Progress at a Turtle's Pace: the Lake Jackson Ecopassage Project

Matthew J. Aresco, Ph.D.
Lake Jackson Ecopassage Alliance

State Road No. 1, Crossing Lake Jackson near Tallahassee

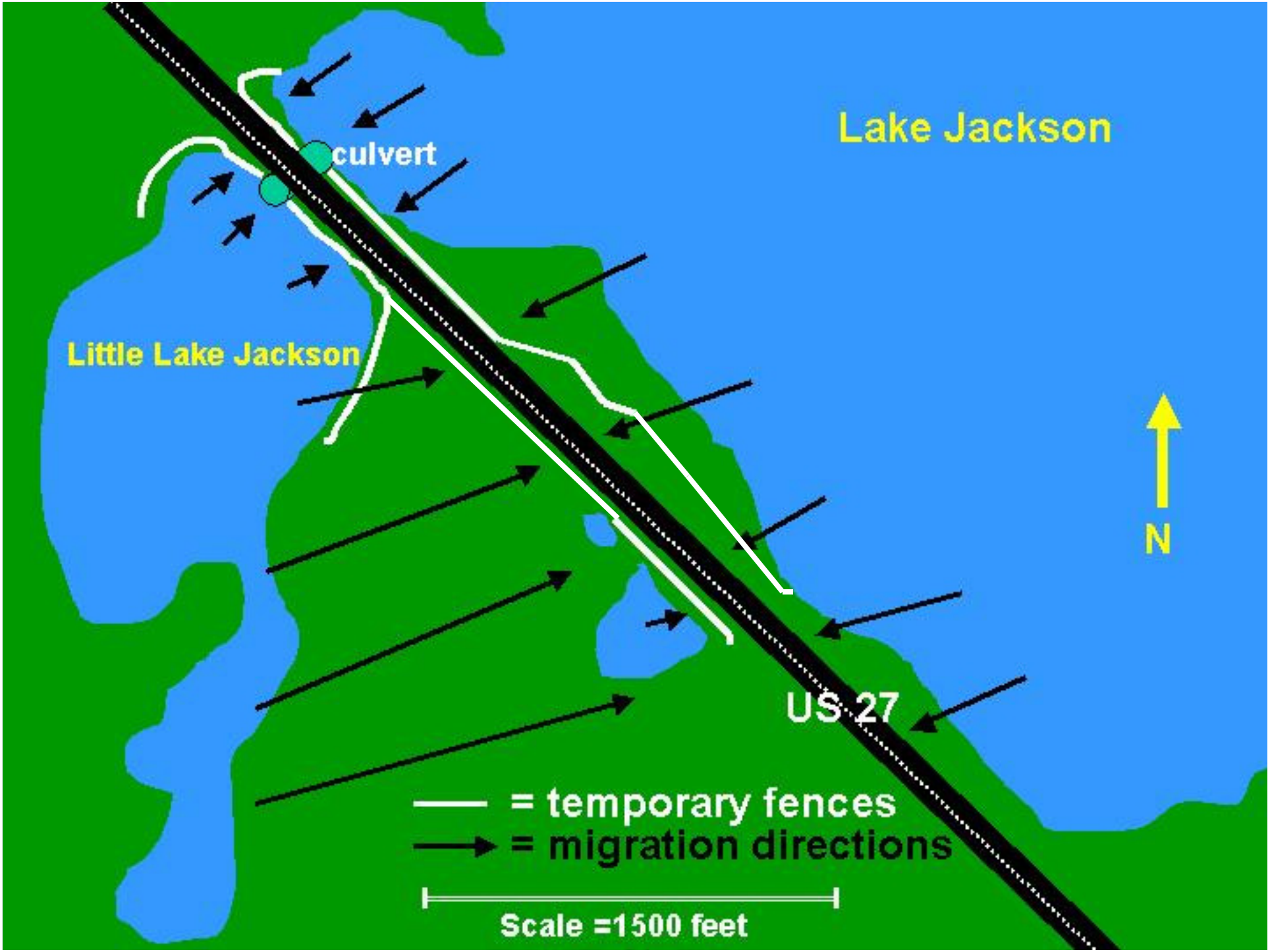

TOWER RD
DAYS HOOL
562-0489

90 DOR turtles on 1/3 mile of US 27, February 2000
This photo was sent to FDOT and Leon County

Lake Jackson

Little Lake Jackson

367 turtles killed in 40 days
Feb-March 2000

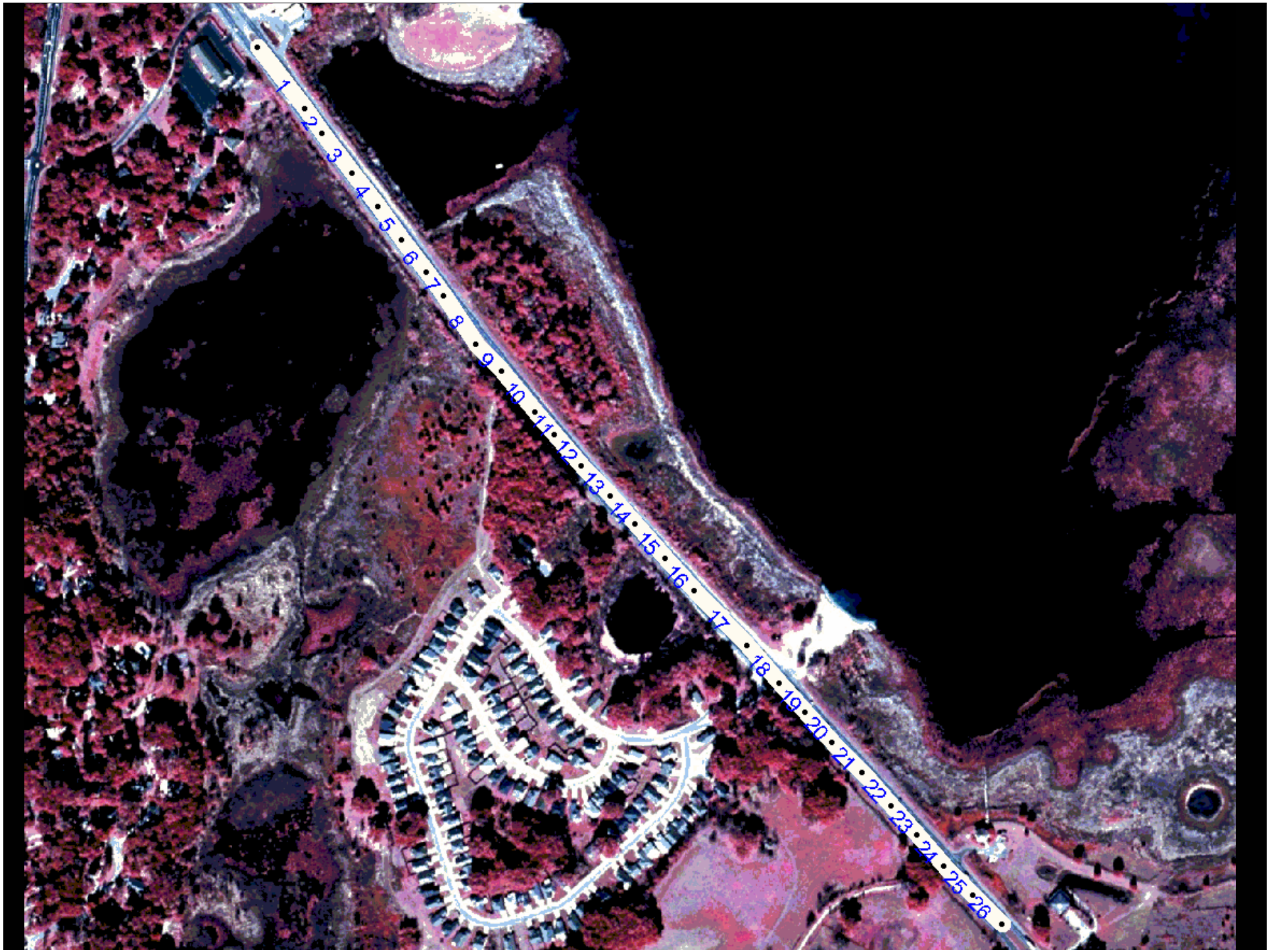

Lake Jackson
culvert
Little Lake Jackson
N
US 27
= temporary fences
= migration directions
Scale =1500 feet

Data Collection

- Daily surveys of 1.2 km of highway
  - Prior to fence construction (22 Feb - 3 Apr 2000)
  - Fence construction - 1000 m of 0.6 m silt fence along US27N (April 2000) and US27S (Sept 2000)
  - Post fence construction (4 Apr 2000-31 July 2006)
- 77 consecutive months (2098 sampling days)
  - Total sampling hours = 7061 h
  - 2000-2001 - 4 times daily
  - 2002-2006 - 2 times daily
- Counted all individuals of all vertebrate species on road or behind fences
- Transported migrating turtles to other side of road
- Monitored culvert use


GMC

- Marked 15% turtles captured
- Recapture rates used to estimate the total number of individual turtles encountered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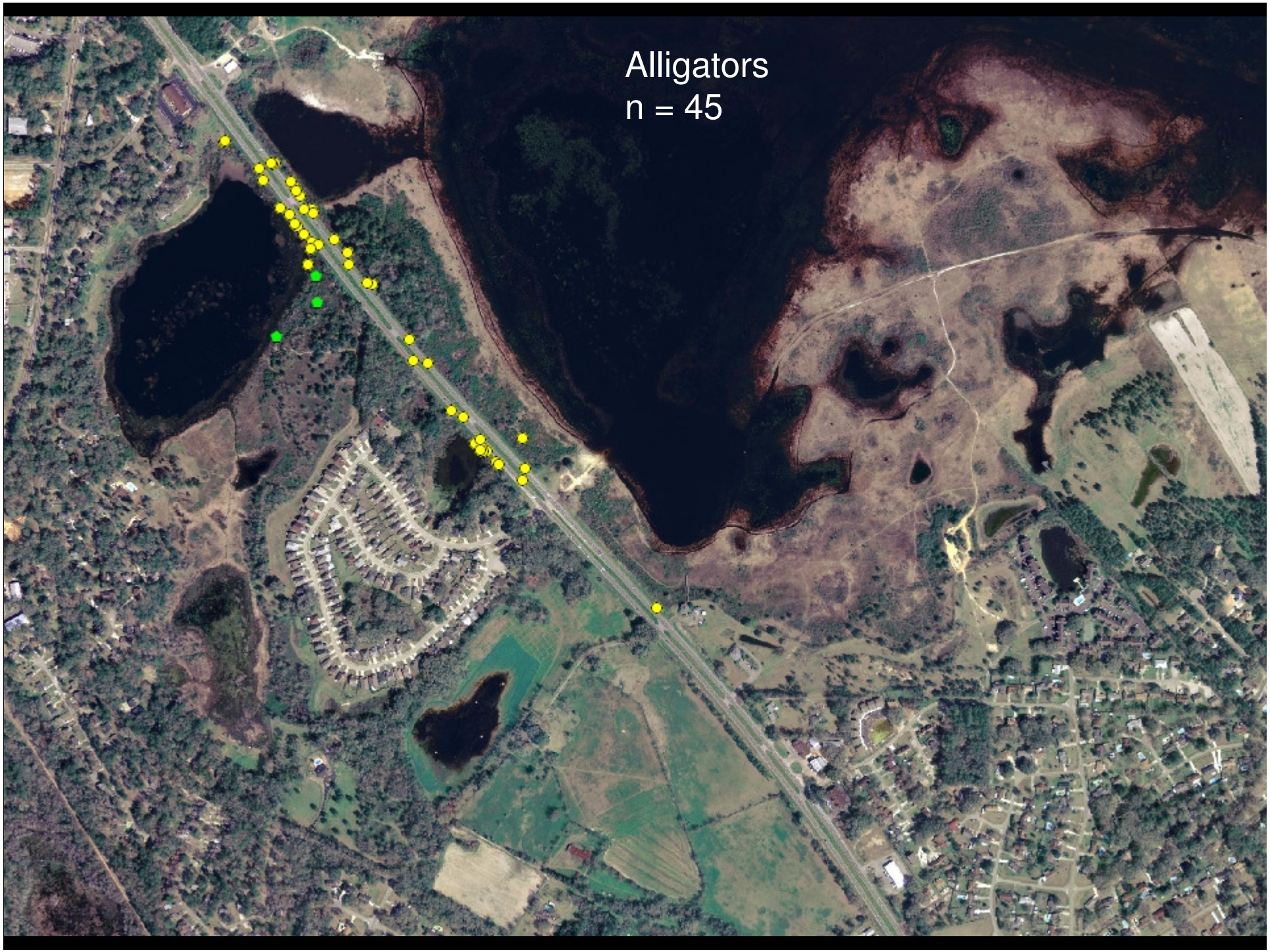
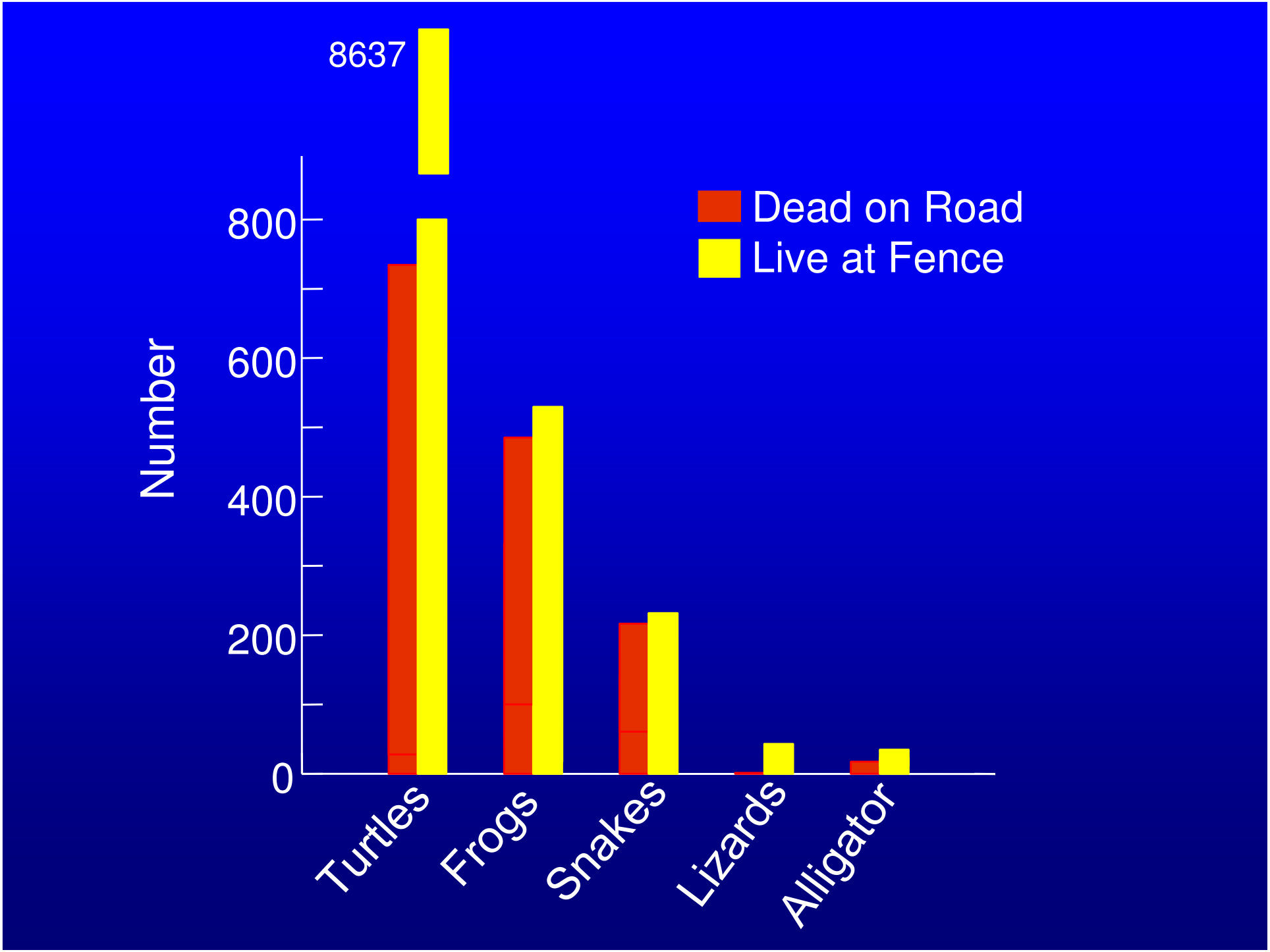

Alligators
n = 45

Results Summary

- 11,267 reptiles and amphibians (dead or alive) of 45 species in 7 years
- 9439 turtles of 11 species (8837 saved by the fences)
- Other herps - 1198 aquatic and 564 terrestrial
- 17 species of mammals DOR
- 27 species of birds DOR
- Recaptured 34% of 1300 marked turtles
- Estimated 3000 turtles were captured twice (during both the 2000 initial and 2001 return migrations) and total number of individual turtles encountered was approximately 5825.


8637
800
600
400
200
0
Number
Dead on Road
Live at Fence
Turtles
Frogs
Snakes
Lizards
Alligator

Yellow-bellied slider,
Trachemys scripta

n=4247

Florida cooter,
Pseudemys floridana

n=3806

Common musk turtle (*Sternotherus odoratus*) n=873

Florida softshell (*Apalone ferox*) n=312

Mud turtle (*Kinosternon subrubrum*) n=102

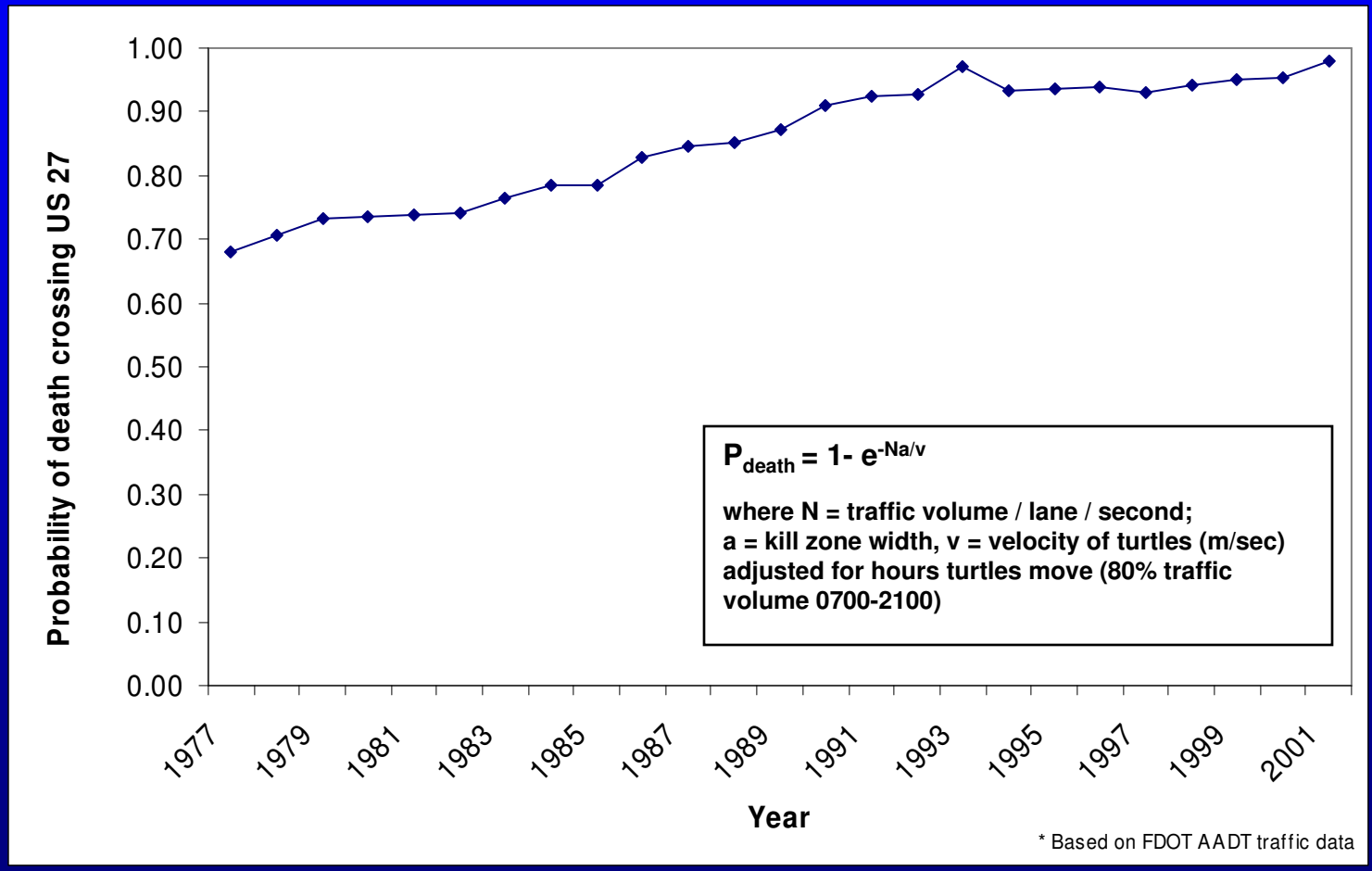
Box turtle (*Terrapene carolina*) n=59

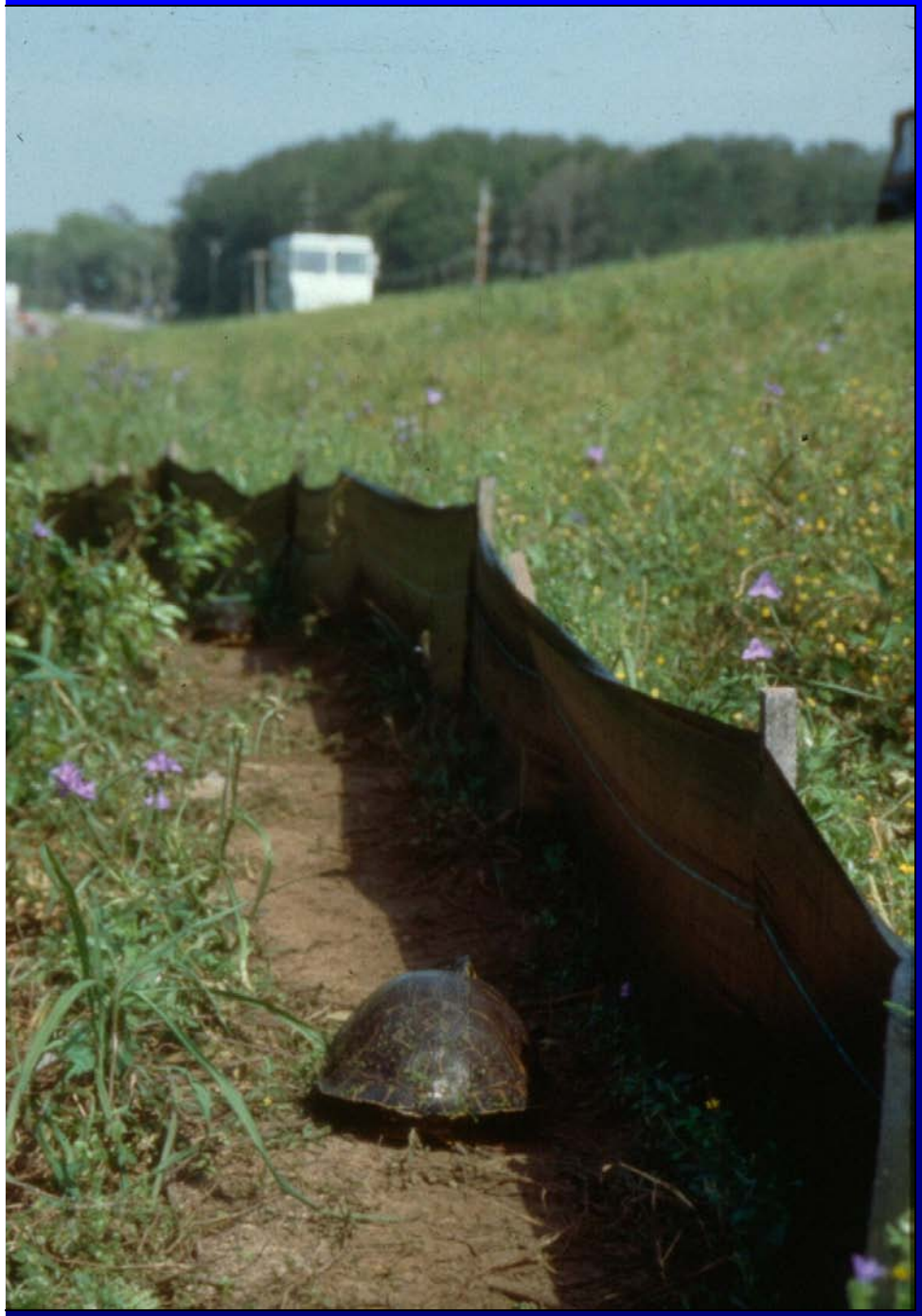
Efficacy of the fences at reducing roadkill rate (2000-2003)

Pre-fence = 11.9 turtles/km/day (99-100% of turtles attempting to cross were killed)

Post-fence = 0.09 turtles /km/day (<1% of turtles attempting to cross were killed)

Annual change in probability of turtle being killed by vehicle attempting to cross U.S. 27 as a function of traffic volume, 1977-2001.





Female turtles attracted to roadside habitats for nesting

Male biased sex ratios of turtle populations at Lake Jackson due to chronic annual mortality of nesting females

Species	Male	Female	% Males
Slider	1478	539	73%
Florida cooter	1386	350	80%
Musk turtle	293	156	65%

Note: slider and cooter have different mode of TSD than musk turtle

Biased Sex Ratios

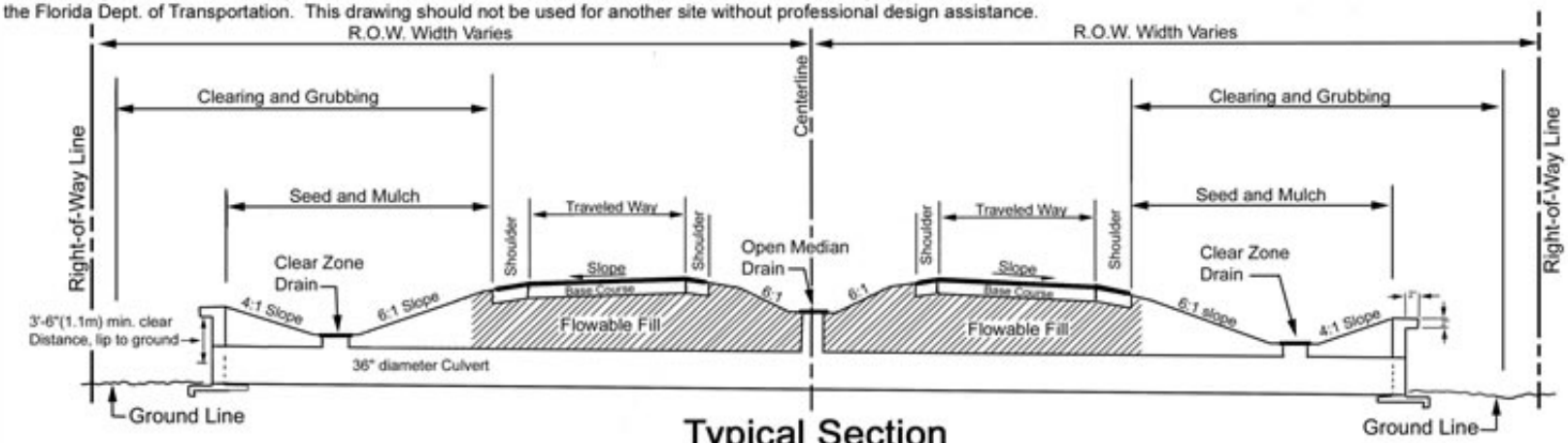
- Sex ratios of 3 turtle species significantly male-biased compared to nearby ponds and probably due to chronic annual road mortality of nesting females
- During non-drought conditions, females move overland more frequently than males and have a greater probability of being killed by vehicles
- Female turtles attracted to artificial nesting habitat of highway edges
- Roads are ecological traps for female turtles

Conservation implications of road mortality

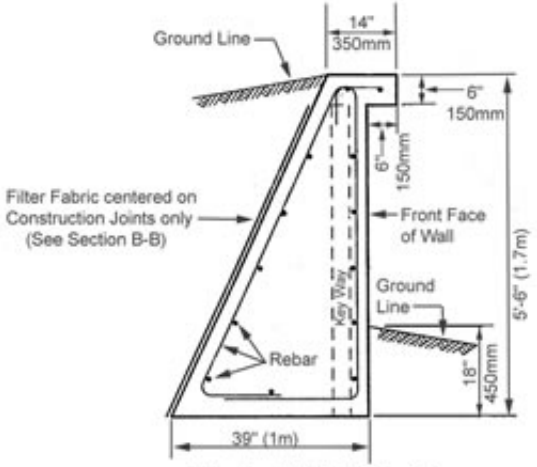
- Turtle life history traits – long generation times, late sexual maturity, high adult survivorship, low annual recruitment.
- Populations adjacent to major roads may be declining via reduced numbers of females
- Populations cannot compensate for the combined effects of annual road mortality (5-25%) and periodic catastrophic road mortality events (95-99%) during lake dry-downs.

A Long-term Solution:
Ecopassage consisting of concrete guide walls
and under-highway box culverts
Paynes Prairie Preserve, US 441

This drawing is intended to show general features, and is modified and simplified from site-specific designs provided by the Florida Dept. of Transportation. This drawing should not be used for another site without professional design assistance.

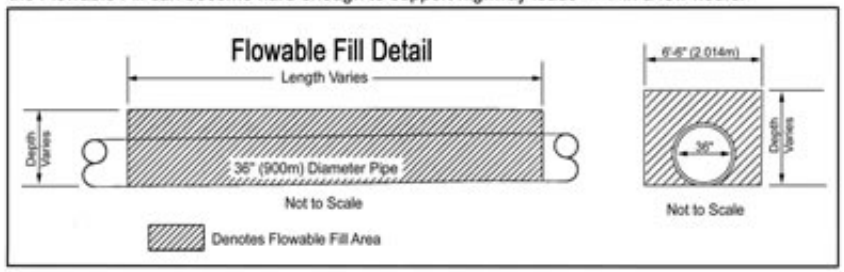


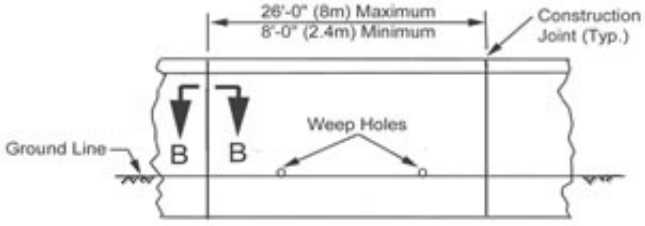
Typical Section



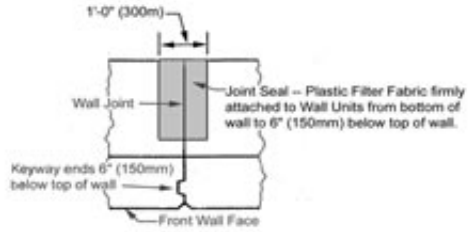
Typical Wall Section

NOTE: "Flowable Fill" describes a process of combining local silts and clays with portland cement and enough water to form a slurry which is pumped into the trench around the pipe as backfill. Under proper weather conditions the Flowable Fill can become hard enough to support highway loads within a few hours.





Front Elevation

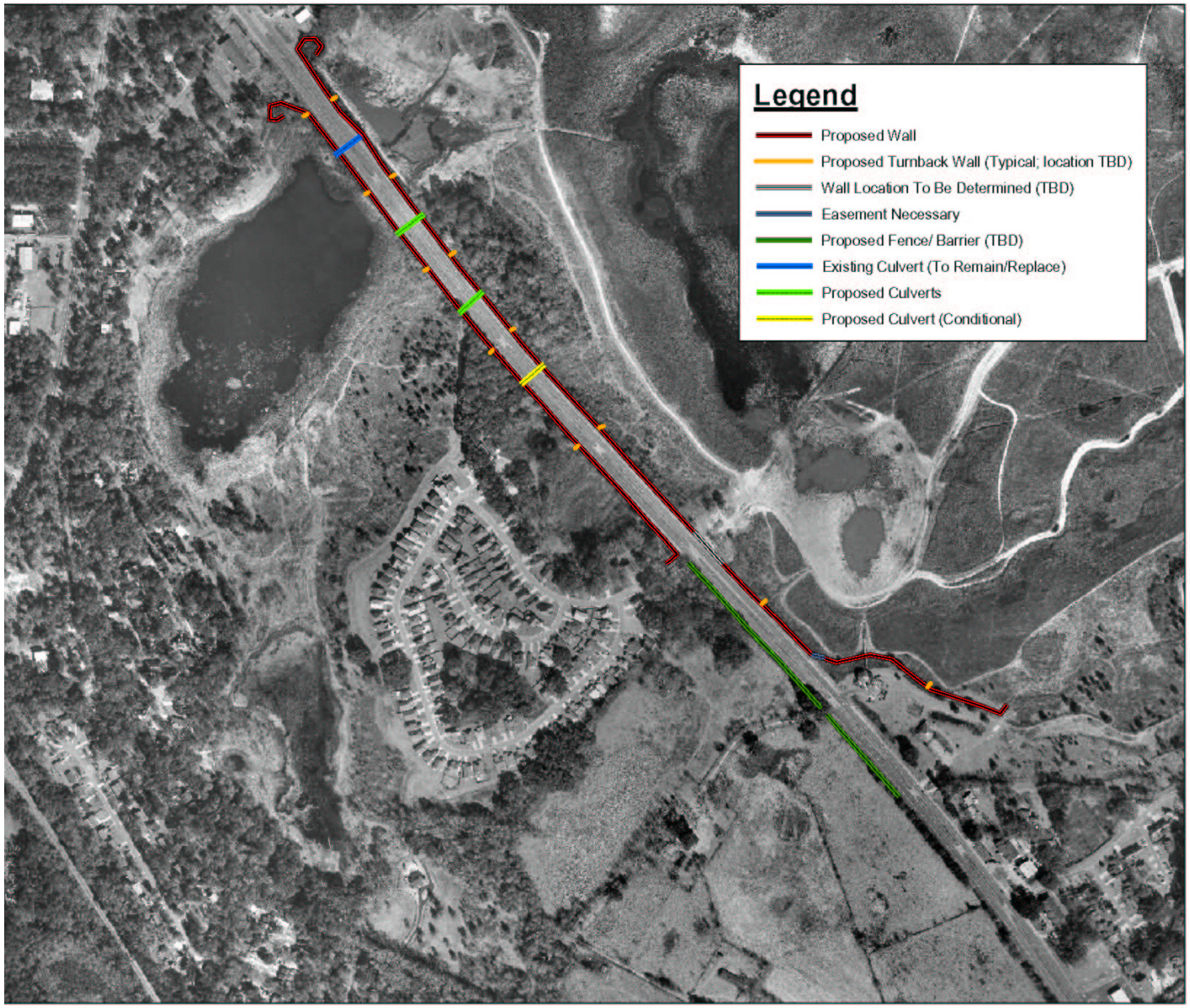


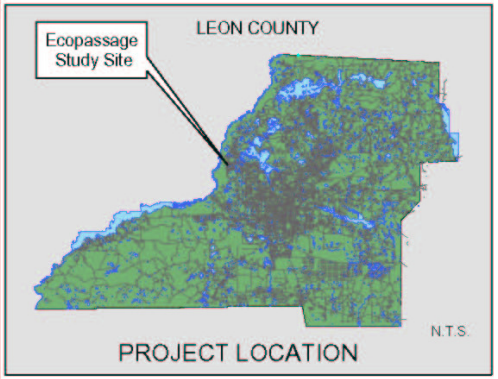
Section B-B
Construction Joint Detail

www.wildlifecrossings.info

Paynes Prairie Amphibian-Reptile Lipped Wall and Culverts

Drawn by: P. Karr	Date: 02/11/02
Approved by: S. Jacobson	
Drwg. No. 00745.01	Revised 00/00/00





0 250 500 1,000 Feet

N

NOTES:

1. This map is for informational purposes only. It is not to be considered a legal document or survey, and not to be used or presented as such.
2. Aerial from Tallahassee-Leon County, GIS (2000)
3. Minimum Wall Height proposed (from ground elevation) is 5 feet. Wall Height for turnback walls is 2.5-feet.
4. Wall to be angled and/or have an overhanging "lip" to prevent animals from climbing over wall.
5. Proposed culvert crossing size is 12' width/height, though final size will depend on existing topography. Greatest height allowable for existing topography will be used.
6. Proposed wall location TBD area dependent on moving boat ramp access to proposed Jackson View Park. Existing Boat ramp location will be closed and habitat restored.
7. Proposed culvert location (conditional) dependent on floodplain and drainag issues. Note that a culvert in this location may not be possible. If a culvert is not possible in this location, the alternative will only include 3 culverts, including replacement of the existing culvert.
8. A modified barrier wall, such as a fence, or guardrail, is proposed in the area south of Coolview Drive, in lieu of the more costly, and permanent concrete wall. A Permanent wall is recommended if construction of a stormwater pond is proposed in currently vacant property on the west side of US 27. Developer could be responsible for wall.
9. An easement may be needed to construct permanent wall from ROW to County Park property, as it will likely cross private property.
10. This Drawing is Conceptual and subject to change.

Lake Jackson ECOPASSAGE Feasibility Study

MPO

Kimley-Horn and Associates, Inc.

PROPOSED ALTERNATIVE LOCATION MAP

Migration Patterns of Turtles and other Wildlife between Lake Jackson and Little Lake Jackson, Leon County, Florida: Justification for the Construction of a Wildlife Barrier along U.S. Highway 27

12 September 2001

Report to the Florida Department of Transportation

Matthew J. Aresco
Department of Biological Science
Florida State University
Tallahassee, FL 32306-1100
aresco@bio.fsu.edu

Migration Patterns of Turtles and other Wildlife between Lake Jackson and Little Lake Jackson, Leon County, Florida: Justification for the Construction of a Wildlife Barrier along U.S. Highway 27

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= No action by FDOT

MITIGATION MEASURES TO REDUCE HIGHWAY MORTALITY OF TURTLES AND OTHER HERPETOFAUNA AT A NORTH FLORIDA LAKE

MATTHEW J. ARESCO,[1] Department of Biological Science, Florida State University, Tallahassee, FL 32306-1100, USA

Abstract: Roads built through or near wetlands cause significant mortality of reptiles and amphibians and create barriers to migration and dispersal. I investigated the number of times turtles and other herpetofauna attempted to cross a 4-lane highway at Lake Jackson, Florida, USA, during a period of severe drought (Feb–Apr 2000). Levels of road mortality were so high that I designed and installed a temporary drift fence system to work with an existing drainage culvert and for the next 2.5 years I evaluated its effectiveness at reducing road mortality and facilitating migration. I monitored roads and fences several times per day for 44 months, during both drought and non-drought conditions. A total of 10,229 reptiles and amphibians of 44 species were found either road killed or alive behind drift fences: 8,842 turtles, 838 frogs, 363 snakes, 152 lizards, 32 alligators, and 2 salamanders. Drift fences combined with intensive monitoring greatly reduced turtle road kills and facilitated the use of an under-highway culvert. Along a 0.7-km section of the highway, turtle mortality before installation of the fence (11.9/km/day) was significantly greater than post-fence mortality (0.09/km/day) and only 84 of 8,475 turtles climbed or penetrated the drift fences. Pre-fence data provided strong evidence that turtles cannot successfully cross all 4 lanes of U.S. Highway 27, as 95% of 343 turtles were killed as they first entered the highway adjacent to the shoulder and the remaining 5% were killed in the first two traffic lanes. According to a probability model, the likelihood of a turtle successfully crossing U.S. Highway 27 decreased from 32% in 1977 to only 2% in 2001 due to a 162% increase in traffic volume. Therefore, at least 98% of turtles diverted by the fences probably would have been killed if fences were not in place. The results of this study represent the highest attempted road-crossing rate ever published for turtles (1.263/km/year). Because of demographic and life history constraints, turtle populations may incur irreversible declines in areas where road mortality is high, especially when mass migrations are triggered by periods of drought.

JOURNAL OF WILDLIFE MANAGEMENT 69(2):549–560; 2005

Key words: culvert, drift fence, drought, Florida, herpetofauna, mass migration, migration barrier, road mortality, sinkhole lake, turtle.

Highways cause significant levels of wildlife mortality and can create barriers to migration, dispersal, and genetic exchange (Wilkins 1982, Reh and Seitz 1990, Rodda 1990, Vos and Chardon 1998). Differential road mortality of individuals of different sexes or life stages can affect the demography and the dynamics of populations (Moore and Mangel 1996, Mumme et al. 2000, Steen and Gibbs 2004, Aresco 2005). Such changes may alter the structure and function of communities and ecosystems adjacent to the road (Trombulak and Frissell 2000). Understanding the ecological consequences of highways and developing ways to mitigate their effects has become an important goal of many conservation biologists (Mader 1984, Rosen and Lowe 1994, Yanes et al. 1995, Forman and Alexander 1998, Trombulak and Frissell 2000, Forman et al. 2003).

Before current wetland protection laws were enacted, thousands of kilometers of roads were constructed through wetlands and caused the loss, fragmentation, and degradation of habitat via dredging, filling and alteration of hydrologic regimes (Evink 1980, Johnston 1994, Mitsch and Gosselink 2000). Reptiles and amphibians are among the fauna most negatively affected by poor transportation planning near wetlands (Ehmann and Cogger 1985, Fahrig et al. 1995, Ashley and Robinson 1996, Hels and Buchwald 2001, Smith and Dodd 2003). Highways can be significant barriers to their breeding migrations, seasonal migrations induced by drought or water level fluctuations, and normal foraging forays and dispersal (Bernadino and Dalrymple 1992, Gibbs 1998, Carr and Fahrig 2001). The "road-effect zone," the maximum distance from a road at which significant ecological effects can be detected, varies among species and individuals depending on their maximum distance and frequency of movement (Forman and Deblinger 2000, Carr and Fahrig 2001). Road-effect zones range from <200 m for sedentary species to >2.0 km for turtles, crocodilians, and some frogs (Forman and Alexander 1998, Forman 2000, Carr and Fahrig 2001) and can cause population declines and other negative demographic effects such as altered sex ratios (Kuitan 1988, Fahrig et al. 1995, Steen and Gibbs 2004, Aresco 2005).

[1] E-mail: aresco@bio.fsu.edu

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The effect of sex-specific terrestrial movements and roads on the sex ratio of freshwater turtles

Matthew J. Aresco *

Department of Biological Science, Florida State University, Tallahassee, FL 32306-1100, USA

Received 12 February 2004

Abstract

Differential road mortality may affect the demography of vertebrate populations when movements associated with foraging, reproduction, or dispersal cause a greater proportion of one sex or stage to frequently contact roads. In the case of turtles, roadsides create artificial disturbed and open habitats that may be attractive to nesting females but may cause significant road mortality. I tested this possibility by comparing the sex ratios of turtle populations in a lake that is bisected by a high-traffic, four-lane highway to those in nearby ponds located away from major roads in northwestern Florida (USA). I evaluated the potential role of road mortality as the cause of skewed sex ratios by determining whether adult female freshwater turtles move overland more frequently than that expected from actual sex ratios and the proportions of turtles of four species that attempt to nest annually along the roadside. Population sex ratios were dramatically biased toward males in the Florida cooter (*Pseudemys floridana*) (80% males), yellow-bellied slider (*Trachemys scripta*) (73% males), and common musk turtle (*Sternotherus odoratus*) (65% males) in the lake adjacent to the highway compared to those in ponds not affected by road mortality, where the proportion of males ranged from 39% to 60%. Despite male-biased population sex ratios, under normal (non-drought) conditions a significantly greater proportion of adult females (57–72%) than males were found on land along the highway and, thus, have a greater annual probability of being killed by vehicles. An estimated 6–29% of all adult females in four turtle species nested annually along the highway shoulder. If this phenomenon is general for freshwater turtle populations located near roadways, male-biased sex ratios and low numbers of adult female turtles elsewhere may be the result of cumulative differential mortality of nesting females struck by vehicles as they enter the highway during annual nesting forays.

Keywords: Road mortality; Skewed sex ratio; Turtle; Demographic effects; Differential mortality; Ecological trap

1. Introduction

Roads increase mortality rates in some species (Rosen and Lowe, 1994; Fahrig et al., 1995; Ashley and Robinson, 1996) and may create barriers to migration, dispersal, and genetic exchange (Wilkins, 1982; Mader, 1984; Reh and Seitz, 1990; Vos and Chardon, 1998). Many studies have documented high mortality of individuals (reviewed in Forman and Alexander, 1998; Trombulak and Frissell, 2000). However, few studies have documented the effects of roads on demography or population viability caused by direct mortality or indirect effects of habitat fragmentation or modification (Hels and Buchwald, 2001).

Artificial roadside habitats may attract wildlife and increase the risk of mortality from vehicle collisions. Some species prefer early successional, open habitats along roads for nesting or foraging (e.g., Florida scrub jay, *Aphelocoma coerulescens*; Mumme et al., 2000). Other species (e.g., mallards, *Anas platyrhynchos*, Cowardin et al., 1985; leopard frogs, *Rana sphenocephala*, Smith and Dodd, 2003) prefer nesting or breeding in man-made stormwater retention ponds or dredge

* Tel.: +1 850 562 3693.
E-mail address: aresco@bio.fsu.edu.

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www.lakejacksonturtles.org

Over 70,000 hits since September 2002
Site visits from over 60 countries

Established a nonprofit citizen's action group in December 2002: Lake Jackson Ecopassage Alliance, Inc

- Currently almost 500 members both locally nationally, and internationally
- > 500 letters and emails sent to FDOT, Leon County, state and Federal legislators

I Support the

LAKE JACKSON ECOPASSAGE

www.lakejacksonturtles.org

LAKE JACKSON ECOPASSAGE ALLIANCE

Local and National Media Attention

The Boston Globe

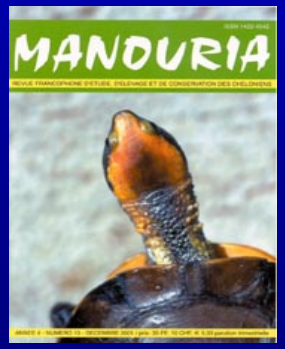
St. Petersburg Times

THE TAMPA TRIBUNE

TALLAHASSEE DEMOCRAT
Keeping you in touch

FloridaState Times ONLINE

DEFENDERS OF WILDLIFE



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NEWS CAPITOL NEWS SERVICE TALLAHASSEE, FL.

NATIONAL WILDLIFE FEDERATION®

March 3, 2000

TALLAHASSEE DEMOCRAT
Keeping you in touch

Lake Jackson's troubled wildlife

A turtle takes a breather after a remarkable journey — in the hands of Matthew Aresco. The FSU student saved this one, as he has many others, from a perilous migration across U.S. 27 North, which separates Lake Jackson from the more watery Little Lake Jackson, this turtle's new home.

MIKE EWEN / Democrat

FSU grad student snaps to the defense of turtles

Facing drought and hostile fisherman, they need help.

By David Twiddy
DEMOCRAT STAFF WRITER

It's tough being a turtle these days in Lake Jackson.

The lake's drying-out has forced scores of the slow-footed reptiles into the usually destructive path of traffic. Those that stay behind aren't doing much better, running afoul of machete-armed anglers who sometimes hack them up to protect their bait worms or to retrieve their favorite hooks.

But if turtles have guardian angels, the ones in Lake Jackson have Matthew Aresco.

The Florida State University graduate student, who has studied turtles for seven years, has taken up their cause — he's put up signs, asked county officials to help divert turtles away from the deathtrap of busy U.S. 27 North, where he has found close to 80 carcasses since January, and persuaded state wildlife officers to start cruising the banks to stop turtle butchery.

Aresco acknowledges this is not a sexy issue, and most of the turtles dying are not on anyone's endangered species list. But he's says it's still the right thing to do.

"They're very beneficial to the lake's ecology," he said, noting the amount of hydrilla and other nuisance plants the turtles eat. "They're like cows in the lake. Fishermen should like these turtles."

Make no mistake, Aresco loves turtles.

Always fascinated by them, his backyard is dotted with sunken kiddie pools filled with the clambering reptiles, many of which he warmly calls pets. He added that it helps to have a research subject much slower than yourself.

But his backyard holds some terrapin nightmares as well.

He has filled a kitchen garbage can with the flattened remnants of turtles he's found along a quarter-mile strip of U.S. 27 North, killed as they tried to move to Little Lake Jackson, where there still is water.

A dangerous migration

Walking along the road, you can easily find shell fragments. In fact, on a random tour, Aresco and two journalists found a cooter and a mud turtle, both females, about to begin the trek. Aresco carried them to safety on the other side.

A metal culvert runs under U.S. 27, but turtles typically cross from lake to lake in a straight line.

Mike Willett, Leon County's public works director, and David Zeigler, an official with the state Department of Transportation's environmental management office, said this week that they are considering building a low fence along the bushes on the shoulder of the road. The turtles would bump into the fence and be funneled to the culvert, where they could cross safely. State officials have done similar projects around

Please see TURTLES, 5A

Cooters and sliders

Two kinds of Lake Jackson turtles most often killed on roads and by fishermen:

The Florida Cooter has a dark shell with faint yellow markings. It also has yellow markings on its head and feet. It grows to 13 inches in length.

The Yellowbelly Slider has a dark shell with lighter wide bars. It has a yellow patch behind each eye and two black spots on a bright yellow belly. It grows to 11 inches in length.

JOHN ROBERGE/Democrat

FROM PAGE 3

TURTLES:

'Fishermen should like these turtles'

From 3A

the state for bears and other wildlife.

"Part of my job and the commitment of the department is making sure things like (turtles) don't get killed," Zeigler said.

In another bin in Aresco's backyard he keeps the bodies of turtles he found at the southernmost tip of the lake's Meginnis Arm. But these didn't die accidentally. They have cut throats, snapped necks, faces removed with knives or wire cutters — if they have heads at all.

Unsettling stories for simple nature lovers. Devastating for a turtle researcher.

"It's a shame that people will kill a turtle that's 20 or 30 years old to save a hook that's 2 cents," said Aresco, himself a fisherman, as he studied a headless Florida cooter he found floating on Thursday.

"This gets me so upset when I see that."

Fishermen are a problem

The main culprit, of course, is the drought. Already this year, Tallahassee is six inches below normal rainfall. As the water retreats, the turtles become more concentrated in the remaining pockets of water — as do the fish sought by anglers. While turtles typically eat plants and carrion, they'll gladly take bait worms, which puts them in conflict with the anglers.

"The most horrific I've seen was (last week) where I found this turtle crawling — it literally had no front of its head," Aresco said.

While fishing for turtles for food is legal, wounding them and leaving them to die is not. Officials with the Florida Fish and Wildlife Conservation Commission call it "wanton destruction of wildlife" and say it is a second-degree misdemeanor, punishable with up to $500 in fines and six months in jail.

Aresco said he's talked to individual fishermen about the problem, even offering to show them how to easily remove fish hooks. Most often, he said they reply that turtles are pests. Or they deny seeing anyone do it.

Recovery may take time

But the bodies keep coming — close to 30 in the last two months in this cove alone. He installed a series of yellow signs recently, warning that it was a research area and killing turtles is illegal. One morning, he found an old cooter with a broken neck at the foot of one of his signs.

Most of the turtles dying in the lake and on the road are nonendangered cooters and yellowbelly sliders. But Aresco worries about the sheer number of turtles dying. It takes eight to 10 years for a turtle to mature enough to reproduce, meaning a loss of adults equates to fewer turtles in the future.

While Aresco's attempts to educate anglers have been largely unsuccessful, he said he hopes the roadkill on U.S. 27 will decrease once the fence is up. Then he can stop his weekly collections of the dead — on the asphalt, anyway.

"You're not trying to change people's behavior," Aresco said of the fence. "You're changing the turtles' behavior, which is a lot easier to do."

MIKE EWEN / Democrat

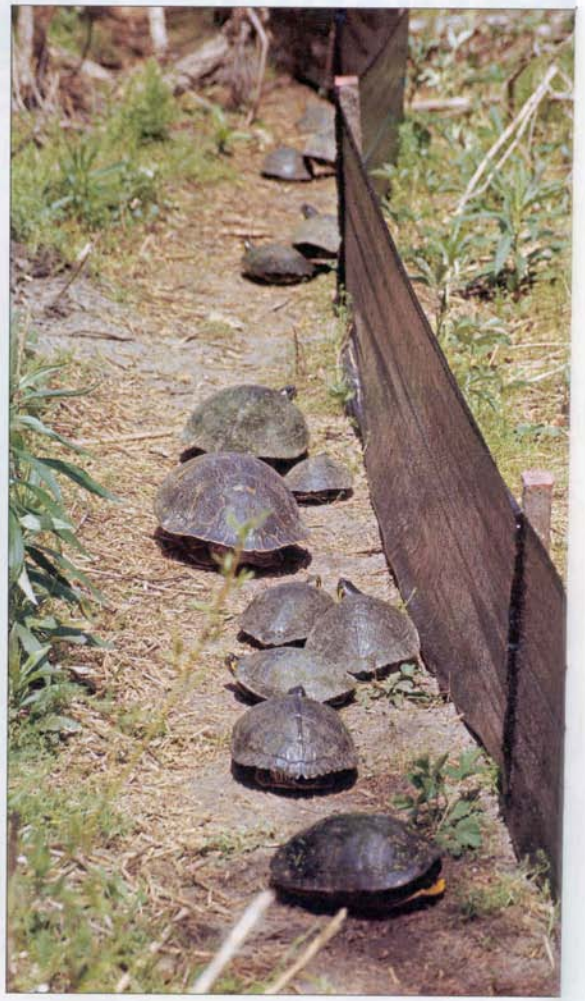
Aresco checks out a Lake Jackson resident; he erected the sign to try to cut down on the killing of the turtles.

Florida Wildlife
March-April 2002

Surviving Drought
LAKE JACKSON'S TURTLES

Text and Photographs by
Matthew J. Aresco

As the spring of 2000 approached, dozens of dead turtles began to accumulate daily along U.S. 27 N as they left the drying lake and tried to cross the highway towards Little Lake Jackson.



The roar of an 18-wheeler is followed by a blast of air as it passes. Hidden in the low brush at the edge of U.S. 27 near Tallahassee is a Florida cooter, a turtle that hatched from an egg on the shores of Lake Jackson 15 years ago. She grew large living in the lake, but today she must leave. The lake waters had been slowly receding for months and this morning she crawled out of a muddy drying pool to begin a dangerous migration to find new water. Ancient instincts directed her west, somehow knowing that there was water in the distance.

She forced her large armored body through the thick vegetation and by afternoon she had slowly climbed the steep slope that leads to the highway, sliding back down several times before reaching the top. After pausing to rest, she leaves the cover of the roadside brush and stretches her neck to use all her senses to guide her. Water and a new home are only a few hundred yards away, but the landscape between her and her goal is strangely unfamiliar. She could not know that the short stretch of open ground ahead is a killing zone for turtles; she only knows that she must cross to the other side.

Driving north on U.S. 27, I squint my eyes and see the familiar silhouette from a quarter mile away. I quickly pull my truck off the road, get out, and race towards her. I would have only a few seconds to save her. A line of rush hour traffic is rapidly approaching and the turtle, paused in the center of the northbound lane, is confused and trying to get a bearing on her position. Seeing me running towards her, she pulls her head into the safety of her shell, not aware that the real danger is the rolling thunder of the machines piloted by motorists oblivious to her plight. I snatch

The Boston Globe

Student seeks safe path for migrating turtles

By Debra Weyermann
GLOBE CORRESPONDENT

TALLAHASSEE — In a few weeks, Matthew Aresco begins his fourth year of darting into traffic on US Highway 27 in an effort to rescue turtles heading for the wetlands.

The 39-year-old doctoral student came to Florida State University from Connecticut to study the ecological role of turtles living in Florida wetland lakes. Driving on Route 27 near Lake Jackson, he found that the turtles were being crushed by the hundreds along a mile-long stretch of the highway as they tried to make their way to higher water on the other side of the road.

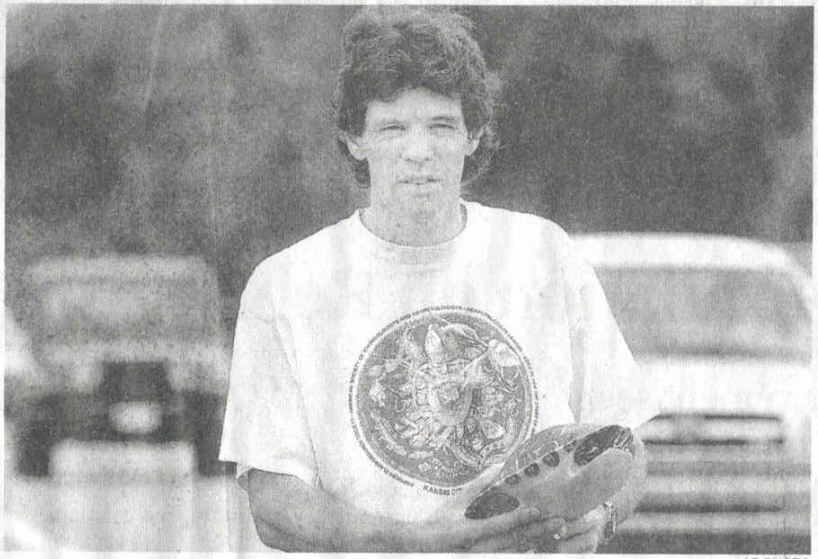
"On a bad day, it's a mess of goo and bones," Aresco said. "All along the highway here are thousands of turtle bones in the grass, like some horrible turtle mass grave site."

Aresco began spending up to nine hours a day trying to rescue the turtles as they attempted to cross the busy four-lane highway.

He threads through traffic carrying the turtles, some weighing up to 30 pounds, to safety. Though he's saved more than 8,000 turtles so far, he says, it is not enough.

The Florida Department of Transportation has given him permission, and some materials, to build a temporary nylon fence to help guide the turtles to a culvert so they can safely cross the highway.

But Aresco wants the department to build up to four more culverts along this portion of the highway and a wall to direct the animals to the new underground passageways.



AP PHOTO

'All along the highway here are thousands of turtle bones in the grass, like some horrible turtle mass grave site.'

MATTHEW ARESCO, *doctoral student at Florida State University*

Turtles are killed in Tallahassee more often than any other place in the United States, Aresco said.

"The ratio of male to female turtles here is about four to one and that's not good," Aresco said. "Some turtles take 15 to 20 years to reach reproductive age. If adult females are being killed at this rate, it will impact populations, perhaps to the point they cannot recover."

Other animals are killed along this same stretch of highway, Aresco said. The path to the culvert is filled with all sorts of animal tracks, including those made by alligators and racoons.

"They will use the culverts," Aresco said.

Leon County Commissioner Dan Winchester, who grew up on Lake Jackson and still lives there, said he is dedicated to Aresco's cause.

"Aside from the fact that Lake Jackson generates $20 million a year for this county, there are the public safety issues," Winchester said. "We have a plan to turn the whole lake into a passive, eco-tourism type park, so everyone can enjoy its beauty and wildlife. We need the turtles there."

The highway department sympathizes, but money is tight, said Ed Prescott, Florida's Department of Transportation secretary for District 3.

The culverts Aresco wants could cost up to $3 million. The department receives some money each year for ecological improvements, but requests for funds to help the Lake Jackson turtles compete with other requests for species such as the Florida panther and the black bear.

"We've authorized $100,000 to conduct a proper study" for the culverts, Prescott said. "We'll have to see what happens after that."

Aresco bristled at this plan. "Data is data," he said. "I've got a foot-thick sheaf of it. They should go directly to design now."

Lake Jackson is shallow and typical of many Florida wetland areas, teeming with vegetation and wildlife. Built before current environmental laws were enacted, US 27 bisects the 4,000-acre lake.

The highway would never have been approved for construction today.

BBC Wildlife
February 2003

NEWS of the Earth

A road paved with turtles

US How one man's concern has saved more than 8,000 animals and put the Florida authorities to shame.

More turtles are killed on US Highway 27 in North Florida than on any other road in the world. Were it not for the efforts of one biologist, turtles and other wildlife would continue to die along this section of busy highway separating Lake Jackson and Little Lake Jackson, just north of Tallahassee.

Three years ago, Matthew Aresco constructed a 1,500m cloth drift fence to direct migrating turtles along the side of the road and through a culvert to the other side. Through daily visits, he has saved more than 8,000 turtles representing 10 species. The animals that don't find the culvert are carried by hand across the highway.

Water levels in the 1,600ha lake are dependent on rainfall and so fluctuate widely, prompting turtles to migrate continually between the lakes, seeking moisture. In some years, Lake Jackson drains completely through two sinkholes, and thousands of turtles must attempt to cross the highway. But the migration route between the lakes is bisected by a 4-lane highway travelled by 21,500 vehicles a day. Aresco estimates that, prior to the construction of his fence, only 1 per cent of turtles would have made it across. Though his fence has been remarkably effective, it is only a temporary solution. Being only 45cm high, many species can climb over it and onto the highway. The fence also requires constant maintenance, and in January alone, it was vandalised at five locations.

Aresco and a group of concerned citizens are lobbying state and federal officials to construct an 'ecopassage' along 1.2km of Highway 27. This would direct migrating wildlife along a 1.25m-high concrete guide wall and under the road through three to four new underpasses. The ecopassage concept has virtually eliminated road kill in other parts of Florida, but so far, agencies have made no commitment to such a project at Lake Jackson. The cost would be a small price to pay for a state that creates glossy brochures promising tourists a Florida rich in natural beauty and teeming with wildlife. Meanwhile, Aresco and the turtles wait anxiously for a solution to this unprecedented problem.

JAKOB DULISSE

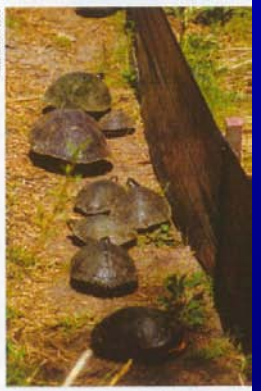
Highway statistics

- Highway 27 is the world's worst turtle-killing road. Without Aresco's intervention, turtles would be killed at a rate of 1,680 a kilometre per year.
- Turtles are slow to reproduce, reaching sexual maturity at a seasoned age of 10-15 years. Adult mortality in natural populations is very low, and so the addition of road kills will have a great impact on numbers.
- More than 9,200 individuals belonging to 74 species have been recorded along the fence or dead on the road, including amphibians, reptiles, mammals and birds.
- Human lives are also at risk. Aresco has witnessed two accidents involving wildlife. In one case, a car collided with a 2m alligator.

Action

Lake Jackson Ecopassage Alliance, PO Box 180891, Tallahassee, Florida 32318 USA.
http://www.lakejacksonturtles.org

Matthew Aresco



Safe routing. Turtles saved from the road by a fence guiding them to water.

The Lake Jackson Ecopassage

Providing a Safe Path for Wildlife


Florida Cooter


Pig Frog

Lake Jackson Ecopassage Alliance
P. O. Box 180891
Tallahassee, FL 32318

Phone: (850) 562-3093
turtles@lakejacksonturtles.org
www.lakejacksonturtles.org

Lake Jackson Ecosystem

Lake Jackson is a large shallow lake north of Tallahassee in Leon County, Florida. Lake Jackson experiences annual fluctuations in water level and partial or almost complete drydowns during periods of drought.


Musk Turtle

Lake Jackson is designated as a State Aquatic Preserve and an Outstanding Water Body, and is considered one of Leon County's most precious natural resources. Lake Jackson supports populations of many species of fish, aquatic birds, mammals, reptiles and amphibians.

The Problem: Road Mortality

A wildlife mortality crisis is occurring at Lake Jackson on U. S. Highway 27, a road that bisects the lake. This road is a busy 4-lane divided highway with over 21,500 vehicles per day.

Normal annual fluctuations in water levels and periodic drydowns cause wildlife to attempt to migrate across this highway. To prevent turtles and other wildlife from being killed on this road, temporary nylon silt-fences were constructed to divert animals through a culvert under the road.


Turtles being redirected by temporary fence

In 33 months, over 8,600 turtles have been found attempting to cross the road at this site, the highest rate ever documented for any road mortality site in the world.

These fences were monitored from 2000-2003 and 43 species of reptiles and amphibians and 15 species of mammals were documented attempting to cross or were found dead on the road.

Turtles and other wildlife play an important role in lake ecosystems by eating invasive species of plants like *Hydrilla* and scavenging on dead material. These animals maintain proper ecosystem functioning in Lake Jackson.

Wildlife on the highway is also a threat to motorist safety: large alligators, softshell and snapping turtles (up to 30 lbs.) frequently attempt to cross this road.


This 7-foot alligator was killed crossing US Highway 27

The Solution: An Ecopassage

To allow wildlife to continue their natural migration across this highway, a series of culverts and guidewalls can be constructed to allow these animals to pass unharmed under the road. The ecopassage below was recently constructed by the Florida Department of Transportation at Payne's Prairie on U. S. 441 near Gainesville.


THE LAKE JACKSON ECOPASSAGE
PROVIDING A SAFE PATH FOR WILDLIFE


THE LAKE JACKSON ECOPASSAGE
PROVIDING A SAFE PATH FOR WILDLIFE

Organizations and Agencies Officially Endorsing the Lake Jackson Ecopassage

Alachua Audubon Society
American Society of Ichthyologists and Herpetologists
American Society for the Prevention of Cruelty to Animals
American Tortoise Rescue
Annie's Homegrown Organic Pasta
Apalachee Ecological Conservancy, Inc
Auburn Herpetological Society
Betton Hills Neighborhood Association
California Turtle and Tortoise Club
Canadian Amphibian and Reptile Conservation Network
The Canoe Shop
Center for North American Herpetology
Coastal Plains Institute
Conservation Services Southeast
Dallas-Fort Worth Herpetological Society
Defenders of Wildlife
Environmental Services Program, FSU
Florida Department of Environmental Protection
Florida Fish and Wildlife Conservation Commission
Florida Lake Management Society
Florida Natural Areas Inventory
Florida Public Interest Research Group
Florida Wildlife Federation
Friends of Lake Jackson
Gainesville Herpetological Society
Gopher Tortoise Council
Gulf Specimen Marine Lab
Heart of the Earth
Herpetologists' League
Humane Society of the United States
Jacksonville Herpetological Society
Lake Jackson Ecopassage Alliance, Inc.
Leon County
Mid Atlantic Turtle and Tortoise Society
Minnesota Herpetological Society
National Audubon Society
National Wildlife Federation
Native Nurseries
New York Turtle and Tortoise Society
Northwest Florida Water Management District
Partners in Amphibian and Reptile Conservation (PARC)
Paynes Prairie Wildlife Coalition
Saint Francis Wildlife Association
Saint Louis / Midwest Turtle & Tortoise Society
Savannah River Ecology Laboratory
Sierra Club
Tortoise Trust
Turtle and Tortoise Club of Florida
United States Geological Survey
World Chelonian Trust

Work directly with local government decision-makers, politicians, and staff

County Commission

The Leon County Commission took the following action at its Tuesday meeting:

- **Turtle passages OK'd:** Unanimously approved measures to help find state and federal funding for underground "ecopassages" for turtles crossing U.S. Highway 27 at Lake Jackson. Matt Aresco, a Florida State University doctoral student, asked commissioners to fund the series of underground culverts for turtles and other wildlife. Without the culverts, he said more turtles would die on the road than anywhere else in North America. A number of people came to the meeting to support Aresco.
- **Fee hike OK'd:** Voted 5-0 to approve increases in building permit fees. The fees, which go into effect next month, will raise an estimated $545,000 for county growth management. With the increases, it was estimated that the cost to permit a single-family home will go up $114.
- **Center gets name:** Unanimously approved naming the new Chaires-Capitola Community Center after Dorothy C. Spence.

Leon County Commission

The Leon County Commission took the following action during its Tuesday meeting:

- **Lake Jackson crossing:** Approved a $100,000 state study on wildlife passages at U.S. Highway 27 and Lake Jackson. The study, funded through the state Department of Transportation, will evaluate ways to help wildlife cross the roadway between Lake Jackson and Little Lake Jackson. In September, Matt Aresco, a biological science doctoral student at Florida State University, asked commissioners for help in protecting turtles that cross the road. He said hundreds are struck by cars and killed each year. The study will give recommendations on whether to proceed with underground tunnels to shuttle wildlife across the road, walls to keep them off the road or a combination of both.
- **Jackson View Park:** Approved submission of an application for a $200,000 state grant for development of the new Jackson View Park. The 44-acre park is located off U.S. Highway 27 along the shores of Lake Jackson. Planned improvements include trails, boardwalks, fishing and wildlife observation piers, picnic facilities, interpretive programs, ecosystem rehabilitation and parking. The county is applying through the Department of Environmental Protection's land and water conservation fund.

■ For more information, go to the county's Web site at www.co.leon.fl.us.

Summer 2003

District 3 Annual Update

from Dan Winchester, District 3 Commissioner

Serving the people of District 3 • 487-1157

Widening I-10 Does Not Have to Threaten Lake Jackson

While I agree that I-10 needs to be improved, my discussions with citizen groups, environmental agencies, and the Department of Transportation (FDOT) have shown me that we can improve I-10 without hurting Lake Jackson. We have invested millions of dollars in the Lake Jackson cleanup, and we don't want to make the mistakes of the past. We should keep a sensitive eye on protecting the tax dollars spent on this environmental and recreational jewel.

I am working with the Friends of Lake Jackson to ensure that there is no new impact on Lake Jackson. Nancy McGrath, President of the Friends of Lake Jackson, is serving on the FDOT Project Advisory Group and is also forming a Citizens Advisory Group. McGrath says, "Working with FDOT this early in their design process is an unusual opportunity to have input regarding the needs of our unique aquatic preserve. Our goal is to make sure this particular 2.5 mile stretch of the I-10 expansion, which crosses directly through the Lake Jackson Basin, is constructed in the most environmentally sensitive manner possible."

Dear Neighbor,

We have many important projects taking place in our county and especially within District 3. I am very proud of the cleanup of Lake Jackson, the progress on new parks and ball fields, and the many road and stormwater improvements as outlined in Blueprint 2000. Yet from providing emergency medical services, to improving stormwater flooding, to building new parks and libraries, we have our work cut out for us.

But I still need to hear about what is important to you.

What things can we be doing to improve Leon County? How do you feel the County Commission is doing? What are the priorities that you would like to see addressed?

I want the opportunity to sit down and talk with you, one-on-one, to hear your thoughts and ideas. That is why I am going to start scheduling regular "Let's Talk" sessions. At these informal get-togethers, you can come to me and voice your concerns. Your participation in County Commission meetings remains important, but I want to be able to talk with you in an environment where we can focus on District 3. Our first "Let's Talk" session will take place at the Lake Jackson Library branch on Tuesday, September 9th from 5:30 - 7:30pm. I hope to see you there.

In the meantime, or if you can't attend the session, please contact me with your feedback at 487-1157 (office) or at 562-2001 (home). As I may get several hundred calls, I hope you will understand if it takes me a few days to get back to you.

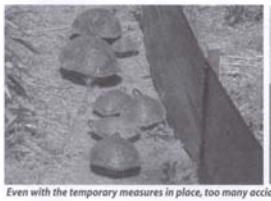
Thank you for your interest. It is an honor to serve the people of District 3.

Sincerely,

Dan

I want to hear from you! You can call me at my County Commission office at **487-1157** or at home at **562-2001**, or you can e-mail me at **danw@mail.co.leon.fl.us**

Our first "**Let's Talk**" Session will take place on Tuesday, September 9th at the Lake Jackson Library branch (in the Food Lion shopping center) from 5:30-7:30 pm.



Even with the temporary measures in place, too many accidents are being caused by wildlife crossings.

Lake Jackson Ecopassage: Where Road Safety Meets Environmental Protection

As Lake Jackson's health has been restored, we are seeing more wildlife than ever. Unfortunately, as the water recedes due to natural causes, wildlife attempts to migrate back and forth across US Highway 27 between Lake Jackson and Little Lake Jackson. The 21,500 motorists who drive by this area each day threaten the migrating wildlife, and when the wildlife is threatened, the health of Lake Jackson is threatened as well. Most important of all, migrating wildlife threatens motorist safety.

While thankfully no one has been hurt in the accidents that have already taken place, I am working aggressively to build a permanent Lake Jackson Ecopassage to help protect motorist safety. The Lake Jackson Ecopassage — at no additional cost to Leon County taxpayers — will consist of a permanent series of culverts and guidewalls designed to allow wildlife to pass safely under the road. With the Lake Jackson Ecopassage we protect wildlife, we protect the tax dollars invested in Lake Jackson's restoration, and we protect the safety of those who drive by this area every day.

For more information, contact Matthew Aresco with the Lake Jackson Ecopassage Alliance at 562-3093.

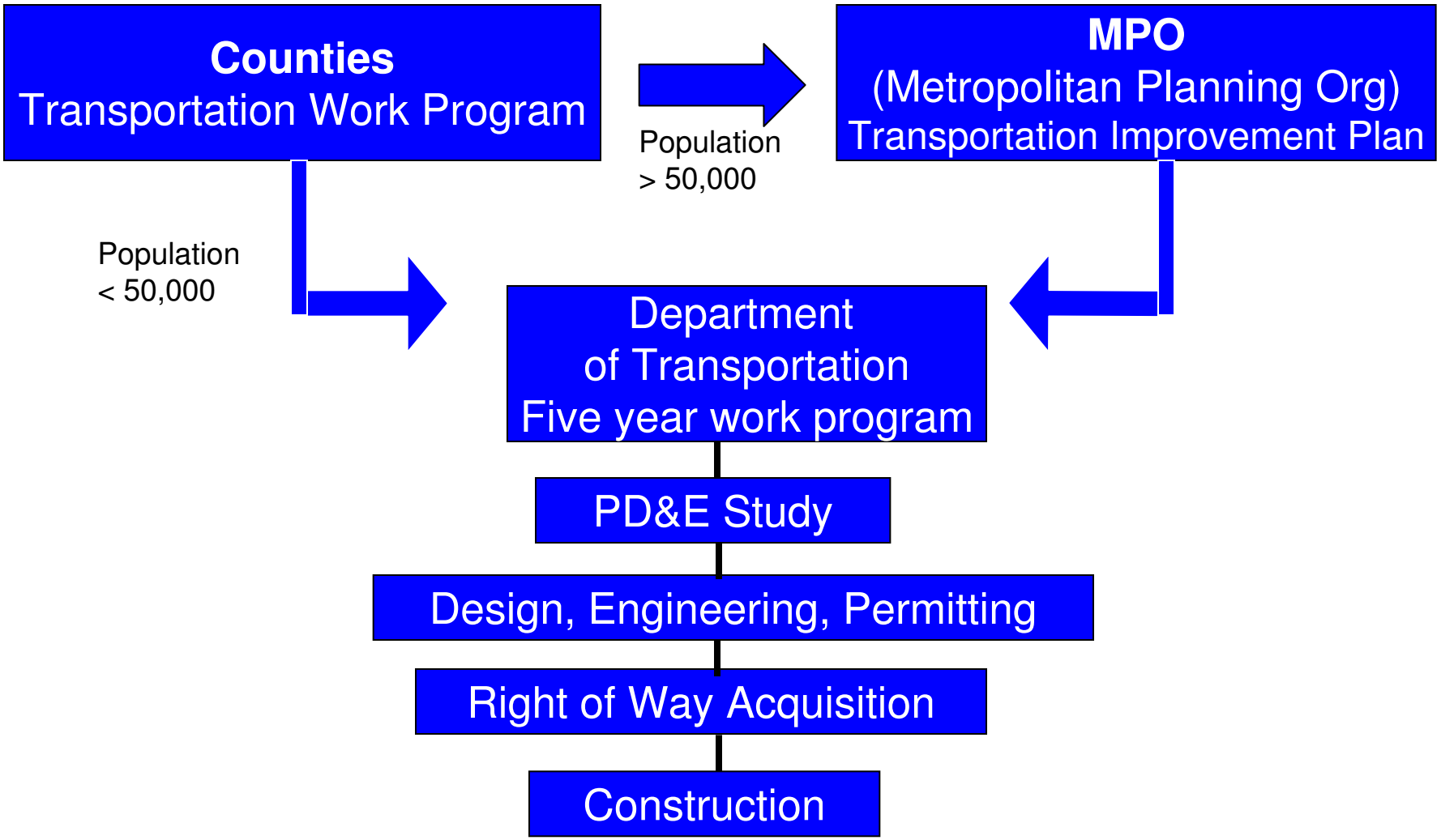
At no cost to you , the Lake Jackson Ecopassage will be a secure passage for wildlife and will protect motorist safety.

Leon County Courthouse
301 S. Monroe Street, 5th floor
Tallahassee, FL 32301

Progress to a permanent ecopassage

- Sept. 2002 - Leon County Commissioners direct transportation planning staff to seek the funding for an ecopassage on U.S. 27
- Oct. 2002 - FDOT Environmental Management Office allocates $125,000 for a feasibility study (to be managed by the County)
- Nov. 2002 – Leon County establishes the Lake Jackson Ecopassage Scientific Advisory Group
- Aug. 2003 - Leon County hires Kimley-Horn to conduct a design feasibility study
- November 2004 – MPO approves preferred design alternative (wall and 4 culvert system)
- December 2004 – Feasibility Study completed
- May 2005 – MPO approves start of $60,000 Project Development and Environment study (PD&E)
- January 2007 – Kimley-Horn completes PD&E
- January 2007 FDOT allocates $436,00 for design contract

State Transportation Project Development



Funding Sources for Wildlife Crossings

- Federal Transportation Enhancement Funds under SAFETEA
- State DOT Ecosystem Management Funds or Discretionary Environmental Mitigation funds
- Public/Private Partnerships

www.savetheredbelly.org