

Biology and Conservation of the Diamondback Terrapin, *Malaclemys terrapin pileata*, in Alabama

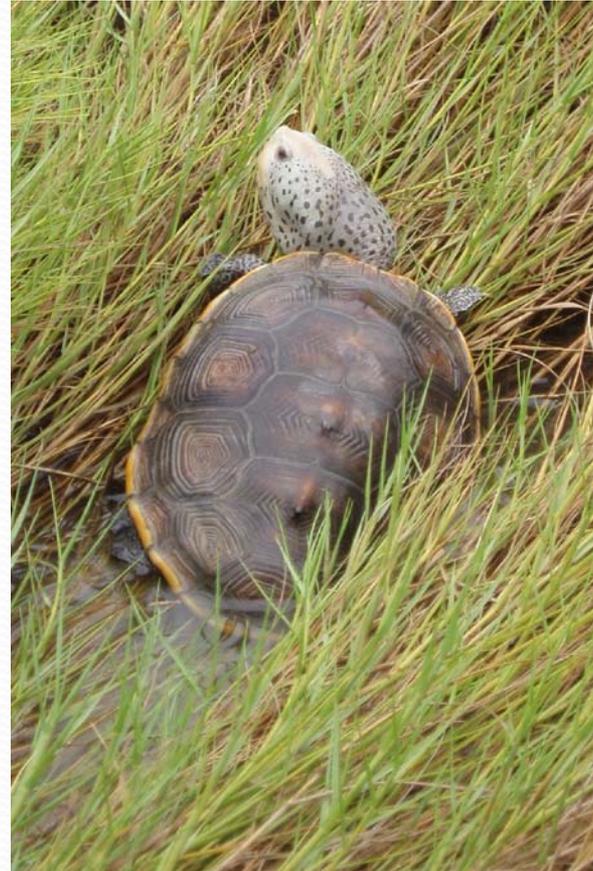
Andrew T. Coleman

NOAA Knauss Brown Bag Seminar

June 16, 2011

Background on diamondback terrapins

- Biologically unique
- Only turtle in North America that exclusively inhabits brackish water environments



Background



- Range extends from Cape Cod, MA along the Atlantic and Gulf coasts to Corpus Christi, TX
- 7 subspecies currently recognized
- *Malaclemys terrapin pileata*

Background

- Major predators on
 - salt marsh periwinkle snails (*Littorina irrorata*),
 - blue crabs (*Callinectes sapidus*), and
 - other invertebrates as well as some fishes
- Potentially a keystone predator
 - Contributes to maintaining salt marsh integrity
 - Silliman and Zieman, 2001;
 - Silliman *et al.*, 2005;
 - Gustafson *et al.*, 2006;
 - Tucker *et al.*, 1995



Threats

- Crab trap mortality
- Habitat loss
- Nest predation
- Road mortality



Gross et al., 2009
Chelonian Conservation
and Biology 8: 98-100

94 drowned terrapin in a
single derelict trap in
a Georgia salt marsh.



Historically a Valuable Marine Resource

Diamondback Terrapin Stew, Chesapeake Bay Style Recipe #283841

Turtle soup or stew is no longer a popular item on today's menus, but it once graced the tables of the rich and powerful. From the Southern chapter of the United States Regional Cookbook, Culinary Arts Institute of Chicago, 1947. Cooking time is approximate.

by Molly53

2½ hours | 20 min prep

SERVES 6 -8

3 large terrapins (turtles)
6 eggs, hard-cooked
3 tablespoons flour
1/2 teaspoon ground nutmeg
3 tablespoons lemon juice (fresh is best)
1 tablespoon lemon rind, grated
1 onion, peeled and sliced
2 stalks celery, diced
1 tablespoon worcestershire sauce
1/2 cup cream
2 cups sherry wine
salt and pepper, to taste
3 cups chicken stock or vegetable stock
hot milk, if necessary

Terrapin have been utilized for several centuries for making terrapin stew

1. Drop live terrapin into boiling water and let stand for 5 minutes.
2. Remove from water; rub skin off feet, tail and head with a towel, drawing the head out with a skewer.
3. Clip off claws.
4. Scrub shell with boiling water; break apart with a cleaver or axe.
5. Remove meat and liver.
6. Discard heart, sandbag, entrails and gall bladder (taking caution not to break it as it's bitter).
7. Cut the liver in thin slices.
8. Take out eggs, remove film and set aside in cold water.
9. Mash yolks of eggs; add flour, nutmeg, lemon juice and rind.
10. Stir in 1 cup of soup stock.
11. Add onion, celery, terrapin and terrapin eggs and enough more stock to cover meat.
12. Cook in double boiler until meat falls from bones.
13. Remove bones, add worcestershire sauce, salt, pepper, chopped egg whites, cream, sherry and milk (if necessary).
14. Heat thoroughly and serve with toast.

A TALK ABOUT TERRAPINS.

**HOW WASHINGTON'S FAVORITE DELICACY IS
OBTAINED AND STEWED.**

From the Washington Post.

“Stewed terrapin, Maryland style,” forms an important part of any Washington dinner laying claim to being a pretentious affair. A veteran caterer declares that the very finest terrapin on the American continent are caught in the Potomac River, just before it empties into the Chesapeake Bay, and at its mouth. They are more tender, he

Washington Post, December 5, 1880

By the late 1800's, terrapin stew was one of the top delicacies in the U.S.

Maryland Terrapin Farm

TERRAPIN CULTURE.

A Maryland Expert Talks Entertainingly About It—A Profitable Industry.

From The Baltimore Sun.

Mr. James C. Tawes, the State Fish Commissioner for the Eastern Shore, lives in Crisfield. He is an active and progressive business man, and unusually bright and intelligent. He has spent his life as a dealer in marine productions, such as fish, crabs, oysters, and terrapin, and is alert to note anything affecting that industry. He has many testimonials from people all over the State engaged in its fisheries to the great increase in the supply of shad and other fish through the efforts of the Fish Commission. Mr. Tawes purposes to devote the efforts of the commission particularly to mountain trout and black bass, not relaxing, however, the previous efforts that he and others have made to increase the supply of perch in Maryland waters.

Diamond Backs.

A Terrapin Pound.

Mr. Lavalette has a handsome dwelling on the south side of Crisfield harbor and near it, across an arm of a small creek, is his terrapin pound. It is securely fenced in, so as to prevent the escape of the high-priced inmates. He has at present about 10,000 terrapin, most of which are now in the water, and will be ready to

The New York Times

Published: December 26, 1897

Copyright © The New York Times

naps, too, for the rest of the year.

Mr. Tawes is of opinion that he could make a very decided impression upon the terrapin supply in a short while. He would do this not because the terrapin is a luxury, but because it used to be and can again become a source of great profit to those who catch them upon our great marshes on the Chesapeake Bay and its tributaries. At present prices a seven-inch diamond-back is worth in the city markets from \$8 to \$10.

While the people of this region are noted for their honesty and square dealing, Lavalette takes no chances. He has a one room house in the centre of his terrapin farm, built twenty feet above the marsh on piles, and in this house are Winchester rifles. One of his trusted employees sleeps in the house every night, and it would be unwise for any one to attempt to make a raid on the farm. Large rats give him more trouble than thieves, as they occasionally get into the pen and kill and eat the young. Rats will also dig and eat the eggs, and, as a terrapin deposits her eggs only once a year, the breaking up of a "hatching" means a heavy loss. A. T. Lavalette says it is a great error to state that terrapin eggs are hatched by the sun's heat. The



Barbee's Pavilion and Diamond Back **Terrapin Farm** was founded by Alexander **Barbee** as an experiment in 1893. The **farm** was a covered building, 150 feet by 60 feet, divided into 18 pens. The turtles were separated by age and size. An advertisement for the business claims **Barbee** was the first person to successfully hatch a **terrapin**. He converted a suitcase into a portable incubator with which he traveled in order to demonstrate his discoveries and promote his business. A trained **terrapin**, Toby, often traveled with him. **Barbee** died in 1929.

Barbee Terrapin Farm: Founded in 1893, Isle of Hope, GA

U.S. Bureau of Fisheries (now NMFS) Beaufort Laboratory, North Carolina

- Terrapin aquaculture was one of the main projects conducted by this lab from 1909 – 1940



- Raised and released nearly a quarter of a million terrapin in marshes along the east coast of the U.S.

From the history of the Beaufort Laboratory Web Page:

“In 1909 these (terrapin) studies were transferred back to Beaufort. From then until the 1940's the propagation of terrapins was one of the principal activities of the station. During that period nearly a quarter of a million terrapins were raised. Most were released in the marshes of Virginia, North and South Carolina, and Georgia.”

Historic Economic Importance

Handbook of

TURTLES

The Turtles of the United States,
Canada, and Baja California

By Archie Carr

GRADUATE RESEARCH PROFESSOR, BIOLOGY,
UNIVERSITY OF FLORIDA, AND RESEARCH ASSOCIATE,
THE AMERICAN MUSEUM OF NATURAL HISTORY

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Cornell University Press

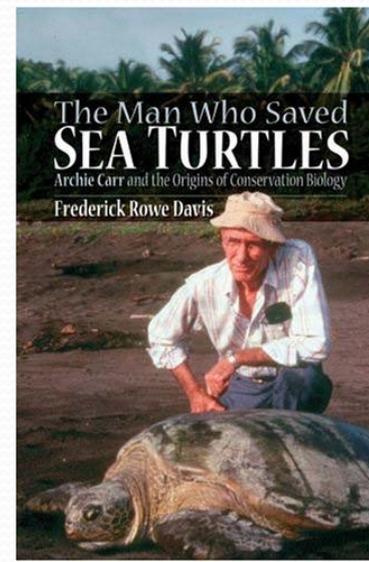
ITHACA AND LONDON

1952

Late 1800's through most of the 20th Century

Economic importance: This is the most famous of the terrapins, the gourmet's delight, and pound for pound the most expensive turtle in the world.

an edge. When I moved to Savannah in 1921 I remember Mr. Barbee, the noted terrapin culturist, saying that he had the previous year received top prices of ninety dollars a dozen for terrapins from his huge pound at Isle



Archie Carr

A MOBILE TERRAPIN FARM.

HOW THE DIAMOND BACKS ARE RAISED AND SHIPPED—A BIG COLLECTION OF THEM.

From the Mobile (Ala.) Register, Jan. 30.

A few days ago an article clipped from a Washington paper appeared in the *Register*, giving a description of Senator Dennis's terrapin farm in Maryland. As we have something of the sort to boast of in the neighborhood of Mobile, it may not be amiss to give our readers a description of Mr. Mulford Dorlon's great terrapin farm at Cedar Point. This projection of land is on the western shore of Mobile Bay, about 30 miles below this city, and is inhabited principally by oystermen who reap golden harvests from the many beds which furnish nearly every oyster brought to the port of Mobile. Mr. Dorlon, who keeps a store at this point, has about three acres fenced in with strong pillings. Leading to this inclosure are two canals, one on the bay side and the other on the gulf side, which supply with salt water a number of ditches 10 feet wide and 100 feet long. The sand accumulating from the excavation of these ditches is thrown on each side, and used by the terrapins to sun themselves and lay their eggs in, which, if counted, would go up in the millions, and can be raked up by the bushel. In the Winter season the terrapins remain imbedded in the mud of the ditches where they stay until Spring time, never touching a morsel of food. A system of sluices enables Mr. Dorlon to keep the ditches full of salt water, or drain them at pleasure, and he is not at all dependent on the tide for that purpose.

The number of terrapins on the farm, as far as can be ascertained and by the closest calculation, is between 20,000 and 25,000, and in the course of the next three or four years will be something hard to calculate. About May 1, Mr. Dorlon makes his purchase of terrapins from the country people on the Mississippi Sound, and takes all he can secure at \$3 a dozen, and that generally averages about 8,000 a year added to his farm, outside of those bred therein. The inhabitants of Mississippi and Alabama hunt the terrapins with dogs trained for that purpose. The dog barks when he finds one, and the hunter immediately secures it by going to the spot where the dog points.

The cost of feeding the terrapins, which, as we have said, is only done in the Summer, is about \$1 per dozen for the season, and the price per dozen in New-York has varied from \$18 to \$8. The food, which consists of crabs and fish, is caught with a seine, in front of the farm, and really very little expense is attached to the raising of these valuable land tortoises. Mr. Dorlon begins to ship about Oct. 1, and then on to about May 10. He generally sends his to Savannah by rail, and thence to New-York by steamer, averaging about 12,000 a season; and, had it not been for a disastrous hurricane, which some time ago washed out Mr. Dorlon's farm, it would be to-day the greatest terrapin farm in the world. He can always ship all he can get, for there is a ready market for these delicacies.

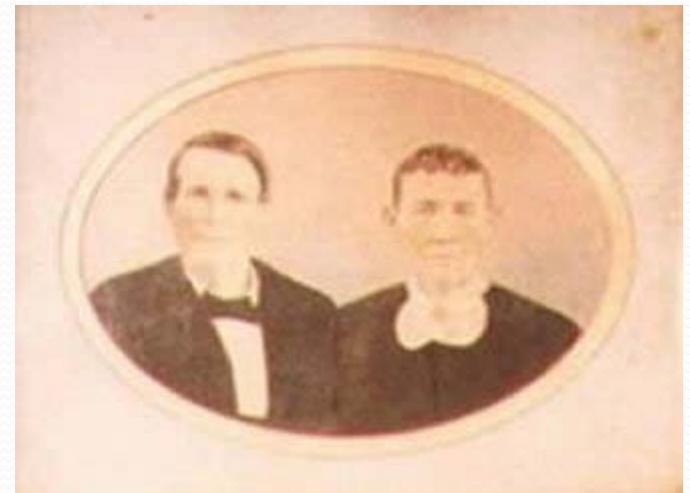
The New York Times

Published: February 4, 1881

Copyright © The New York Times

New York Time Article in 1881
reprinted from the Mobile Register

Cedar Point Marsh



Nathan Mulford Dorlon and Wife
Founder of Turtle Farm at Cedar Point
Late 1800's



1880's Map of Mobile Bay, Dauphin Island, and Bayou La Batre Area of Alabama

Prepared E

ATION OF COLORED LINES.—

J.W. Barber

- Anecdotes regarding terrapin in Alabama:
- He used to find terrapin in abundance in the channel on Little Dauphin Island, and in marshes and channel in Heron Bay. He would continually see large numbers of head popping up in the spring and summer.
- Dragging a seine net through a channel for 20 or 30 minutes could produce enough terrapin to half fill a corn sack.”



Historic Economic Importance

Biloxi Terrapin

Malaclemys terrapin pileata

Handbook of

TURTLES

The Turtles of the United States,
Canada, and Baja California

By Archie Carr

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ITHACA AND LONDON

Economic importance: This subspecies is called by dealers “Biloxi Terrapin” or “Gulf Terrapin” and is said to rank next to the northernmost race in the esteem of expert victualers, among whom it has for many years commanded a good price. It seems strange that this form should be regularly preferred in the trade to the terrapins of the coast of Georgia and the Carolinas, but such is the case.



1952

Alabama Terrapin Tax Enacted in 1923

CODE OF ALABAMA

1975

With Provision for Subsequent Pocket Parts

Prepared under the Supervision of
The Legislative Council

Jerry L. Bassett, Code Commissioner
by

The Editorial Staff of the Publishers

VOLUME 7

2001 REPLACEMENT VOLUME

Including Acts through the 2001 Regular Session and
annotations taken through Southern Reporter,
Second Series, Volume 780, page 672



WEST GROUP

A THOMSON COMPANY

2001

American Digest System:
Fish ☞10.

§ 9-12-45. Tax on terrapins caught, etc., for commercial purposes; minimum legal size; possession of undersized terrapins.

A tax of \$.05 is hereby laid on each turtle or terrapin packed, canned or caught for commercial purposes in this state or the waters within the territorial jurisdiction of this state. It shall be unlawful for any diamond back terrapin measuring less than six inches from the anterior to the posterior

RESOURCES § 9-12-45

en only under the
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of Conservation and
society desiring to
taking, catching or
ers from any of the
lant such oysters in
Code 1923, § 2769;
§, § 139; Acts 1943,
acts 1961, Ex. Sess.,

dam:

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ust pay a tax of \$.06
efs, beds or bottoms
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ts 1923, No. 504, p.
, p. 192; Code 1940,
No. 308, p. 501, § 1;

dam:
C.J.S. Fish § 36.

§ 9-12-46

MARINE RESOURCES

§ 9-12-47

extremes of the body underneath to be caught or taken from the waters of Alabama, and any person having in his possession an undersized turtle shall be guilty of a misdemeanor. (Acts 1923, No. 504, p. 672; Code 1923, § 2769; Acts 1936-37, Ex. Sess., No. 169, p. 192; Code 1940, T. 8, § 139; Acts 1943, No. 422, p. 388, § 1; Acts 1945, No. 308, p. 501, § 1; Acts 1961, Ex. Sess., No. 108, p. 2028, § 1.)

§ 9-12-46. Minimum weight of shrimp taken, etc., for commercial purposes; possession, sale, etc., of nonconforming shrimp.

The Commissioner of Conservation and Natural Resources shall set by regulation the minimum weight requirement of shrimp which are caught or taken from the territorial waters of Alabama for commercial purposes or which are brought into Alabama from waters beyond the territorial jurisdiction of Alabama for commercial purposes; provided, however, that such minimum weight requirement as set by regulation of said Commissioner of Conservation and Natural Resources shall require not more than 68 shrimp with heads attached to weigh one pound and shall require not more than 114 headless shrimp to the pound.

It shall be unlawful for any person, firm, corporation or association to sell, offer for sale or have in possession for sale for commercial purposes any shrimp which require more in number to weigh one pound than the number per pound as set by regulation of the Commissioner of Conservation and Natural Resources.

Any person, firm, corporation or association who or which violates any of the provisions of this section shall be guilty of a misdemeanor and, upon conviction, shall be punished by a fine of not less than \$25.00 nor more than \$100.00 for each offense.

Nothing in this section shall be construed to apply to shrimp which are used solely as bait. (Acts 1939, No. 565, p. 891, § 1; Code 1940, T. 8, § 161; Acts 1947, No. 49, p. 16, § 1; Acts 1951, No. 931, p. 1599, § 1; Acts 1967, No. 569, p. 1322, § 1.)

CROSS REFERENCES

As to standard measure for shrimp, see § 9-12-27.

RESEARCH REFERENCES

American Digest System:
Fish ☞8, 12.

Corpus Juris Secundum:

C.J.S. Fish §§ 26, 28.

§ 9-12-47. Condemnation, disposition, etc., of shrimp not fit for human consumption.

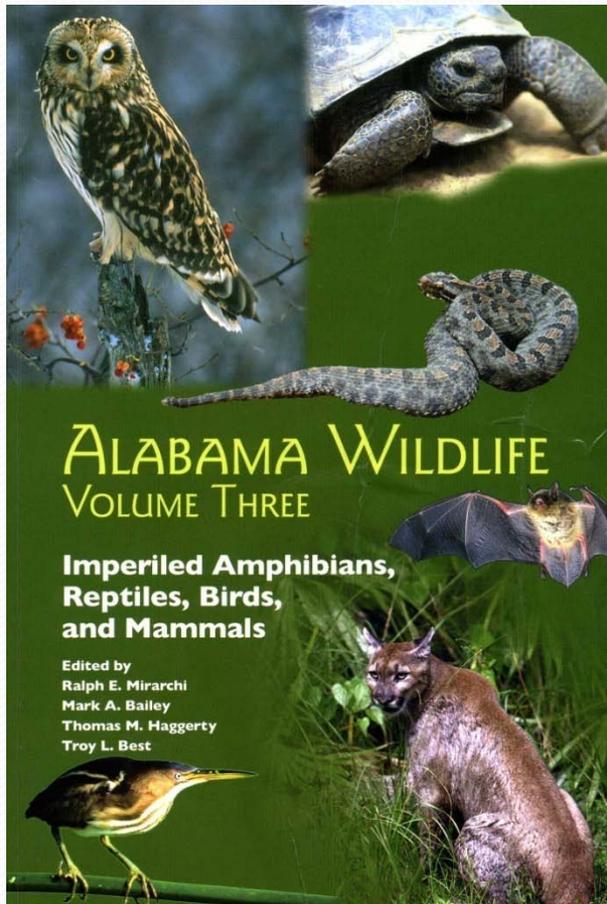
No person shall purchase, sell, can, ship or otherwise transport any fresh saltwater shrimp which are not in prime condition, that is, suitable to be eaten by human beings as food; and, upon condemnation by the Director,

Based on Historic Information

- Terrapin used to be a valuable economic resource in Alabama
- Terrapin used to be very abundant in the salt marshes of Alabama



Species of Highest Conservation Concern



52 ALABAMA WILDLIFE ~VOLUME 3~

MISSISSIPPI DIAMONDBACK TERRAPIN

Malaclemys terrapin pileata (Wied)

OTHER NAMES. None.

DESCRIPTION. A medium-sized (max. length females, 230 mm [9 in.]; males 140 mm [5.5 in.]) brackish-water turtle known to frequent saline habitats. Toes webbed. Adult carapace oval, gray to nearly black, and unmarked; larger carapacial scutes with deep and obvious concentric growth rings. Midline of carapace with row of knobs or bumps, more prominent in females than males. Plastron creamy yellow with some dark spots or blotches. Head and neck smoky gray or light greenish-gray with round black spots. Top of head and limbs usually dark. Mouth consists of a sharp cutting edge and a wide grinding plate on the inner, upper surface. Females bulkier than males, with larger heads, more rounded snouts, deeper shells and shorter tails. Carapace of juveniles rounder and lighter in color, but concentric carapacial ring darker in outline. Seven subspecies currently recognized (Ernst and Bury 1982).



Photo—Ken Maran

DISTRIBUTION. The diamondback terrapin is distributed along coastal North America from Massachusetts to southern Texas. The Mississippi diamondback terrapin is found from the Florida Panhandle to eastern Louisiana. In Alabama, confined to the estuaries, salt marshes, and nearby shallow waters of coastal Mobile and Baldwin Counties, including Dauphin Island (Marion 1986). Size of populations and precise distribution in Alabama very poorly known.

HABITAT. A resident of coastal salt marshes, estuaries, and tidal creeks, so it is restricted to the Gulf Barrier Islands and Coastal Marshes ecoregion. Although particularly associated with cord grass marshes, it does venture from these confines, occasionally being found on offshore sandy islands or on extensive tidal mudflats. Seems to prefer marshes having open channels with moving water nearby. May bask on mud flats or float in channels; not easily captured. Will venture into brackish streams, but will not tolerate fresh water for extended periods of time. May bury in mud. Juveniles may spend first few years under mats of flotsam or vegetation (Ernst et al. 1994).

LIFE HISTORY AND ECOLOGY. Very tolerant of high temperatures, and bask frequently on mud flats or floating debris. Spend the night buried in soft mud in shallow water. Also overwinter in mud but may emerge during periods of warm weather. Copulation takes place in the water in early spring soon after emergence. Details of reproduction of this particular subspecies not well known, but presumably similar to those of other subspecies (Seigel 1979). From two to five clutches laid by each female per season, beginning in April or early May. From five to 12 oblong, pinkish-white and thin-shelled eggs deposited each time in nests dug on beaches or sand dunes above the high-tide mark. Incubation takes 10 to 12 weeks, and young may overwinter in nest. Many nests destroyed by raccoons, fish crows, gulls, and other predators. Hatchlings often fall prey to large wading birds. Sexual maturity probably reached in three to four years in males, six or seven years in females. Maximum egg production occur at about 25 years. Upper age limit may exceed 40 years. Large muscular jaws are well adapted to crush and eat hard-shelled prey such as molluscs and crustaceans. Primary food items include snails, clams

Salt Marsh Survey Sites



Field Methods 2004-2005

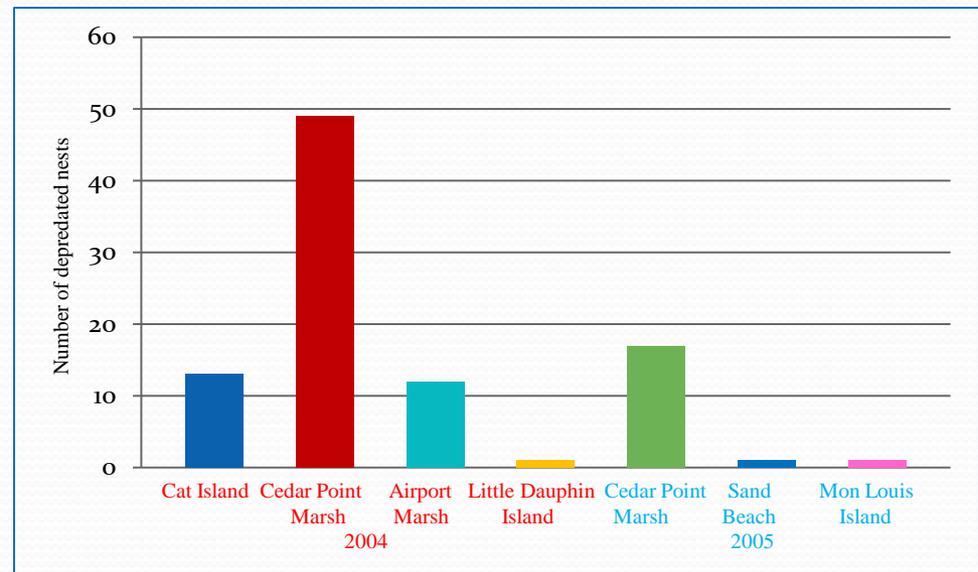


- Gather baseline data to assess the survival status of terrapin in Alabama
- Is the Alabama population of terrapins currently depleted?
- Multiple survey methods were utilized
 - 1) Head surveys in marshes
 - 2) Modified crab traps in marshes
 - 3) Depredated nest surveys on potential nesting beaches
 - 4) Drift fences with pitfall traps on known nesting beaches

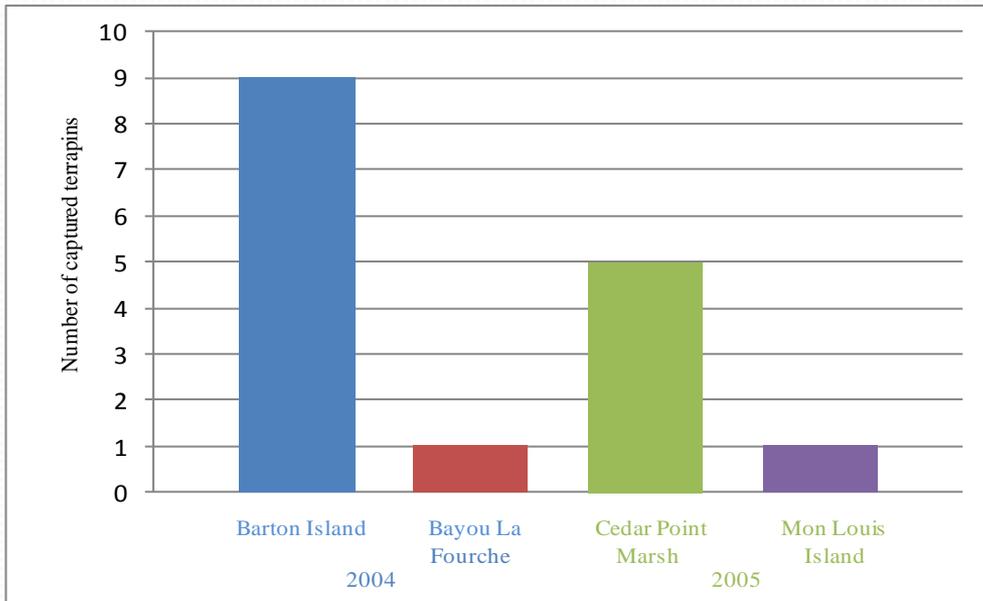
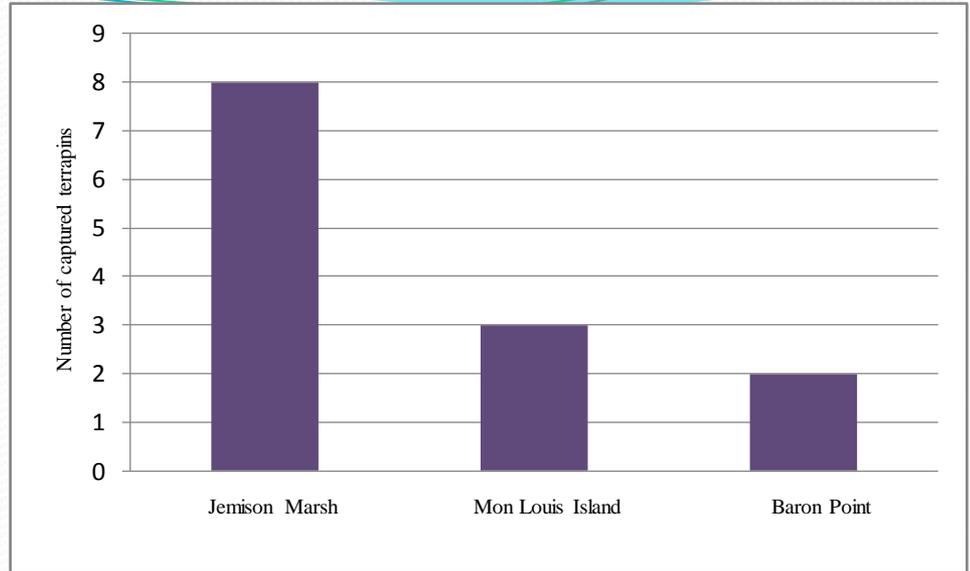
Location	# of surveys	# of heads/min	# of heads/30 min
Cedar Point Marsh	5	0.12	3.6
Heron Bay	1	0.27	8
Airport Marsh	3	0.03	0.8
Little Dauphin Island	2	0.12	3.6
Barton Island	1	0	0
Mon Louis/Cat Island	2	0.7	2.2
BS	1	0.13	4
Fowl River	1	0	0
Point Aux Pines	1	0	0

Head survey efforts

Depredated nest surveys



Terrapin capture with modified crab traps

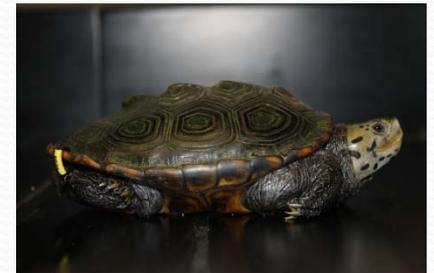


Terrapin capture with pitfall traps

Field Methods 2006-2010



- Continue gathering baseline data to assess the survival status of terrapin in Alabama
- Multiple survey methods were utilized
 - 1) Head surveys in marshes
 - 2) Modified crab traps in marshes
 - 3) Depredated nest surveys on potential nesting beaches
 - 4) Drift fences with pitfall traps on known nesting beaches
 - 5) Otter trawl in marshes
- Collected suite of morphological measurements, estimated age, and extracted blood sample
- Inserted PIT tags and shell tags

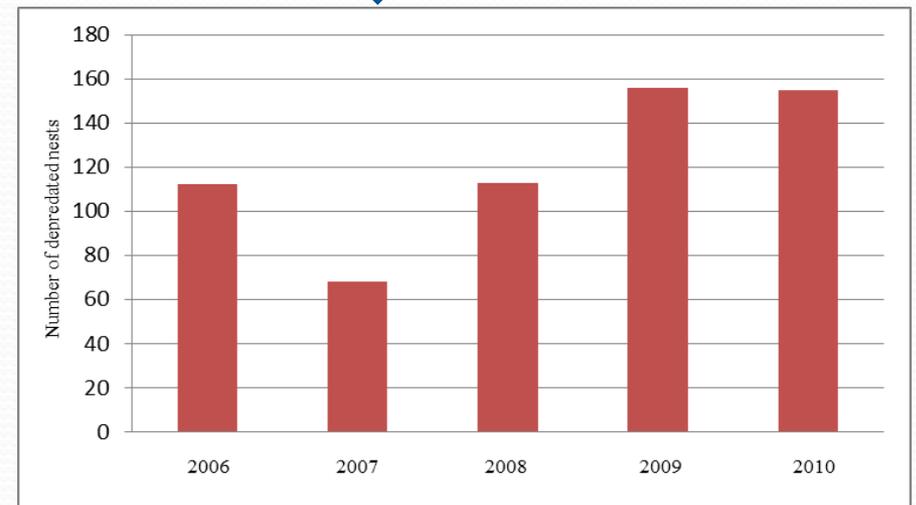
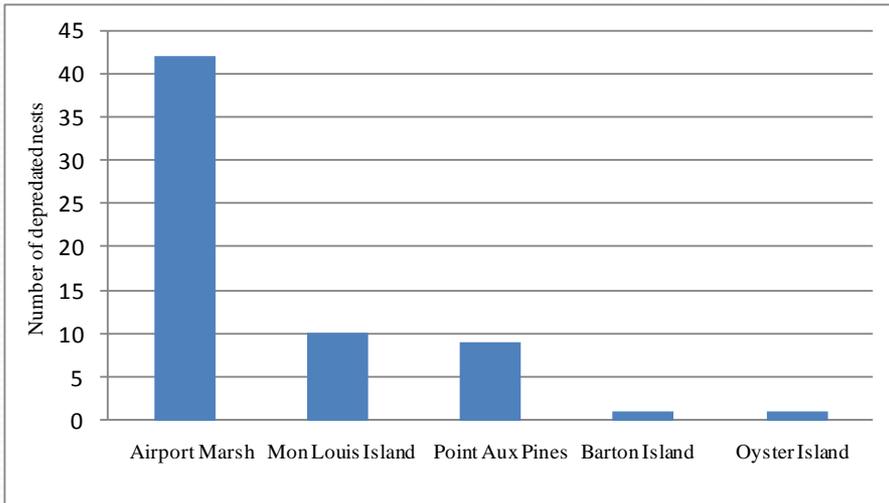


Location	# of surveys	# of heads/min	# of heads/30 min
Airport Marsh	20	0.030	0.895
Little Dauphin Island	15	0.0132	0.396
Jemison Marsh	10	0.064	1.915
Mon Louis/Cat Island	3	0.0286	0.857
Barton Island	1	0	0

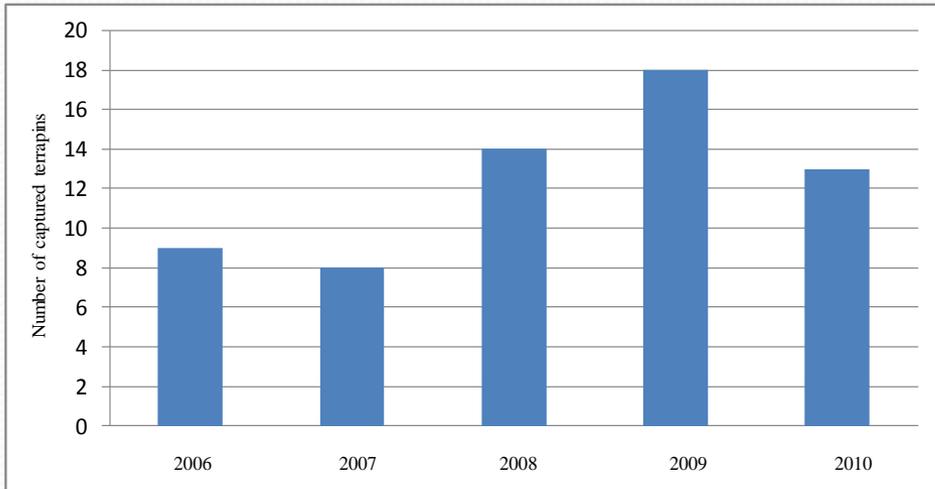
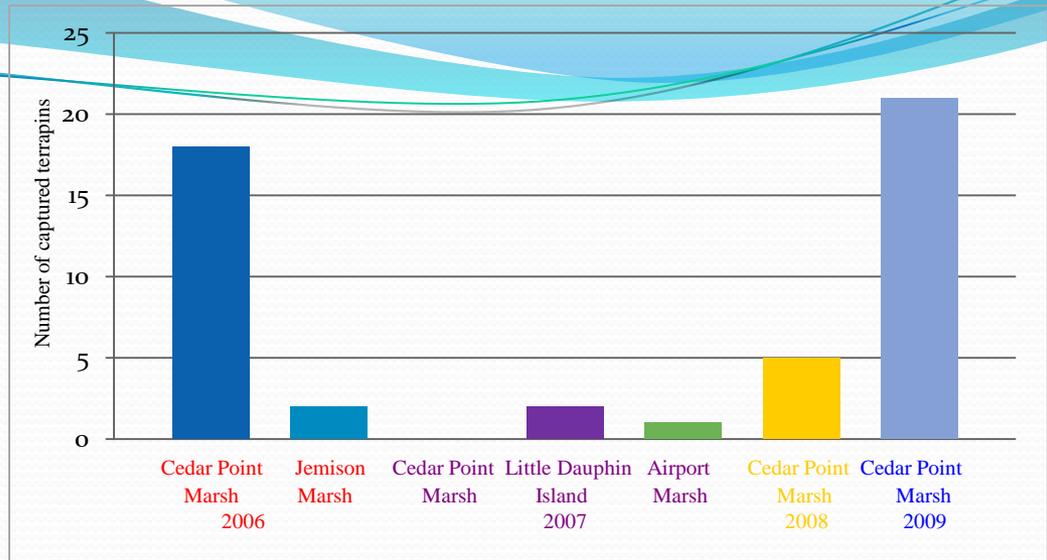
2006-2010 Total Data for Other Locations

Year	# of surveys	# of heads/min	# of heads/30 min
2006	16	0.053	1.58
2007	23	0.084	2.53
2008	42	0.093	2.79
2009	37	0.13	3.99
2010	28	0.14	4.07

2006-2010 Cedar Point Marsh Data

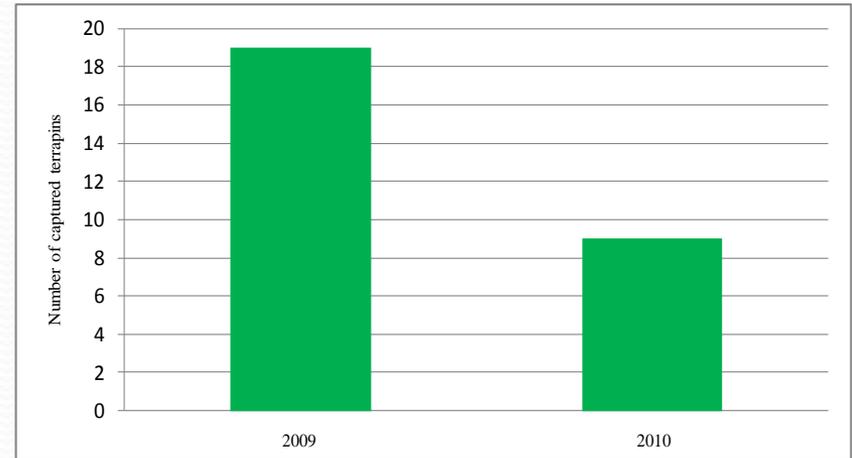


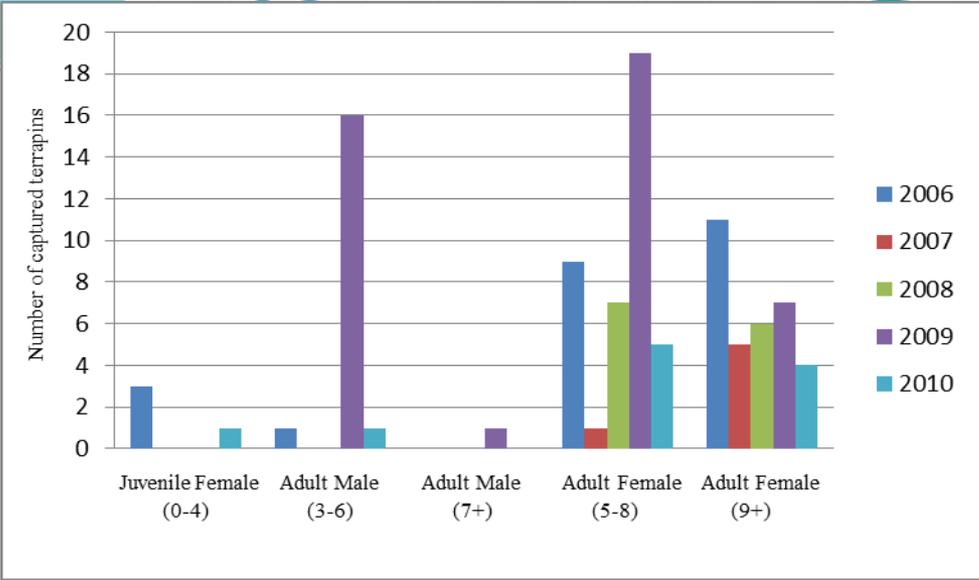
Terrapin capture with modified crab traps



Terrapin capture with trawling

Terrapin capture with pitfall traps

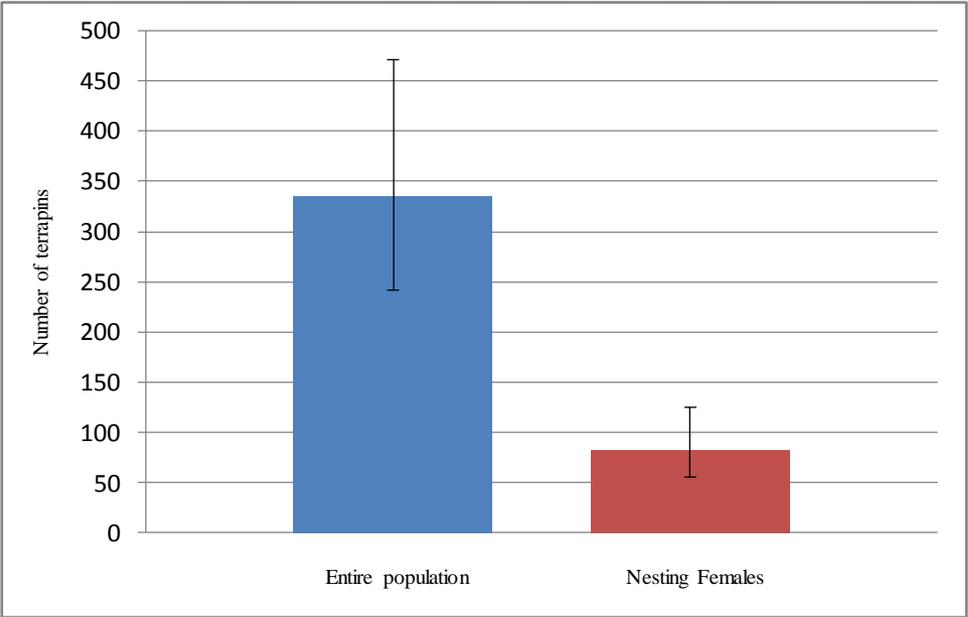




Population consisted of more older adult females and more younger adult males

97 captures with 38 recaptures

Utilized Schabel method with Chapman's modification to estimate total population excluding 0-2 year olds and population of nesting females



Conclusions from Population Study

- Diamondback terrapins exist in Alabama in several isolated remnant aggregations with Cedar Point Marsh supporting the largest aggregation
- Crab trap mortality and nest predation represent the biggest threats to terrapins in Alabama





- 4 out of the 12 loci significantly deviated from Hardy-Weinberg equilibrium



- Mean M ratio for Alabama population was 0.34 with a S.E. of 0.05

Conservation Strategy

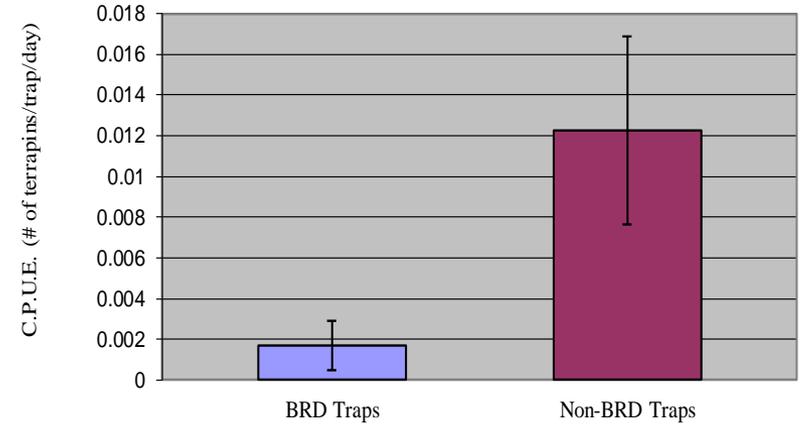
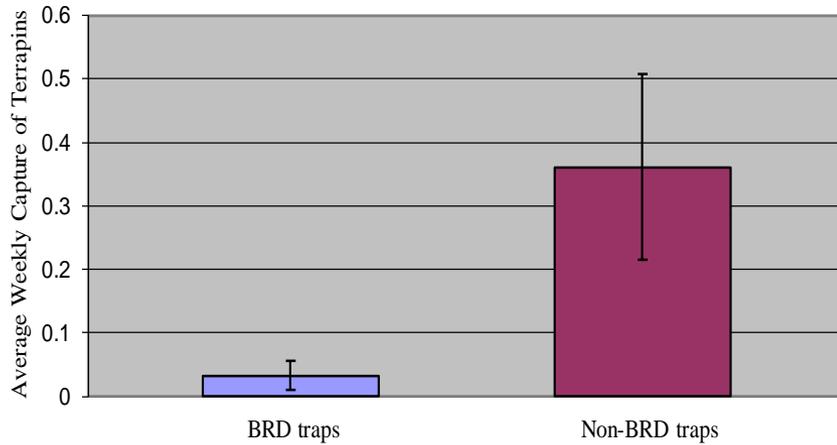
- Evaluation of By-Catch Reduction Devices
- Head-Start Program



Evaluation of By-catch Reduction Devices

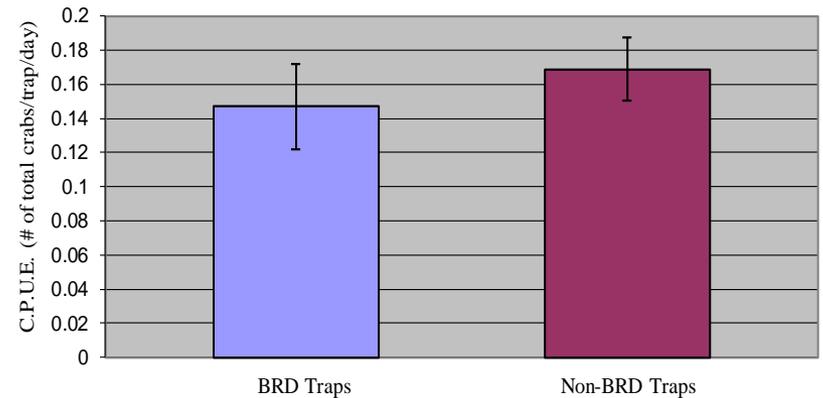
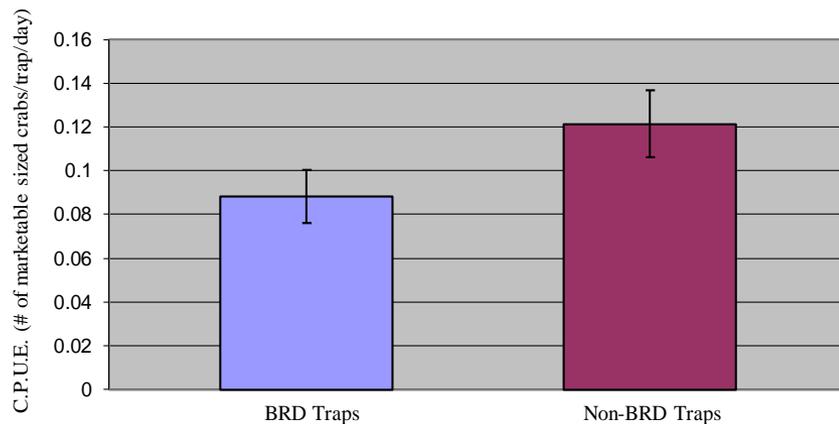
- BRD's developed by Wood (1997) and are inserted in crab trap funnel openings to prevent terrapin entry yet still allow crab capture
- Guillory and Prejean (1998)
- Side-by-side comparison to evaluate efficacy of BRD's in Cedar Point Marsh in 2007-2009
- Do BRD's prevent terrapin capture without affecting crab capture in Alabama?





Terrapin Data-90% reduction in terrapin capture with BRD traps

Crab Data-low sample size compared to other studies (543 vs. 140,000 in Mississippi (Darcie Graham, GCRL))



Conclusions from BRD study

- By-catch reduction devices were effective at preventing crab trap entry of terrapins
- Terrapin capture was order of magnitude lower than other areas (0.17 terrapins/trap/day in Maryland (Roosenburg *et al.*, (1997))
- Crab capture indicated that Cedar Point Marsh may not be an lucrative crabbing location



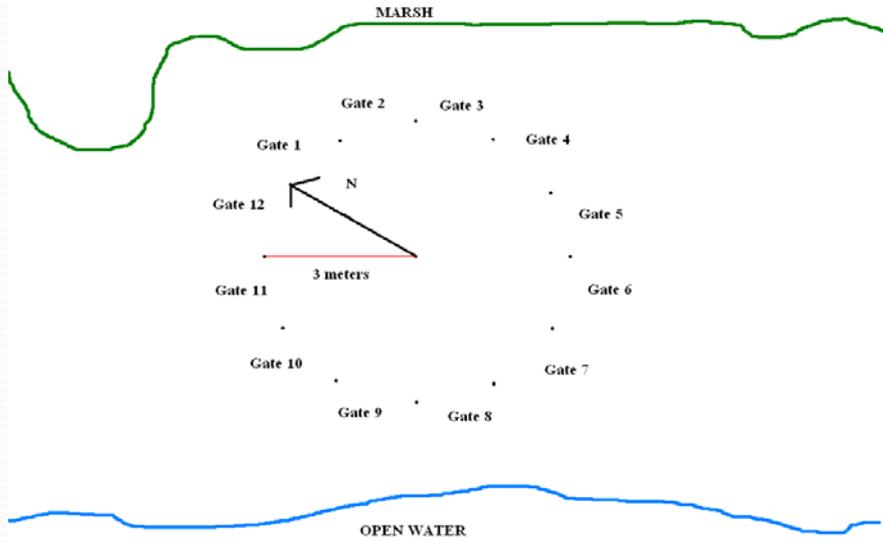
Head-Start Program

- Initiated in 2008
- Eggs obtained from females that were captured on nesting beach at Cedar Point Marsh
- Avoided high mortality associated with egg and hatchling life stages
- Incubated in U.A.B.'s animal facility at either 31°C or 26°C
- Initial efforts that will take several years to monitor success



- 2008-12 clutches resulting in 62 hatchlings
- 2009-14 clutches resulting in 91 hatchlings
- 2010-10 clutches resulting in 82 hatchlings
 - Raise them to a size of approximately 200-300 g
- To date, 48 yearlings have been released, 95 yearlings that are ready for release, and 66 others that may be ready to release by fall for a total of 209
 - Will continue to sample Cedar Point Marsh to monitor yearlings' success
 - Allow for investigations of additional aspects of terrapin biology and ecology

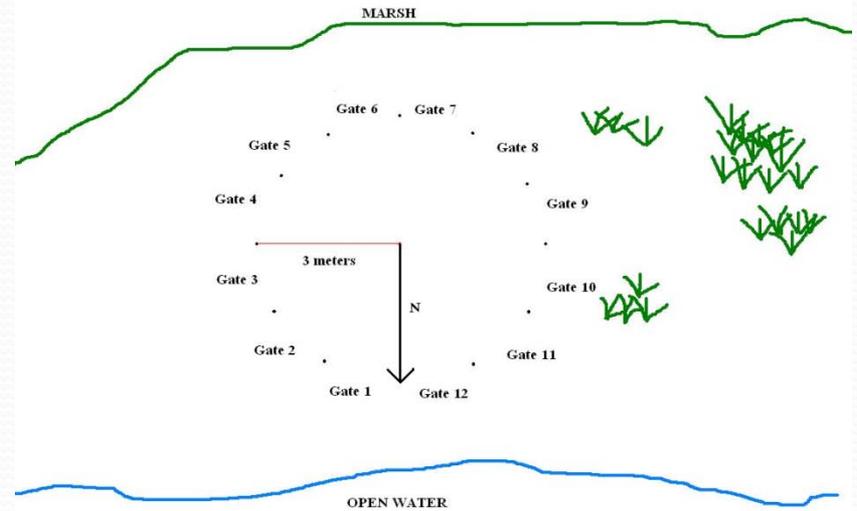




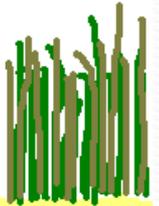
Cedar Point Marsh



Airport Marsh



Use same cues to go in opposite direction!



Size has its advantages



Overall Conclusions

- The diamondback terrapin population in Alabama has experienced an historic decline and has not rebounded and is currently represented by small aggregations
- Population decline was reflected in microsatellite DNA diversity, which could indicate inability to adapt to future environmental stresses
- Crab trap mortality and nest predation are the two biggest threats impacting the Alabama population
- BRD's are an effective management tool to prevent crab trap mortality
 - Derelict crab trap removal program

Overall Conclusions

- Head-start program may provide an accelerated recovery rate
 - Half-way technology (Frazer, 1992)
- Loss of larger, older females from a population could result in additional elimination of the most successful hatchlings from future reproductive outputs
- All life history stages of terrapins require abundant marsh habitat adjacent to nesting beaches

Protection of Cedar Point Marsh

Home > Breaking News from the Press-Register > Breaking News

Conservation grant to make terrapin habitat Forever Wild

Published: Friday, December 24, 2010, 8:16 AM



By Guy Busby Press-Register

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A baby diamondback terrapin found during a 2008 study in south Mobile County is held by a researcher. A \$1 million federal grant announced this week will allow the state to buy a 520-acre tract that includes the last known habitat of the turtle in Alabama, according to conservation officials. The species is listed as being of "highest conservation concern" by the Alabama Department of Conservation and Natural Resources. (Press-Register/Bill Starling)

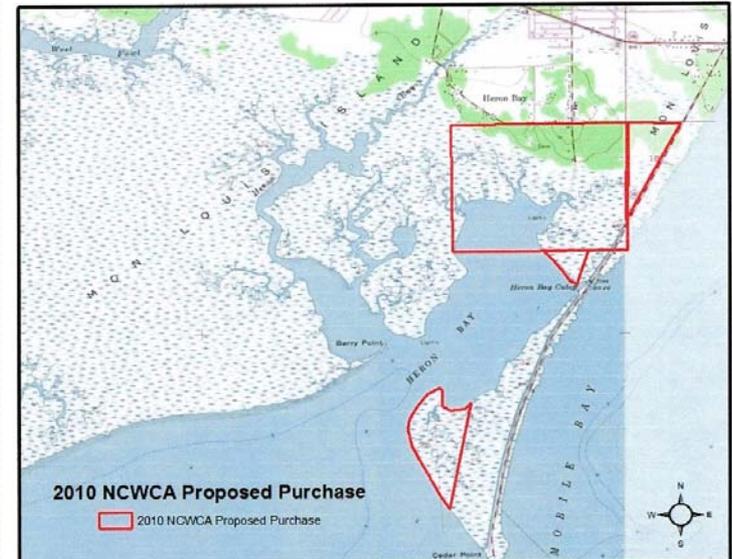
A \$1 million federal grant will allow the last known Alabama habitat of the diamondback terrapin turtle to be added to the state Forever Wild program, conservation officials said Thursday.

The grant was part of a \$19 million appropriation for 24 coastal wetland protection projects announced this week by U.S. Secretary of the Interior Kenneth Salazar.

The local grant will allow the Alabama Department of Conservation and Natural Resources to buy a 595-acre wetland tract on Heron Bay and 520 acres on Portersville Bay in south Mobile County, Interior Department spokeswoman Roya Mogadam said. The tracts will be added to 5,151 acres of wetlands being managed by state

officials in the area, she said.

The property will be added to the state Forever Wild program, Chris Smith, state lands manager for



Collaborators and Funding

- Committee: Thane Wibbels, Ken Marion, Bob Thacker University of Alabama at Birmingham
- David Nelson, University of South Alabama
- Willem Roosenburg, Ohio University
- Additional Collaborators: John Dindo, Dauphin Island Sea Lab, Joel Borden and Gabe Langford, University of South Alabama, Jordan Gray, Armstrong Atlantic State University

- **University of Alabama at Birmingham Biology Department**
- **Alabama Center for Estuarine Studies**
- **Alabama Department of Conservation and Natural Resources**
 - State Wildlife Grants Program
- **Alabama Academy of Science**
- **Birmingham Audubon Society**
- **UAB Graduate School**

The logo for the University of Alabama at Birmingham (UAB), featuring the letters 'UAB' in a bold, green, sans-serif font.The logo for the Alabama Center for Estuarine Studies (ACES), featuring the letters 'ACES' in a large, blue, serif font over a background of a coastal landscape. To the right, the text 'Alabama Center for Estuarine Studies' is written in red.

DCNR



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- Family and Friends



Questions?

