTRODUCTION

Crocodilian species have been known to accumulate contaminants in their environment and have been used in the past as bioindicators (Rauschenberger 2004). Campbell (2003) reviewed studies that involved ecotoxicology of crocodilians, and reported that eggs, and egg parts, were the most common tissue analyzed for contaminants. Liver, muscle, various fat bodies, and blood have been used to conduct OCP analysis on adult and juvenile alligators (Campbell 2003 and Rauschenberger 2004). In larger animals, biopsies of fat and muscle may be taken with minimal harm, but sampling liver tissue is lethal as is sampling fat and muscle in juveniles. Many crocodilian species are endangered, so noninvasive techniques of measuring OCP levels are needed. Rauschenberger (2004) suggested the use of eggs as a non invasive technique for sampling OCP levels in female crocodilians, but noted that samples from blood were not adequate due to the low lipid content.

Collection of a large number of specimens over time could significantly reduce the study population, so a nonlethal method, such as blood sampling, would be preferable if it provides a reasonable indication of OCP levels in body fat. We conducted an experiment on juvenile alligators to investigate the possibility of collecting OCP information from blood after fasting. During the active season, an alligator must be fasted for some time to allow body fat, and the associated OCPs stored therein, to be mobilized in response to the alligator's energy needs. Our hypotheses were: 1) Lipid and OCP concentrations in blood do not differ among time points, 2) Linear associations between blood and fat do not differ among the time points, and 3) Linear associations between blood and liver do not differ among the time points.

METHODS

Juvenile alligators (60-120 cm) were collected by hand at night from an airboat. Collections consisted of five from Lake Apopka, five from Phase I, five from the West Marsh, and two from Duda, for a total of 17. Upon capture, a blood sample was immediately taken from each alligator. Alligators were housed at the Florida Fish and Wildlife Conservation Commission Wildlife Research Laboratory in tanks specifically built to house alligators. Alligators were provided fresh water, closely monitored, and fasted for 19 days. Blood sampling was repeated on fasting day 7, 14, and 19. On day 19, alligators were euthanized (cervical dislocation with double pithing) and blood, liver and fat samples were collected for OCP analysis. OCPs were measured in the blood of each alligator for day 0 (initial collection), 7, 14, and 19, as well as liver and fat. Thus, each animal provided six samples (four blood, one fat, and one liver) to be sent to Pace Lab for analysis. To consider a plausible worst case, the minimum detection limit was substituted in cases where the OCP concentration was determined to be below the limit of detection.

Hypothesis 1 (lipid and OCP concentrations in blood do not differ among time points) was tested using PROC GLM (repeated ANOVA) and log transformed wet weight concentration to meet statistical assumption. Hypotheses 2 (linear associations between blood and fat do not differ among the time points) and 3 (linear associations between blood and liver do not differ among the time points) were evaluated by conducting linear regression analyses between OCP concentrations (log ng/g ww) of liver, fat, and the different blood sample time points.

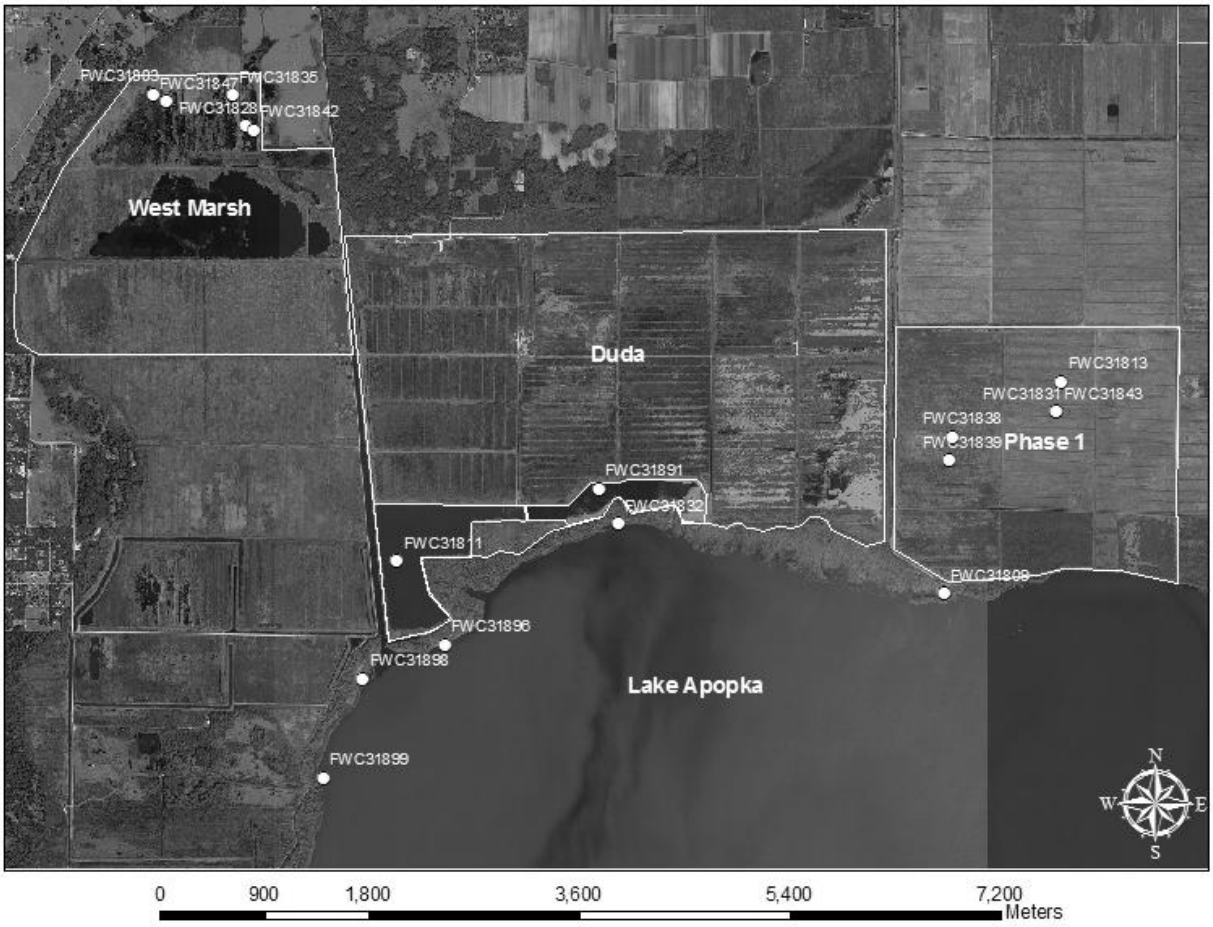


Figure 8. Locations where juvenile alligators were caught for OCP samples on NSRA of Lake Apopka in 2008.

RESULTS

Juvenile alligators (N = 17) were collected from Lake Apopka, Phase I, Duda, and the West Marsh properties within the NSRA in summer 2008. Lipid% for day 0 was significantly higher than the other time points. Because lipid% is a strong covariate with OCPs, OCP values were lipid-adjusted and log-transformed for comparison of the different time points. Comparisons of lipid-adjusted, log-transformed OCP concentrations among the time points indicated that day-0 OCP concentrations were significantly less than those of other time points for 4,4-DDT, aldrin, heptachlor epoxide, oxychlordane, trans-nonachlor, toxaphene, and sum OCPs (Table 4). Therefore, we concluded that fasting results in lowered blood lipid%, but increases OCP concentrations in the lipid fraction of blood. In regard to the liver samples, no significant linear associations ($P > 0.05$) were found between OCP concentrations in blood collected on day 0 (Figure 6). The day-7 blood concentrations had significant associations found for 4, 4'-DDE ($R^2 = 0.8014$, $P < 0.0001$). The day-14 blood concentrations had significant associations found for dieldrin ($R^2 = 0.4222$, $P = 0.00064$), 4, 4'-DDE ($R^2 = 0.8914$, $P = 0.0001$), and total OCPs ($R^2 = 0.3083$, $P = 0.0256$). In the day-19 blood concentrations, only 4, 4'-DDE ($R^2 = 0.8930$, $P \leq 0.001$) was determined to have a significant linear association with liver concentration.

In regard to the fat samples, no significant ($P > 0.05$) linear associations were found between OCP concentrations in blood collected on day 0 (Figure 7). The day-7 blood concentrations had significant associations found for 4, 4'-DDE ($R^2 = 0.8419$, $P < 0.0001$) and total OCPs ($R^2 = 0.5485$, $P = 0.0010$). The day-14 blood concentrations of OCPs were positively associated with those of dieldrin ($R^2 = 0.2885$, $P = 0.0319$), 4, 4'-DDE ($R^2 = 0.7263$, $P < 0.001$), and total OCPs ($R^2 = 0.4314$, $P = 0.0057$). In the day-19 blood concentrations, only 4, 4'-DDE ($R^2 = 0.7874$, $P < 0.0001$) had a significant linear association with fat concentration.

Table 4. Comparisons of OCP concentrations (lipid-adjusted) among time points. Different letters indicate significant differences ($P < 0.05$) for lipid-adjusted, log-transformed values (PROC GLM for repeated measures).

Constituent	Statistic	Day-0	Day-7	Day-14	Day-19
4,4'-DDD	MEAN	1,452.31	1,143.74	1,226.18	1,442.38
	STD	2,381.79	489.57	469.06	1,676.75
	MIN	1.30	500.00	625.00	461.90
	MAX	10,153.85	2,250.00	2,400.00	7,600.00
	N	16.00	16.00	16.00	16.00
4,4'-DDE	MEAN	25,910.79	28,368.45	27,662.93	33,449.68
	STD	26,754.77	42,283.96	29,185.42	37,982.73
	MIN	6.90	2,900.00	2,300.00	2,466.67
	MAX	74,000.00	165,384.62	103,529.41	138,333.33
	N	16.00	16.00	16.00	16.00
4,4'-DDT	MEAN	636.72 A	889.53 B	957.53 B	1118.9 B
	STD	421.47	376.16	361.87	1,299.98
	MIN	1.00	392.86	458.33	361.90
	MAX	1,600.00	1,750.00	1,800.00	5,900.00
	N	16.00	16.00	16.00	16.00
4,4'-DDTr	MEAN	2,654.57	3,009.50	3,046.96	3,637.36
	STD	2,181.24	2,813.38	1,993.45	2,736.82
	MIN	1.72	780.95	1,080.56	940.00
	MAX	7,315.38	12,087.18	7,578.43	9,935.56
	N	16.00	16.00	16.00	16.00
4,4'-DDTx	MEAN	27,999.82	30,401.71	29,846.64	36,010.96
	STD	28,128.02	42,207.91	29,198.23	37,523.59
	MIN	9.20	4,223.08	5,091.67	5,066.67
	MAX	81,776.92	167,307.69	104,770.59	139,633.33
	N	16.00	16.00	16.00	16.00
Aldrin	MEAN	623.74 A	845.82 B	901.24 B	1058.37 B
	STD	398.89	370.65	333.12	1,233.61
	MIN	0.99	357.14	458.33	342.86
	MAX	1,500.00	1,666.67	1,700.00	5,600.00
	N	16.00	16.00	16.00	16.00

Constituent	Statistic	Day-0	Day-7	Day-14	Day-19
alpha-BHC	MEAN	769.91	989.23	1,001.65	1,185.85
	STD	583.13	389.38	374.07	1,390.85
	MIN	1.10	513.33	500.00	376.19
	MAX	2,300.00	1,833.33	1,900.00	6,300.00
	N	16.00	16.00	16.00	16.00
alpha-Chlordane	MEAN	508.04	625.99	670.41	787.38
	STD	346.30	278.11	253.60	903.55
	MIN	0.73	267.86	337.50	252.38
	N	16.00	16.00	16.00	16.00
beta-BHC	MEAN	765.77	1,062.42	1,137.36	1,342.11
	STD	502.59	458.84	433.64	1,566.44
	MIN	1.20	464.29	583.33	428.57
	MAX	1,900.00	2,083.33	2,200.00	7,100.00
	N	16.00	16.00	16.00	16.00
cis-Nonachlor	MEAN	591.61	822.24	888.51	1,081.67
	STD	374.16	431.64	357.35	1,121.61
	MIN	0.88	321.43	404.17	304.76
	MAX	1,300.00	1,923.08	1,647.06	5,000.00
	N	16.00	16.00	16.00	16.00
Decachlorobiphenyl (S)	MEAN	94,137.97	125,733.96	138,795.17	168,318.18
	STD	46,920.56	48,848.38	33,031.10	75,751.42
	MIN	18,000.00	26,666.67	89,000.00	78,000.00
	MAX	180,909.09	227,000.00	205,454.55	357,000.00
	N	16.00	16.00	16.00	16.00
delta-BHC	MEAN	843.37	1,154.41	1,234.31	1,467.46
	STD	537.15	484.13	475.22	1,697.82
	MIN	1.40	500.00	625.00	466.67
	MAX	2,000.00	2,250.00	2,400.00	7,700.00
	N	16.00	16.00	16.00	16.00
Dieldrin	MEAN	833.95	867.11	954.55	1,100.49
	STD	894.16	411.28	432.22	1,083.79
	MIN	0.87	317.86	400.00	300.00
	MAX	3,400.00	1,636.36	2,000.00	4,900.00
	N	16.00	16.00	16.00	16.00
Endosulfan I	MEAN	481.63	665.76	716.02	843.45
	STD	316.29	285.37	269.69	992.60
	MIN	0.79	289.29	362.50	271.43
	MAX	1,200.00	1,333.33	1,400.00	4,500.00

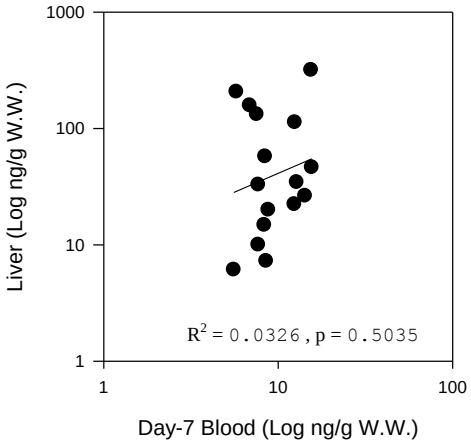
Constituent	Statistic	Day-0	Day-7	Day-14	Day-19
	N	16.00	16.00	16.00	16.00
Endosulfan II	MEAN	812.29	1,131.64	1,208.27	1,424.07
	STD	529.68	481.22	449.28	1,652.16
	MIN	1.30	500.00	625.00	457.14
	MAX	2,000.00	2,166.67	2,300.00	7,500.00
	N	16.00	16.00	16.00	16.00
Endosulfan sulfate	MEAN	1,332.95	1,835.26	1,982.15	2,343.59
	STD	878.35	789.49	739.57	2,710.13
	MIN	2.20	785.71	1,000.00	761.90
	MAX	3,300.00	3,583.33	3,800.00	12,300.00
	N	16.00	16.00	16.00	16.00
Endrin	MEAN	609.80	845.82	901.24	1,058.37
	STD	398.51	370.65	333.12	1,233.61
	MIN	0.99	357.14	458.33	342.86
	MAX	1,500.00	1,666.67	1,700.00	5,600.00
	N	16.00	16.00	16.00	16.00
Endrin aldehyde	MEAN	2,577.40	3,420.69	3,988.22	5,442.91
	STD	1,817.27	1,398.86	1,558.62	5,359.46
	MIN	3.90	1,750.00	1,791.67	1,333.33
	MAX	6,545.45	6,500.00	6,900.00	22,300.00
	N	16.00	16.00	16.00	16.00
Endrin ketone	MEAN	1,000.77	1,382.50	1,489.08	1,751.37
	STD	657.84	595.09	562.64	2,027.47
	MIN	1.60	607.14	750.00	571.43
	MAX	2,500.00	2,666.67	2,900.00	9,200.00
	N	16.00	16.00	16.00	16.00
gamma-BHC (Lindane)	MEAN	558.87	659.07	686.04	811.13
	STD	527.35	323.51	278.46	900.77
	MIN	0.73	267.86	337.50	252.38
	MAX	2,300.00	1,294.12	1,300.00	4,100.00
	N	16.00	16.00	16.00	16.00
gamma-Chlordane	MEAN	1,283.18	1,727.19	1,874.58	2,193.71
	STD	821.21	737.30	707.10	2,533.96
	MIN	2.00	750.00	916.67	714.29
	MAX	3,100.00	3,333.33	3,600.00	11,500.00
	N	16.00	16.00	16.00	16.00
Heptachlor	MEAN	668.50	909.54	1,070.59	1,071.36
	STD	515.14	406.95	669.22	1,217.44
	MIN	0.98	460.00	458.33	338.10

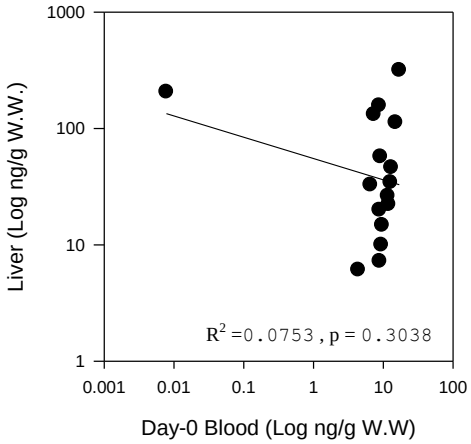
Constituent	Statistic	Day-0	Day-7	Day-14	Day-19
	MAX	2,200.00	1,900.00	3,000.00	5,500.00
	N	16.00	16.00	16.00	16.00
Heptachlor epoxide	MEAN	636.72 A	889.53 B	988.78 B	1143.9 B
	STD	421.47	376.16	419.61	1,304.11
	MIN	1.00	392.86	458.33	361.90
	MAX	1,600.00	1,750.00	1,900.00	5,900.00
	N	16.00	16.00	16.00	16.00
Methoxychlor	MEAN	3,080.01	4,252.42	4,587.34	5,403.86
	STD	2,013.58	1,833.33	1,718.48	6,258.00
	MIN	5.00	1,821.43	2,291.67	1,714.29
	MAX	7,600.00	8,333.33	8,800.00	28,400.00
	N	16.00	16.00	16.00	16.00
Oxychlordane	MEAN	820.45 A	1163.31 B	1234.91 B	1499.27 B
	STD	518.45	525.05	458.68	1,551.61
	MIN	1.20	464.29	583.33	423.81
	MAX	1,900.00	2,307.69	2,200.00	7,000.00
	N	16.00	16.00	16.00	16.00
Tetrachloro-m-xylene (S)	MEAN	72,376.93	92,571.89	101,494.37	132,158.55
	STD	44,923.57	49,619.54	35,988.24	84,847.70
	MIN	7,000.00	13,000.00	47,000.00	27,000.00
	MAX	162,727.27	154,000.00	155,000.00	352,000.00
	N	16.00	16.00	16.00	16.00
Total Chlordane	MEAN	6,193.34	7,840.29	8,274.93	11,258.41
	STD	4,035.52	2,835.54	4,002.93	15,486.47
	MIN	7.79	3,053.57	0.00	2,747.62
	MAX	15,000.00	13,000.00	16,140.00	68,700.00
	N	16.00	16.00	16.00	16.00
Toxaphene	MEAN	43785.38 A	55799.67 AB	87162.99 B	72912.49 B
	STD	24,270.62	23,227.46	88,006.83	80,680.85
	MIN	18,100.00	25,214.29	29,833.33	22,428.57
	MAX	98,300.00	107,500.00	401,818.18	369,000.00
	N	16.00	16.00	16.00	16.00
trans-Nonachlor	MEAN	855.9 A	1098.51 AB	1094.03 B	1408.63 B
	STD	606.17	806.85	529.49	1,358.05
	MIN	1.00	357.14	458.33	352.38
	MAX	2,153.85	3,769.23	2,647.06	5,800.00
	N	16.00	16.00	16.00	16.00
totalOCP	MEAN	294902.65 A	372207.18 B	427176.98 B	494825.84 B
	STD	139,197.78	141,051.45	136,477.43	246,286.36

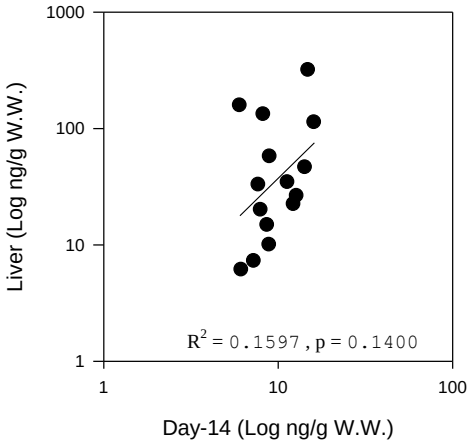
Constituent	Statistic	Day-0	Day-7	Day-14	Day-19
	MIN	95,357.77	176,255.95	239,522.22	208,992.38
	MAX	585,243.33	705,187.18	807,854.55	1,245,080.00
	N	16.00	16.00	16.00	16.00

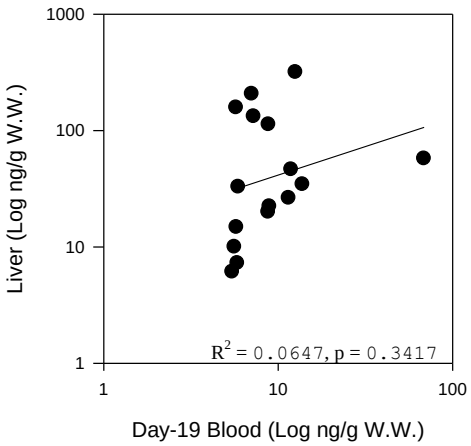
Figure 6. Linear regression of OCP blood concentrations (log ng/g ww) and liver OCP concentrations (log ng/g ww).

Total Chlordane

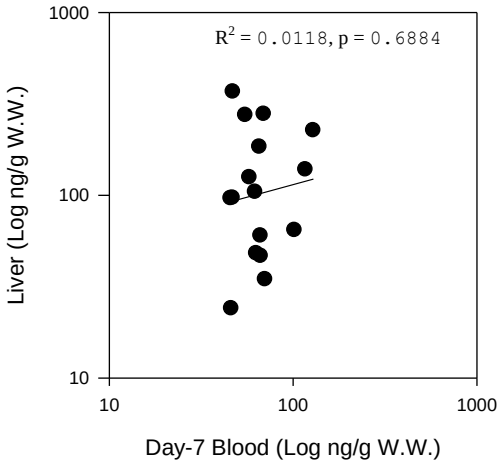








Toxaphene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10
10
100
1000
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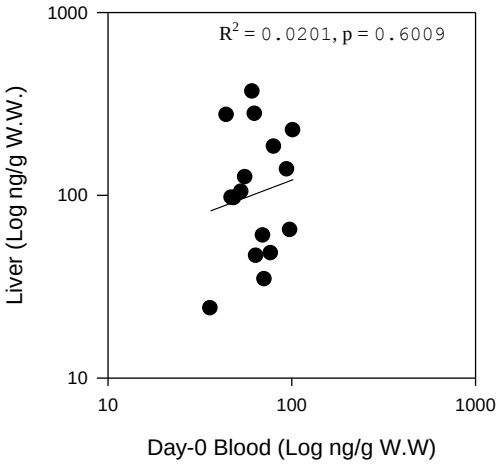
Day-7 Blood (Log ng/g W.W.)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10
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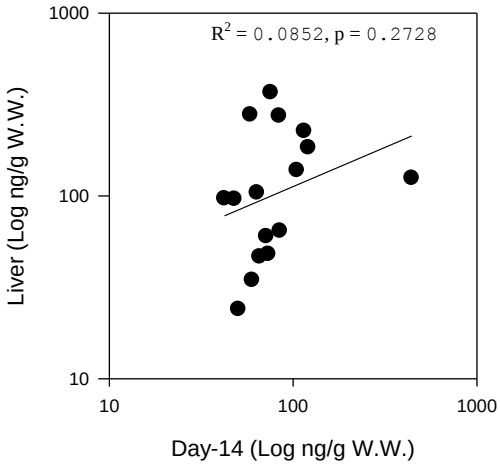
Liver (Log ng/g W.W.)
Day-0 Blood (Log ng/g W.W)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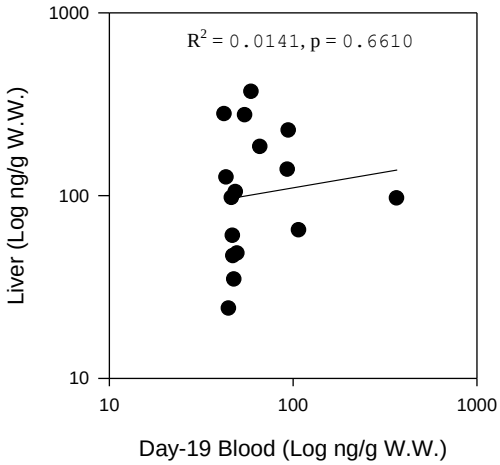
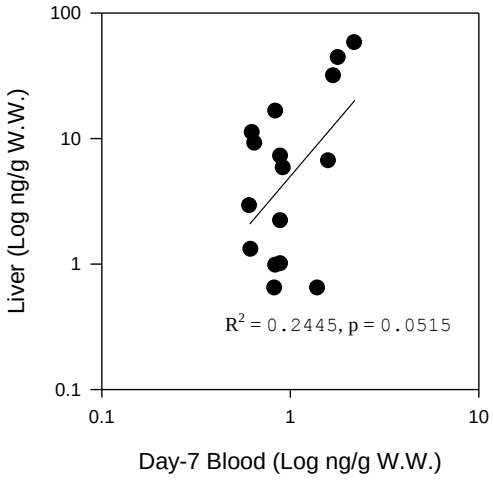
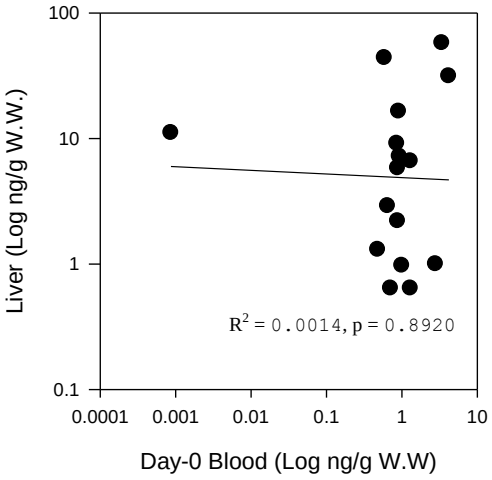
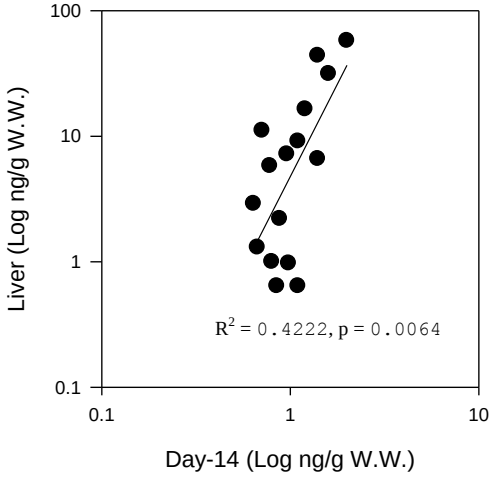
Liver (Log ng/g W.W.)
Day-14 (Log ng/g W.W.)

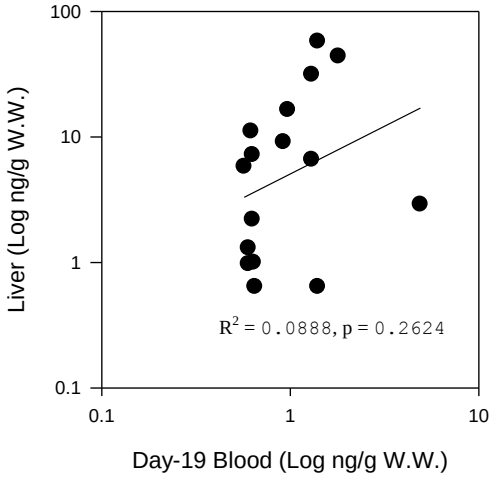

R2 = 0.0141, p = 0.6610
1000
100
10
10
100
1000
Liver (Log ng/g W.W.)
Day-19 Blood (Log ng/g W.W.)

Dieldrin

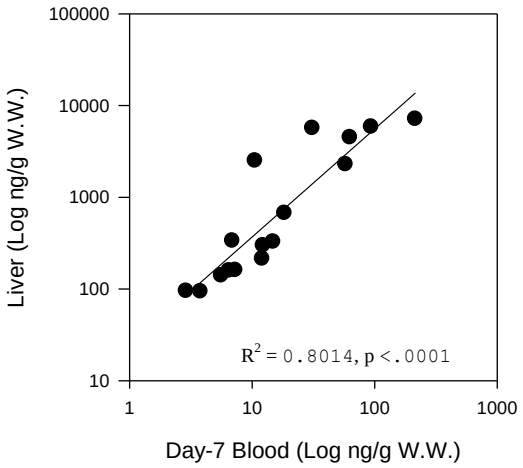

Liver (Log ng/g W.W.)
100
10
1
0.1
0.1
1
10
R^2 = 0.2445, p = 0.0515
Day-7 Blood (Log ng/g W.W.)

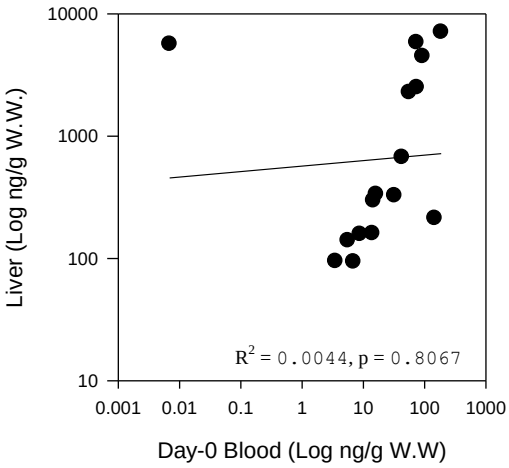

Liver (Log ng/g W.W.)
100
10
1
0.1
0.0001
0.001
0.01
0.1
1
10
R^2 = 0.0014, p = 0.8920
Day-0 Blood (Log ng/g W.W)

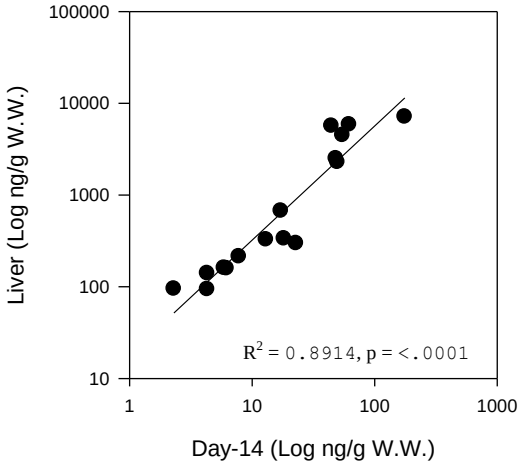

Liver (Log ng/g W.W.)
100
10
1
0.1
0.1
1
10
R^2 = 0.4222, p = 0.0064
Day-14 (Log ng/g W.W.)

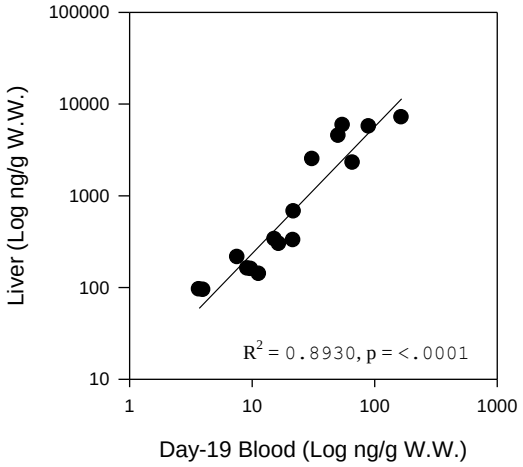

Liver (Log ng/g W.W.)
100
10
1
0.1
0.1
1
10
R^2 = 0.0888, p = 0.2624
Day-19 Blood (Log ng/g W.W.)

DDE

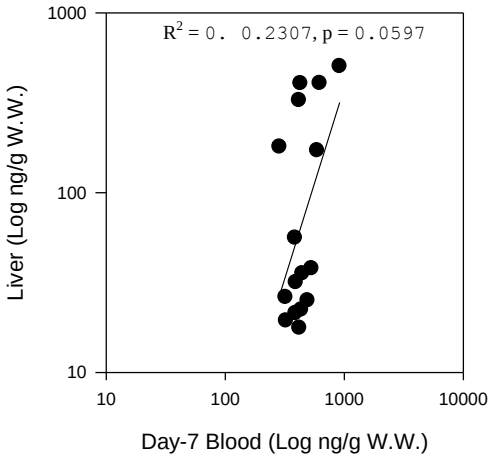

100000
10000
1000
100
10
Liver (Log ng/g W.W.)
R^2 = 0.8014, p <.0001
1
10
100
1000
Day-7 Blood (Log ng/g W.W.)

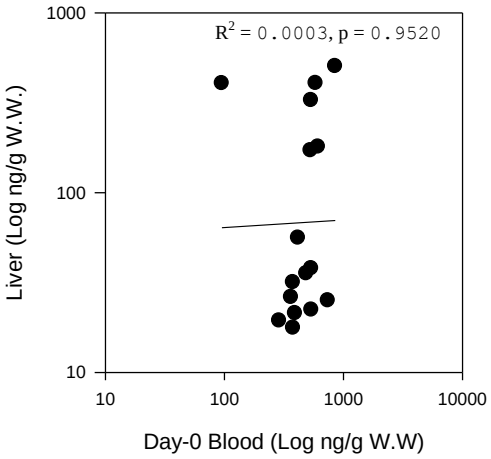

10000
1000
100
10
Liver (Log ng/g W.W.)
R^2 = 0.0044, p = 0.8067
0.001
0.01
0.1
1
10
100
1000
Day-0 Blood (Log ng/g W.W)

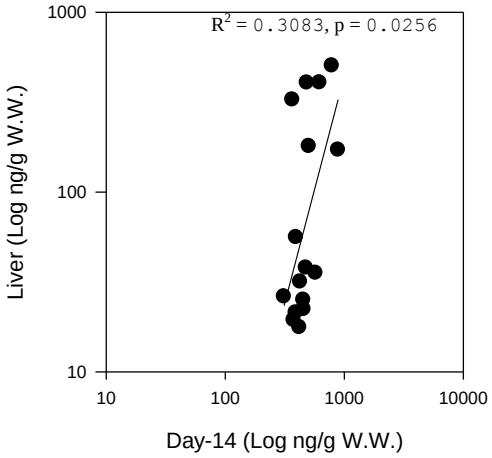

100000
10000
1000
100
10
Liver (Log ng/g W.W.)
R^2 = 0.8914, p = <.0001
1
10
100
1000
Day-14 (Log ng/g W.W.)


100000
10000
1000
100
10
Liver (Log ng/g W.W.)
R^2 = 0.8930, p = <.0001
1
10
100
1000
Day-19 Blood (Log ng/g W.W.)

Total OCPs


R^2 = 0. 0.2307, p = 0.0597
Liver (Log ng/g W.W.)
1000
100
10
10
100
1000
10000
Day-7 Blood (Log ng/g W.W.)


R^2 = 0.0003, p = 0.9520
Liver (Log ng/g W.W.)
1000
100
10
10
100
1000
10000
Day-0 Blood (Log ng/g W.W)


R^2 = 0.3083, p = 0.0256
Liver (Log ng/g W.W.)
1000
100
10
10
100
1000
10000
Day-14 (Log ng/g W.W.)

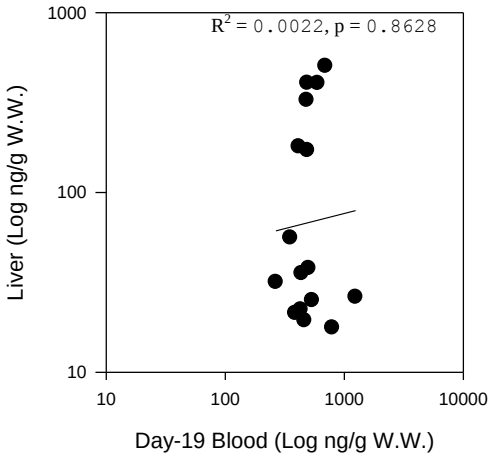
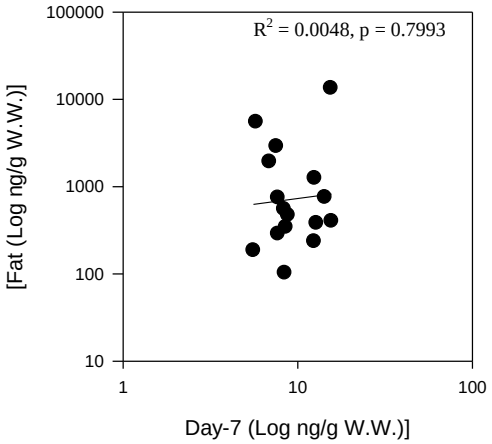
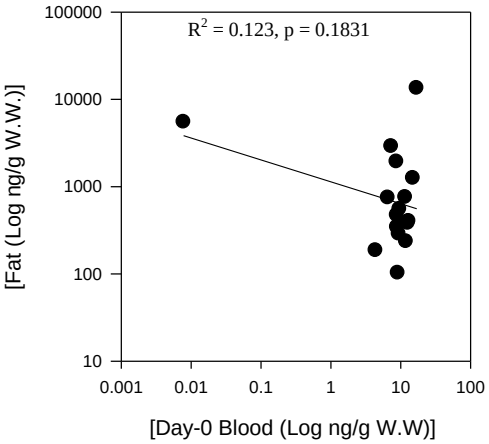
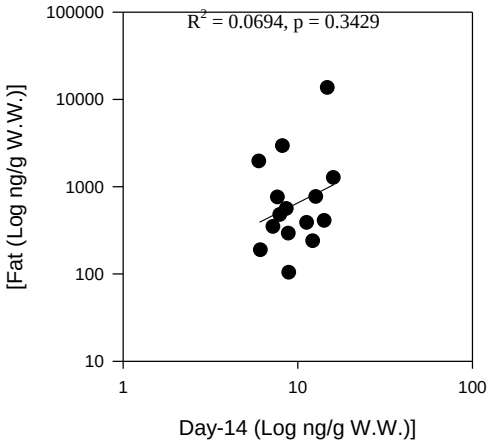

R^2 = 0.0022, p = 0.8628
Liver (Log ng/g W.W.)
1000
100
10
10
100
1000
10000
Day-19 Blood (Log ng/g W.W.)

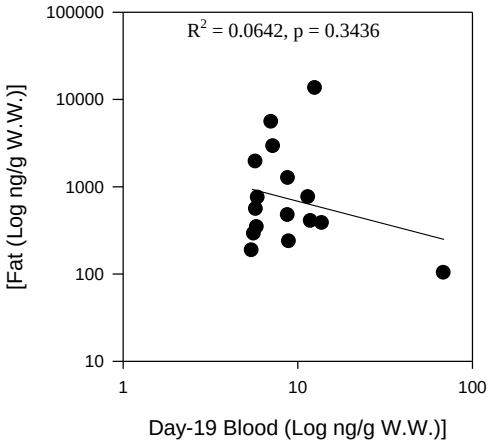
Figure 7. Linear regression of OCP blood concentrations (log ng/g ww) and fat OCP concentrations (log ng/g ww).

Total Chlordane

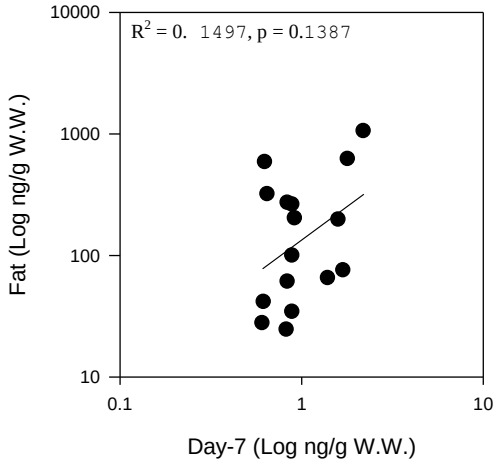


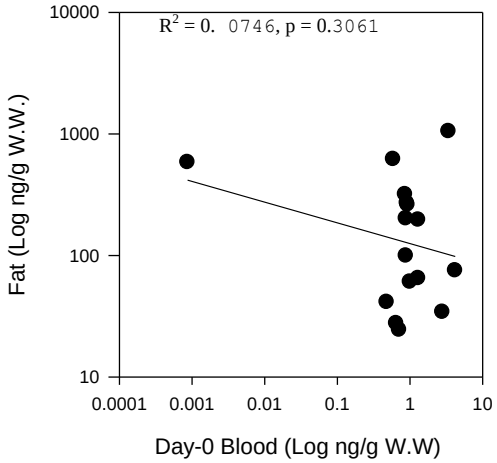


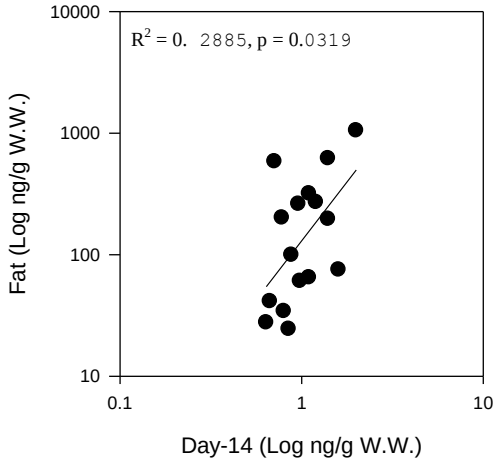


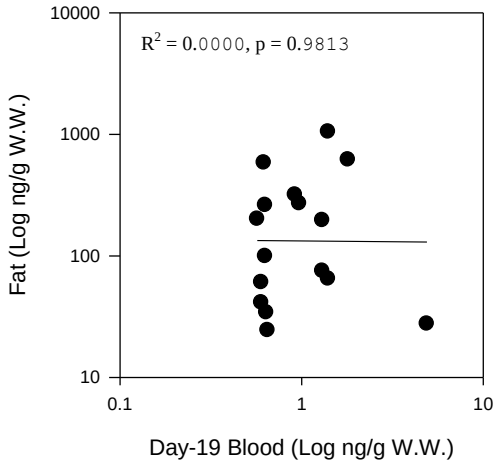


Dieldrin

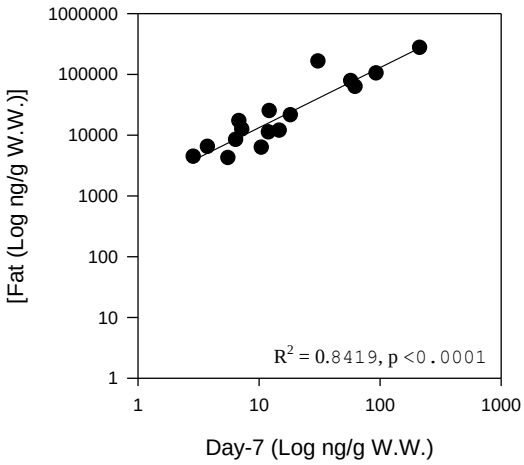

R^2 = 0. 1497, p = 0.1387
Fat (Log ng/g W.W.)
10000
1000
100
10
0.1
1
10
Day-7 (Log ng/g W.W.)

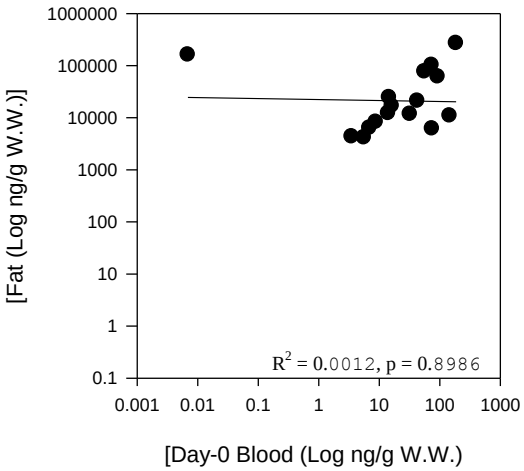

R^2 = 0. 0746, p = 0.3061
Fat (Log ng/g W.W.)
10000
1000
100
10
0.0001
0.001
0.01
0.1
1
10
Day-0 Blood (Log ng/g W.W)

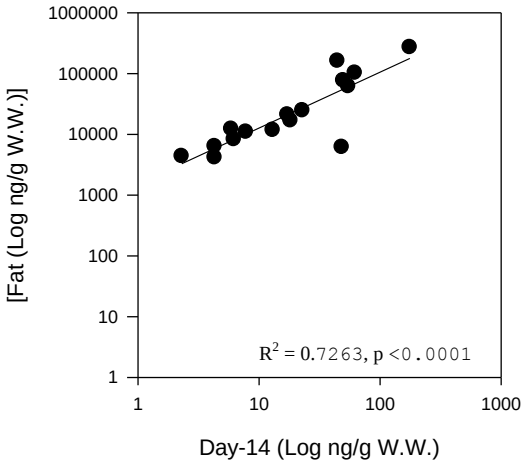

R^2 = 0. 2885, p = 0.0319
Fat (Log ng/g W.W.)
10000
1000
100
10
0.1
1
10
Day-14 (Log ng/g W.W.)

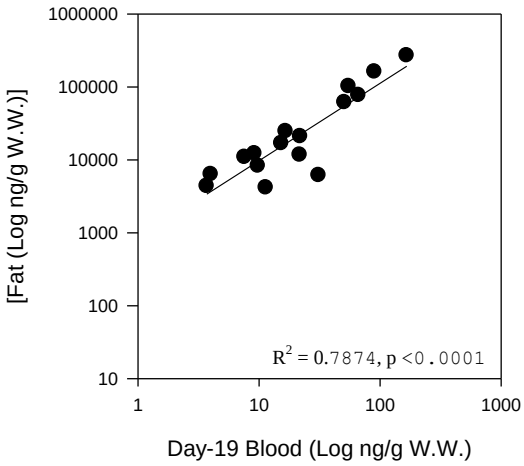

R^2 = 0.0000, p = 0.9813
Fat (Log ng/g W.W.)
10000
1000
100
10
0.1
1
10
Day-19 Blood (Log ng/g W.W.)

4,4-DDE

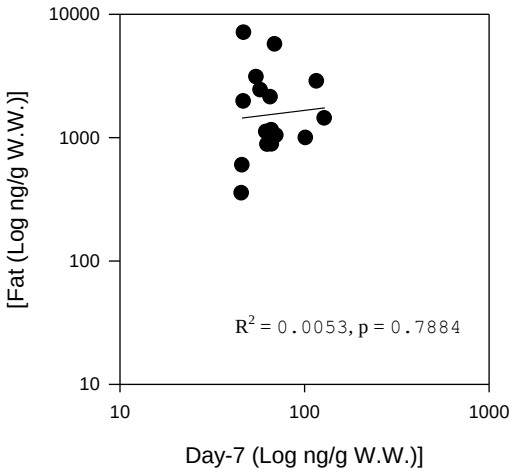

[Fat (Log ng/g W.W.)]
1000000
100000
10000
1000
100
10
1
1
10
100
1000
R^2 = 0.8419, p <0.0001
Day-7 (Log ng/g W.W.)

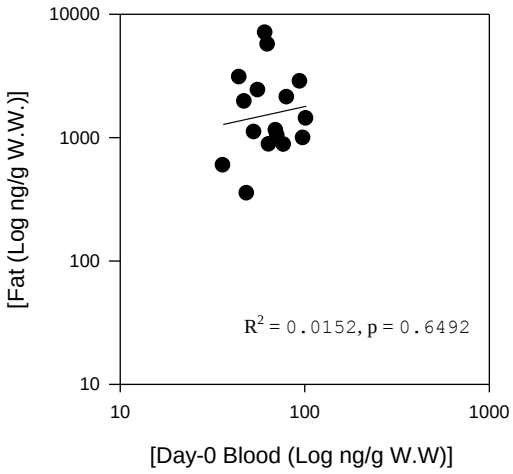

[Fat (Log ng/g W.W.)]
1000000
100000
10000
1000
100
10
1
0.1
0.001
0.01
0.1
1
10
100
1000
R^2 = 0.0012, p = 0.8986
[Day-0 Blood (Log ng/g W.W.)

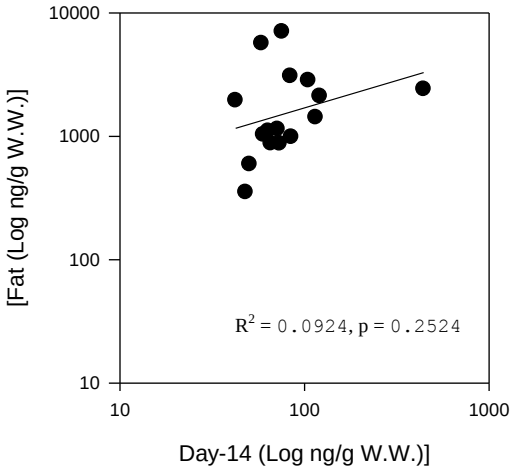

[Fat (Log ng/g W.W.)]
1000000
100000
10000
1000
100
10
1
1
10
100
1000
R^2 = 0.7263, p <0.0001
Day-14 (Log ng/g W.W.)

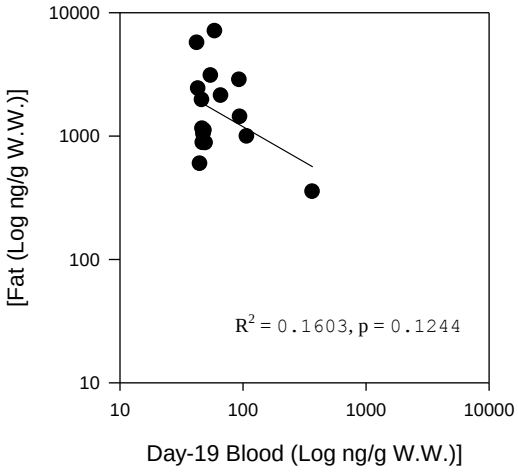

[Fat (Log ng/g W.W.)]
1000000
100000
10000
1000
100
10
1
10
100
1000
R^2 = 0.7874, p <0.0001
Day-19 Blood (Log ng/g W.W.)

Toxaphene

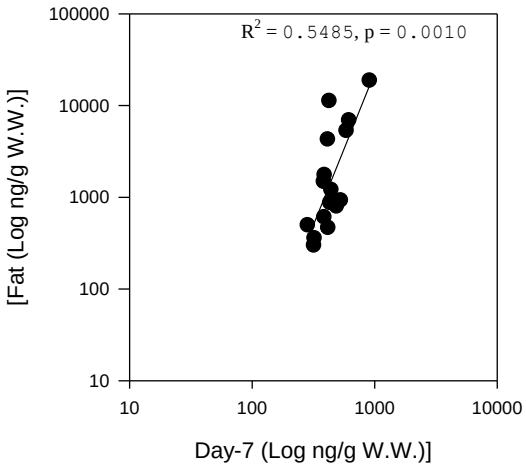

10000
1000
100
10
[Fat (Log ng/g W.W.)]
R^2 = 0.0053, p = 0.7884
10
100
1000
Day-7 (Log ng/g W.W.)]

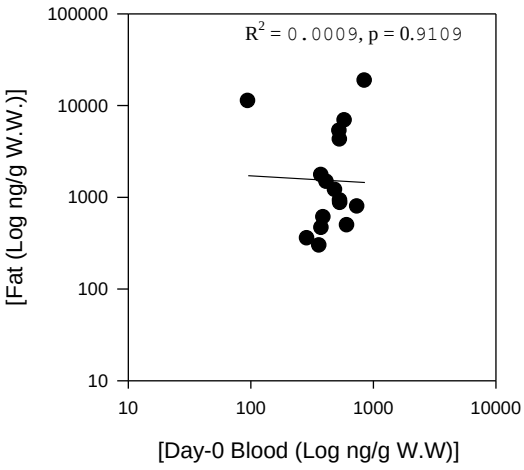

10000
1000
100
10
[Fat (Log ng/g W.W.)]
R^2 = 0.0152, p = 0.6492
10
100
1000
[Day-0 Blood (Log ng/g W.W)]

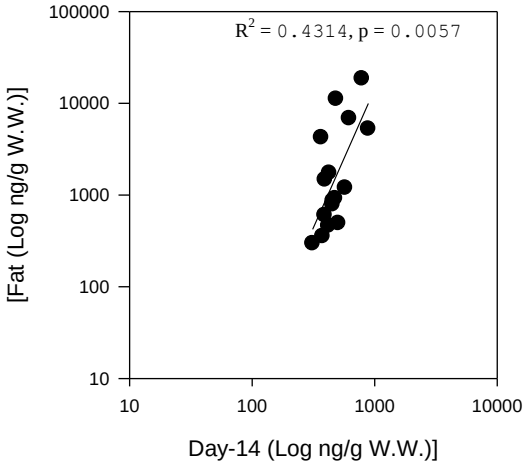

10000
1000
100
10
[Fat (Log ng/g W.W.)]
R^2 = 0.0924, p = 0.2524
10
100
1000
Day-14 (Log ng/g W.W.)]

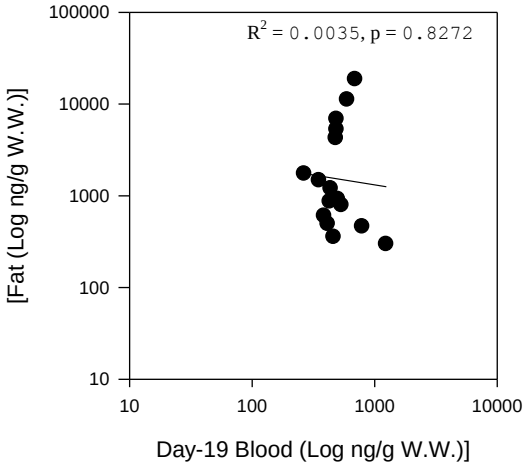

10000
1000
100
10
[Fat (Log ng/g W.W.)]
R^2 = 0.1603, p = 0.1244
10
100
1000
10000
Day-19 Blood (Log ng/g W.W.)]

Total OCPs


R^2 = 0.5485, p = 0.0010
[Fat (Log ng/g W.W.)]
Day-7 (Log ng/g W.W.)]
100000
10000
1000
100
10
10
100
1000
10000


R^2 = 0.0009, p = 0.9109
[Fat (Log ng/g W.W.)]
[Day-0 Blood (Log ng/g W.W)]
100000
10000
1000
100
10
10
100
1000
10000


R^2 = 0.4314, p = 0.0057
[Fat (Log ng/g W.W.)]
Day-14 (Log ng/g W.W.)]
100000
10000
1000
100
10
10
100
1000
10000


R^2 = 0.0035, p = 0.8272
[Fat (Log ng/g W.W.)]
Day-19 Blood (Log ng/g W.W.)]
100000
10000
1000
100
10
10
100
1000
10000

DISCUSSION

We concluded that blood from alligators fasted for seven days or more may be a useful, noninvasive method for estimating fat and liver concentrations for 4,4'-DDE. In addition, a 14-day fast may also allow blood to be a useful indicator of dieldrin levels in body fat. For the animals included in our study, fasting does not appear to increase the linear association between blood concentrations and fat and liver concentrations for other analytes. The original plan was to collect five alligators from each impoundment, but due to low water levels in the Duda unit we were not able to collect a balanced sample. It is possible that no fasting period would be needed for blood samples collected in the dormant season because lipid levels already might be reflective of body fat OCP concentrations because animals naturally do not eat during that time.

Since this ancillary study was done in 2008, we used blood tissue from alligators fasted for 7 days for our subsequent OCP sampling. This sampling technique was beneficial to our study because it eliminated the need to sacrifice study animals from sparse populations. It may also be a beneficial non-lethal technique to use on threatened crocodilian species.

LITERATURE CITED

Campbell, K.R. 2003. Ecotoxicology of crocodilians. Applied Herpetology 1:45-163.

Rauschenberger, R. H., J. J. Wiebe, J. E. Buckland, J. T. Smith, M. S. Sepúlveda, and T. S. Gross. 2004. Achieving environmentally relevant organochlorine pesticide concentrations in eggs through maternal exposure in *Alligator mississippiensis*. Marine Environmental Research 58:851-856.

APPENDIX I
APPLICATION OF STOMACH LAVAGE ON JUVENILE ALLIGATORS

INTRODUCTION

The main idea behind the NSRA alligator project was to investigate the feasibility of using juvenile alligators to monitor OCP levels. Risk to wading birds is a primary management concern for the SJRWMD so we were especially interested in comparing juvenile alligators to wading birds. One assumption of this project is that juvenile alligators and wading birds bio accumulate contaminants the same way, mostly because they have the same prey base. We did a pilot study on juvenile American Alligators in Lake Apopka to determine whether the juvenile alligators there were consuming the same prey items as wading birds. Most feeding habit studies done on alligators were found obtaining their stomach samples post-mortem (Rice et al 2005). There are three common methods of obtaining stomach samples from live specimens. The irrigation method which flush out samples (Fitzgerald 1989; Taylor et al 1978), invasive scoops which retrieve material through the esophagus (Taylor et al 1978), and a combination of these two techniques (Webb et al 1982).

MATERIALS AND METHODS

The Alligators in our study ranged in size from 90cm to 172cm in total length. They were captured by hand grabbing off the front of an airboat. Biological data was recorded along with a web tag number. Ten alligators were captured in Phase I and 10 were captured in the West Marsh.

We used the modified hose- Heimlich technique performed by Rice et al. (2005). A 3.81cm or 5.08 cm piece of PVC pipe 19.35 cm long was inserted into its mouth, and secured with tape. On the alligators 142cm to 172cm in length we used the larger 5.08 cm PVC pipe, and for the smaller alligators 90cm to 141cm in length we used the smaller 3.81 cm PVC pipe.

We used two clear, mesh reinforced, flexible pieces of vinyl tubing. Both were securely taped to the end of two regular garden hoses. The two flex hoses differed in size one was 1.91cm in diameter and 91.44 cm in length, and the other was 1.27 cm diameter and 91.44 cm in length. The ends of the hoses were shaved smooth so they would not irritate the esophagus. The larger 1.27cm flex hose was used on the larger alligators 142cm to 172cm in length, and the smaller 1.91 cm flex hose was used on the smaller alligators 90cm to 141cm in length.

The hose was coated in vegetable oil, and inserted into the esophagus of the alligator. We used a modified hose-Heimlich technique described by Rice et al. (2005) and flushed contents into a strainer over a five gallon bucket. The water in the five gallon bucket was emptied into the strainer, to obtain any part of the sample that may have escaped the first straining. The sample was then marked with the date and tag number of the animal, and placed in plastic vial. The samples were filled with formalin to stop any further breakdown by gastric juices. The alligators were kept overnight so they may be monitored while they recuperated, and then were released as close to their capture location as possible in shallow water. The samples were then sent to FWC, where we further analyzed the contents.

RESULTS

Table 1. Presence of food items in individual alligators from Phase 1 and the West Marsh. The proportion of each food type for the separate study units is also indicated.

		Classification							
Tag Number	**Unit**	**Fish**	**Mollusk**	**Arthropod**	**Herp**	**Insect**	**Parasite**	**Rock/Woody**	**Avian**
FWC32590	P1	0	1	0	0	1	1	1	1
FWC32589	P1	1	1	0	0	1	0	0	0
FWC32588	P1	0	1	0	0	1	1	1	1
FWC32587	P1	1	1	0	0	1	1	1	0
FWC32752	P1	0	0	0	0	1	0	0	1
FWC32586	P1	0	1	0	0	1	1	1	1
FWC32585	P1	0	1	1	1	1	1	1	0
FWC32584	P1	1	1	0	1	1	1	1	0
FWC32582	P1	1	1	1	0	1	1	1	0
FWC32583	P1	1	1	1	1	1	1	1	0
Total Proportion	P1	0.5	0.9	0.3	0.3	1	0.8	0.8	0.4
FWC32600	WM	0	0	0	1	1	1	1	0
FWC32599	WM	0	0	0	0	1	1	1	0
FWC32598	WM	0	0	1	0	1	1	1	0
FWC32597	WM	0	0	0	0	1	1	1	0
FWC32596	WM	1	0	0	0	1	1	1	0
FWC32595	WM	0	0	1	0	1	1	1	0
FWC32594	WM	0	0	1	0	1	1	1	0
FWC32593	WM	1	1	0	0	1	0	1	0
FWC32592	WM	0	0	1	0	1	1	1	0
FWC32591	WM	1	0	0	0	0	1	1	0
Total Proportion	WM	0.3	0.1	0.4	0.1	0.9	0.9	1	0

DISCUSSION

The juvenile alligators in the West Marsh and Phase I would appear to have plenty of forage from this pilot study. Of the 20 alligators we sampled, only one stomach did not produce contents, and it that particular animal had a bird in its mouth upon capture. The scope of contents found in this study was typical of contents found in juvenile alligators from other studies (Chabreck 1972, Delany 1990, Giles and Childs 1971). It would appear that alligators from Phase I had a greater variety of prey items than individuals from the West Marsh, and that crayfish are an important food source for individuals from the West Marsh. However, this is speculation due to the small sample size. Many precautions were taken to minimize stress and discomfort to the alligators during this study but we still incurred one mortality. A necropsy was done to determine cause of death but our findings were inconclusive.

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APPENDIX J
THE IMPACT ON THE SIGNAL STRENGTH OF RADIO TRANSMITTERS AFTER BEING INGESTED BY AN ADULT AMERICAN ALLIGATOR.

INTRODUCTION

Unknown fate of study animals is a source of uncertainty in radio telemetry projects. In most cases, when a study animal is preyed upon, and the radio-transmitter is ingested by the predator it is evacuated within a few days and the researcher is able to detect a "mortality" signal which is usually activated by lack of motion. However, in cases where the radio-transmitter is retained inside the digestive tract of the predator, the radio transmitter does not emit a mortality signal and the researcher must rely on empirical data to recognize such a mortality.

The American Alligator is a potential predator of any study species located in southeastern wetlands. Cannibalization within this species has been documented and is considered to be a significant source of mortality for juveniles (Delaney and Abercrombie 1986, Rootes and Chabreck 1993). Alligator research on the north shore marsh of Lake Apopka, Florida has been conducted over the past two years and involves tracking the movement of juvenile alligators using radio telemetry. It is suspected that one source of weak signal strength of the transmitter is caused by a larger alligator consuming the juvenile study animals. We assumed that if a study animal had been consumed by a larger alligator, the radio-transmitter would not be immediately evacuated, based on evidence that alligators retain debris in their stomach for some time (Delaney1987, Janes and Gutzke 2002). The radio-transmitter would not give a mortality signal if it was inside a larger alligator, so there was a possibility that we may not detect when one of our study animal was preyed upon. Our goal was to determine whether or not the ingestion of the radio transmitters by larger alligators causes weak signal strength and if we could fabricate a formula to indicate if there was a possibility that such an event had occurred.

We used two different antenna types for our telemetry study; a mobile hand-held receiving antenna is used in close range situations from a boat and a null-peak antenna mounted on a truck was used for tracking the alligators from land. The null-peak antenna can pick up a signal from farther away and is typically used for long-range tracking (Fuller et al. 2005). Radio transmitters weigh approximately 63 grams, send a regular signal of 40 pulses per minute (ppm) and a mortality signal of 80 ppm after 24 hours of no movement.

The signal strength has been variable in this research and can be very strong or very weak. These varying signal strengths may be caused by an alligator that has submerged, moved, or been consumed by a predator. Mortality signals are picked up when a transmitter has not moved from a spot for over 24 hours, and it is assumed that the study animal has died or the transmitter has fallen off. These signals are detected by rapid beeping caused by a transmitter's immobility.

METHODS

The telemetry materials used in this experiment were all purchased from Advanced Telemetry Systems in Isanti, Minnesota. The Null-Peak system was a matched set of two 4-element Yagi antennas configured about 6 feet apart on a horizontal boom and we used the 'peak' setting for

all tests. The receiving device was a R1000 model and the transmitters were 7.5 x 4.3 x 3 cm; 63 g in size.

Alligators (228-270 cm) were captured in the West Marsh using a snatch hook on a fishing pole. Eyes were covered with duct tape to help minimize stress, and we recorded standard biological measurements. Study alligators (n=4) were transported by to the work site at the SJRWMD Apopka field station. Each alligator was secured to a wooden board and their mouths propped open with a section of PVC pipe. The transmitter was coated with baby oil and gently pushed down the throat and into the stomach with a long, narrow rod. This method of force feeding should not have negative effects on the alligator, since the transmitter used was small, and an alligator esophagus can widen to accommodate large prey (Hentz 1825). We used the fourth whirl of scutes anterior to the hind legs as an external marker for the posterior end of the stomach to attain correct placement of the transmitter. A string was attached to the transmitter with the other end secured to the alligator's snout for easy removal of the transmitter.
Once the transmitters were placed in the stomachs, we took them back to the study marsh.

Once in the water, each alligator was controlled with a rope to ensure the alligator would not escape or drown. A truck with the radio antennas was on a levy next to the marsh. From the truck, the readings of the transmitter signals were taken and recorded at 100 m intervals (starting at 0 m) to test signal strength vs. distance, as well as signal strength above and below the water's surface for each alligator. Signals were measured with peak signals using both the hand-held and truck-mounted antennas. There were double readings taken at each stop by two people to reduce error in determining signal strength. We compared the ingested transmitter signal to the signal of a transmitter that has not been ingested. These signals were compared at each distance, below and above the water's surface. This helped us to determine whether the ingested transmitter is giving us a strong or weak signal. A signal is considered strong or weak depending on the number of bars present on the receiving device. Zero was considered a "weak" signal, and seven bars were considered "strong."

To retrieve the transmitter from each alligator's stomach, we slowly and gently pulled the string to get the transmitter out. If the transmitter stopped pulling free, we used the hose-Heimlich maneuver (Fitzgerald 1989) and continued gently tugging the string attached to the transmitter until it came free. Flushing at the same time allowed for easier removal and minimal discomfort for the alligator. The alligator was allowed to rest and regain its strength before being released into shallow water close to its capture site.

To analyses data, we built a model in SAS (v9.2) that used generalized linear mixed models (PROC GLIMMIX). The raw data (signal 0-7) were not normally distributed so they were transformed to signal strength by dividing the raw signal by the maximum value (7) to create a new range (0-1) which allows the modeling of a beta distribution. Antennae-type, distance to alligator, submersion, and location were all included as fixed parameters and alligator ID was included as a random parameter since each animal was tracked according to each of the fixed parameters (with the exception of location). Distance was included as a continuous variable while all other were categorical. In addition mean estimates were calculated for each fixed effect combination.

Table 1. Data table containing each alligator's size measurements.

	Total Length	Snout-Vent Length	Tail Girth	Head Length
Alligator 1	231.5 cm	119.7 cm	60.6 cm	31.9 cm
Alligator 2	270.3 cm	136.5 cm	68.9 cm	36.1 cm
Alligator 3	228.4 cm	119.9 cm	54.6 cm	30.0 cm
Alligator 4	244.6 cm	127.8 cm	61.5 cm	34.3 cm

RESULTS

We tested the effects of antenna type, distance, submersion in water, and ingestion by large alligator on radio transmitter signal strength. There was no significant effect on signal strength between antenna types (P> 0.157) or submersion in water (P> 0.2029). Distance, of course, had a significant effect on signal strength (P> 0.0013), as did the ingestion by large alligator (P>0.0014). Figures 1-3 display the rate of signal strength loss over distance in relation to other effects.

Table 2. Generalized linear mixed model probabilities of various effects of radio transmitter strength.

Effect	**Num DF**	**Den DF**	**F-value**	**Pr > F**
ANT	1	30	2.1	0.1573
Distance	1	30	12.53	0.0013
Surface	1	30	1.69	0.2029
Stomach	1	30	12.36	0.0014

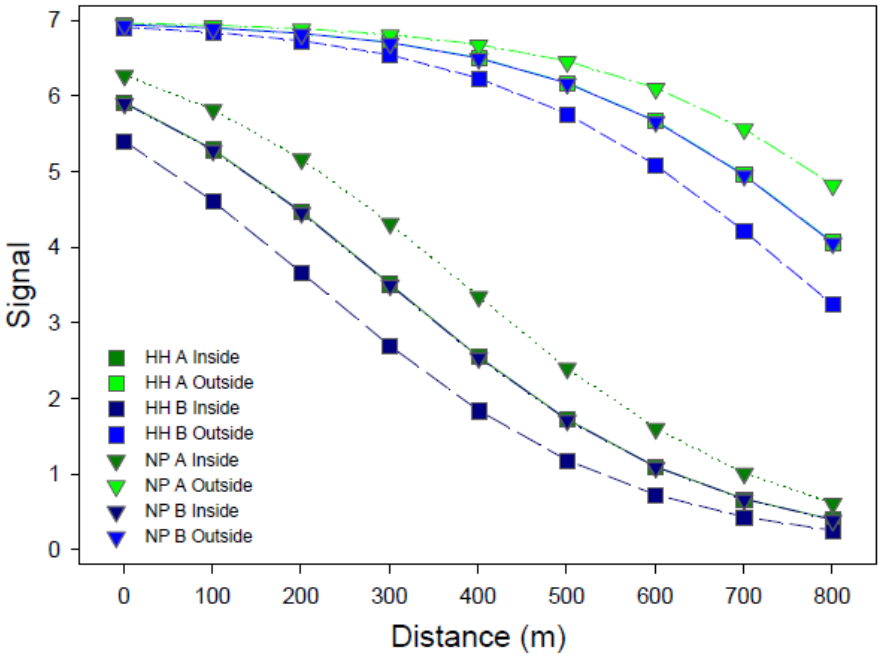

Figure 1 Signal according to distance, antennae-type (HH, NP), submersion (A, B), and location (inside, outside).

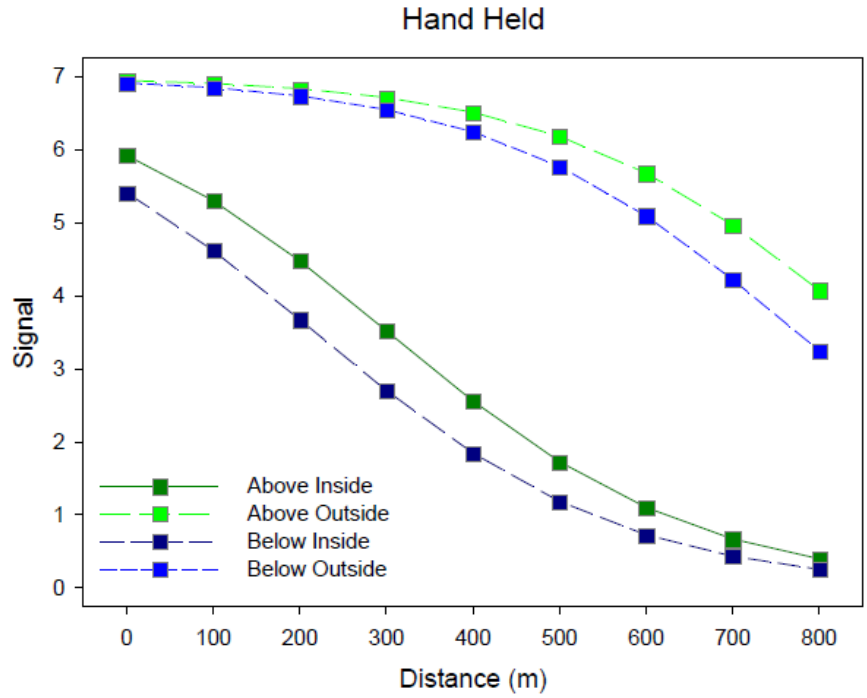

Figure 2 Hand held signal according to submersion (above, below) and location (inside, outside).

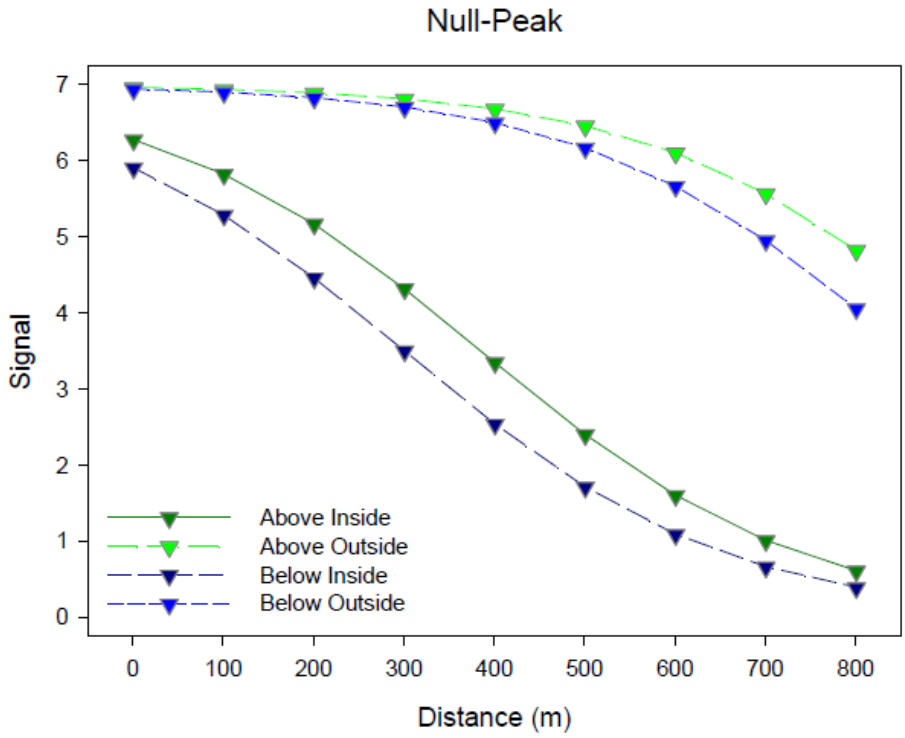

Figure 3 Null peak signal according to submersion (above, below) and location (inside, outside).

DISCUSSION

The purpose of doing this experiment was to determining if radio-transmitter signal strength was affected when ingested by a large alligator and to fabricate some formula that would give us an indication if this event occurred. Our results suggest that there is a significant effect on radio-transmitters that have been ingested by larger alligators. It also suggests that the particular equipment being used (hand held antenna vs. null-peak antenna) was not a significant factor affecting signal strength. Radio-transmitters below the water's surface do not have as good of signal range as radio-transmitters above the surface, but submersion in water is not a significant factor to consider when investigating the cause of an abnormally weak signal. Based on the signal strength of the control transmitters (outside the alligator) we have a baseline for what normal signal strength is and signal strength transmitted by ingested radios. In the event of an abnormally weak radio-transmission, the signal strength and distance can be compared to that of the signal strength and distance in Figure 1 to assess the possibility that the study animal was consumed by a large alligator. We do not recommend that these findings be used to determine absolute predation by large alligators, but rather as an indicator of when the status of a given study animal should be investigated.

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APPENDIX K
SOIL TYPES WITHIN THE NSRA

Gator muck soils- nearly level and poorly drained. They were associated with freshwater shrub marshes north of Lake Apopka; however, most of these were converted to agricultural lands. Typically the first 71 (28 in) consist of black muck followed by a dark olive gray fine sandy loam of 94 cm (37 in). Under normal conditions, the water table is at or above the surface except during periods of extended drought.

Terra-Ceia muck soils- co-dominant with Gator soils on the Orange County portion of the restoration area. These soils are nearly level and very poorly drained. This soil has an organic layer of black muck about 23 cm (9 in) thick turning to a dark brown muck to approximately 188cm (74 in). Under normal conditions the water table is at or above the surface for most of the year except during extended dry periods. Under natural conditions these soils are associated with marshes and swamps.

Canova muck soils- nearly level and poorly drained. There is an organic layer of black muck about 15 cm (6 in) thick. The surface layer, to a depth of 23 cm (9 in) is very dark gray fine sand. The subsurface layer to 40 cm (16 in) is gray fine sand. These soils are associated with marshes along the north shore of Lake Apopka.

*These soil definitions were extracted from the Lake Apopka Restoration Area Management Plan, 2006.