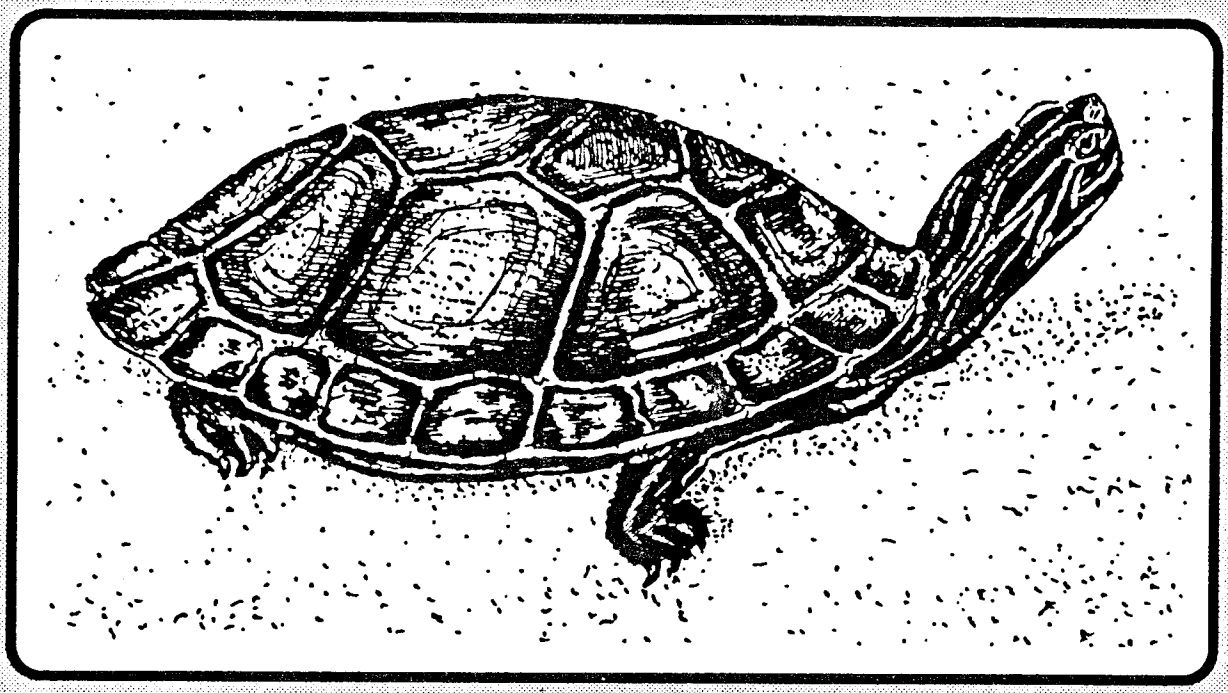
# Alabama Red-bellied Turtle Recovery Plan



U.S. Fish and Wildlife Service
Southeast Region, Atlanta, Georgia

# ALABAMA RED-BELLIED TURTLE

# (*Pseudemys alabamensis*)

# RECOVERY PLAN

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Recovery plans delineate reasonable actions which are believed to be required to recover and/or protect the listed species. Plans are prepared by the U.S. Fish and Wildlife Service, sometimes with the assistance of recovery teams, contractors, State agencies, and others. Objectives will only be pursued and funds expended contingent upon appropriations, priorities, and other budgetary constraints. Recovery plans do not necessarily represent the views nor the official positions or approvals of any individuals or agencies, other than the U.S. Fish and Wildlife Service, involved in the plan formulation. They represent the official position of the U.S. Fish and Wildlife Service only after they have been signed by the Regional Director or Director as approved. Approved recovery plans are subject to modification as dictated by new findings, changes in species' status, and the completion of recovery tasks.

Literature Citations should read as follows:

U.S. Fish and Wildlife Service. 1989. Alabama Red-bellied Turtle Recovery Plan. U.S. Fish and Wildlife Service, Jackson, Mississippi. 17 pp.

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# EXECUTIVE SUMMARY

Current Status: The Alabama red-bellied turtle inhabits streams, lakes, and sloughs associated with the lower part of the Mobile Bay Drainage in Baldwin and Mobile Counties, Alabama. Data on population status and trend remains inconclusive. However, age class data suggest a declining population trend for this turtle. The decline is thought to be caused mostly by disturbance and predation, primarily in the nesting areas.

Goal: To reclassify the Alabama red-bellied turtle from endangered to threatened status.

Recovery Criteria: The Alabama red-bellied turtle can be considered for reclassifying to threatened when long-term protection has been established for three nesting habitats; basking, feeding and overwintering habitats have been protected; and 15 years of data demonstrates that the population trend is increasing.

Actions Needed:

1. Determine basic parameters of population biology and ecology;

2. reduce disturbance and predation of eggs, young and adults; and

3. protect nesting, basking, and overwintering habitats.

Date of Recovery: Specific recovery management actions cannot be initiated until the priority one recovery action studies have been funded and conducted. Recovery could reasonably be expected about 20 years after completion of the studies.

Total Cost of Recovery: There is no basis for determining total costs until studies have been completed and conservation guidelines have been developed.

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# PART I: INTRODUCTION

## Background

On June 16, 1987, the U.S. Fish and Wildlife Service (Service) published a final rule (Federal Register, 52:22939-22943) indicating its determination that the Alabama red-bellied turtle (Pseudemys alabamensis) is an endangered species under the Endangered Species Act of 1973, as amended. Although recognized as taxonomically distinct as early as 1856 (Agassiz 1857), the Alabama red-bellied turtle was not formally described until 1893 from specimens from Mobile Bay in the Gustav Kohn collection, now in the National Museum of Natural History, Washington, D.C. (Baur 1893). The Alabama red-bellied turtle is recognized as valid by Carr and Crenshaw (1957), Ernst and Barbour (1972), Mount (1975), McCoy and Vogt (1979), Pritchard (1979), Ward (1984), and Dobie (1985a, 1986).

## Description

This is a relatively large, freshwater, herbivorous turtle attaining a carapace length of 33 centimeters (13 inches). It normally has an orange to red plastron and at the tip of the upper jaw a prominent notch bordered on each side by a toothlike cusp. The elongate carapace is high-domed, its highest point often anterior to midbody, where the carapace is widest. The background carapace coloration is brown, olive, or black with yellow, orange, or red distinct vertical markings. The skin is olive to black with yellow to light orange striping.

Characteristics most useful for distinguishing this species from other members of its genus include the number and configuration of stripes on the head (Ernst and Barbour 1972, Mount 1975, Dobie 1985a, 1986) and the presence of flanking cusps on each side of a terminal notch in the upper jaw. The Alabama red-bellied turtle has more stripes than the Florida red-bellied turtle (Pseudemys nelsoni), and both the former and latter have a prefrontal arrow normally absent in the river cooter (Pseudemys concinna) and the Florida cooter (Pseudemys floridana).

## Distribution

The Alabama red-bellied turtle inhabits streams, lakes, and sloughs associated with the lower part of the Mobile Bay Drainage in Baldwin and Mobile Counties, Alabama (Figure 1). It was once found as far north as the lake in Little River State Park (Mount 1975) in southern Monroe County. It is now known to occur only as far north as David Lake, Mobile County. The turtle appears to be most abundant in the Tensaw River, Baldwin County, from a point adjacent to Hurricane Landing southward along the northernmost part of Mobile Bay, north of Interstate Highway 10 (a stretch of 21 kilometers or 13 miles). It is occasionally reported from Dauphin Island, Mobile County, but is not thought to breed there (Jackson and Jackson 1970). Reports of this species from Florida (Carr and Crenshaw 1957) are believed to be P. nelsoni, P. floridana or P. concinna (Mount 1975). Records from Texas and Tennessee, also cited by Carr and Crenshaw (1957),


Figure 1. Range of the Alabama Red-bellied Turtle

are probably P. concinna based upon examination of numerous Pseudemys specimens collected from the Gulf Coast states westward through Texas and including Tennessee (Dr. James Dobie, Auburn University, personal communication, 1985). The specimens from Texas and Tennessee, originally identified as P. alabamensis, are not available for examination. The early record of the Alabama red-bellied turtle from the Tchoutacabuoffa River in Mississippi and four specimens captured more recently in the Pascagoula River in Mississippi are believed to be an undescribed member of the P. rubriventris-P. nelsoni-P. alabamensis complex. This suspected new taxon is currently being studied by Dr. James Dobie.

## Description of the Habitat

The Alabama red-bellied turtle lives in broad, vegetated expanses of shallow water (1-2 meters or 3.3-6.6 feet in depth) in the backwater areas of bays (McCoy and Vogt 1979, Dobie 1985a) and in and along river channels (Dobie 1986). Dobie (1985a) suggests that the snags and dense beds of submersed and emergent aquatic vegetation provide turtles with a substrate for cover, predator avoidance, food, and for thermoregulation by basking. A known major nesting site is the dredged material disposal area on Gravine Island. The bank of the causeway across Mobile Bay is assumed to also be a nesting site (Dobie 1985a).

## Current Status and Population Trends

Data on population status and trend remains inconclusive. Total population size of this species is unknown. McCoy and Vogt (1979) provide data on the relative abundance of this turtle. Only 20 turtles were trapped in 42 days of sampling. Dobie (1985a) questioned the utility of the relative abundance data since trapping is more opportunistic than systematic. However, age class data (Dobie 1985b) showed an apparent decline of young turtles in the population between 1970 and 1983. Of the 24 individuals collected from 1968 to 1970, 10 were juveniles and small adults, whereas only 1 of 20 collected between 1971 and 1983 was a juvenile or small adult.

## Reasons for Decline and Continuing Threats

Dobie (1985a) suggested that the decline in recruitment to the Alabama red-bellied turtle population was caused mostly by disturbance and predation on the Gravine Island dredged material disposal site, the only known major nesting area.

The concentration of turtle nests on this sparsely vegetated disposal area has made them easy prey for predators with the ability to locate and dig up nests (Dobie 1985a). During the 1960's, domestic pigs were released on Gravine Island and were shortly thereafter observed as aggressive predators of turtle eggs. As the pig population decreased, crows replaced them as primary predators during the 1970's (Dobie 1985a). Crow predation of turtle nests on the island's dredged material disposal area is currently the most obvious cause for the decline of juveniles in the population. Of nine red-bellied turtle nests (containing 3-6 eggs each) found between May

27 and July 15, 1978, all had been destroyed by crows (Meany 1979). Comparable predation rates were noted during the summer of 1985 (B. Weisberger, Auburn University, personal communication, 1985). Lahanas (1982) noted 95 percent of the black-knobbed sawback turtle (Graptemys nigrinoda) nests on the island were destroyed. Fire ants may also prey upon turtle eggs, as they have been found in nest chambers of the Alabama red-bellied turtle (See Mount 1981, and Mount et al. 1981, for possible significance of predation of fire ants on reptile eggs).

The Alabama red-bellied turtle has also been, and continues to be, detrimentally affected by human activities on this disposal area. Dobie (1985a) reported that local residents formerly spent several days a year gathering and eating eggs. This practice has now stopped, apparently because of the decreased number of turtle eggs available. Nesting is also likely inhibited by camp lights, people, and noise associated with recreational use of the area during the nesting season. Dobie (1985a) reported increasingly heavy use of sand beach nesting habitat by campers on summer weekends and holidays during times when turtles were nesting. Three-wheeled vehicles driven over these sand beaches uncovered turtle nests, resulting in dehydration, predation, and breakage of eggs (B. Weisberger, personal communication, 1985).

The remainder of the turtle's habitat is not as disturbed as this nesting island. However, Dobie (1985a) observed a substantial reduction in the amount of aquatic vegetation in the Tensaw River, south of Clover Leaf Landing. Mike Eubanks (Mobile District, U.S. Army Corps of Engineers, personal communication, 1986) indicated that the Corps and State of Alabama had treated a limited amount of aquatic habitat with the herbicide 2,4-D within the Lower Mobile River drainage area. These treatments started in the 1950's and were limited to only a few small areas. The Corps discontinued its water hyacinth (Eichornia crassipes) spray program in 1978. However, a cooperative State of Alabama/Corps of Engineers aquatic plant control program was initiated in 1981. The State of Alabama chemical treatments were initiated primarily to control introduced aquatic vegetation, such as Eurasian watermilfoil (Myriophyllum spicatum). Historically, natural phenomena, such as movement of salt wedges up into bays during hurricanes, likely accounts for major fluctuations in aquatic vegetation along the Lower Mobile River area. These natural changes in habitat quantity probably had no permanent impact on the species; turtle numbers were reduced in years immediately following hurricanes, but increased as aquatic vegetation became reestablished.

Finally, some Alabama red-bellied turtles have been trapped and sold as pets and food (Dobie 1985a). Headlights and dip nets have been used to collect turtles in weed beds during warm months, especially for the pet trade (Dobie 1985a). Pet dealers have advertised this species for up to 25 dollars per turtle (Dobie 1985a). Trawling has been used to obtain dormant and semi-dormant overwintering turtles for sale as food according to reports from local residents in the area (Dobie 1985a). In addition, Alabama red-bellied turtles are incidentally harvested by commercial fishermen in gill, hoop, and trammel nets, by crab fisherman in crab traps,

and by shrimpers in shrimp trawls (McCoy and Vogt 1979, Dobie 1985a, Dobie 1986, Weisberger, personal communication, 1985).

## PART II: RECOVERY

### A. Objective

Objective: To reclassify the Alabama red-bellied turtle from endangered to threatened status.

The criteria for the change from endangered status to threatened status for the Alabama red-bellied turtle are: (1) documentation of long-term protection of three nesting habitats; (2) protection of basking, feeding, and overwintering habitats (the amount and location of this habitat must be determined after completion of Task 2.); and (3) 15 years of data as a reasonable duration to justify a determination that the population trend is increasing (based on number of nests, juvenile/adult ratio, sex ratio, and number of adults).

### B. Narrative Outline

1. Determine Alabama red-bellied turtle population structure, trends, and reproductive success. The Alabama red-bellied turtle population is apparently declining and may become extinct unless recovery actions can be effectively taken to stop the decline. The life history of the species is unknown. A study to correct this deficiency is a prerequisite to development of a relevant recovery plan. The apparent declining population of this historically rare species is thought to be due to low recruitment during the last couple of decades. Data from the life history study must be quantitative and will be obtained in an initial 3-year, intensive effort followed by a resurvey of all parameters at 3-year intervals.

   1.1 Determine sex ratio of adults, size and age at maturity, survival rates by sex and age classes, and population trends. Knowledge of survival rates by sex and age class is necessary for appraisal of the population status, identification of management needs, and assessment of time needed for recovery. The sizes of females need to be determined because size is related to reproductive output. Data will be obtained by trapping and individually marking turtles, visual inspection of adults to determine sex ratio, measurements of carapace and plastron, and aging to the extent possible by reading of annuli. The latter technique will have to be verified by comparisons between annuli counts and mark and recapture data. Assessment of population trends will be based on juvenile/adult ratio and number of clutches laid per year.

   1.2 Determine reproductive success on known nesting areas. Knowledge of total reproductive output, clutch survival rate, and total recruitment per annum will allow an assessment of the population's potential for growth. It will also allow assessment of the effectiveness of recovery efforts.

2. Study Alabama red-bellied turtle ecology. The cause of the apparent population decline is thought to be disturbance and predation in the nesting area. Little specific information is available concerning the relationship between the turtle and its environment. Those ecological relationships, including the disturbance and predation aspects, must be studied as the basis for the scope and design of recovery actions if the declining population trend is to be stopped. Information on behavior, habitat requirements, and location of essential habitats must be obtained to allow for implementation of appropriate protective measures.

2.1 Study reproductive behavior, factors limiting recruitment, identify nesting sites within its occupied range, and determine nesting habitat requirements. A better understanding of general reproductive behavior will help to (1) assess the impacts of disturbance and predation upon nesting success and, (2) manage any adverse activities to reduce their impacts. Behavioral information such as the length of the nesting season will be used to determine the time periods necessary for protection of nesting grounds. The number of clutches laid per annum by an individual will be needed to assess reproductive potential.

Sites where nesting is currently known to occur are limited to the Gravine Island dredged material disposal site and the bank of the causeway which crosses Mobile Bay. Likely other nesting sites include the natural Tensaw River levee and alligator nests. These and other potential nest sites should be investigated for Alabama red-bellied turtle nests. Information on nest sites may be obtained by searching.

Nesting habitat will be studied in each known nesting site. Parameters to be considered will include soil type, temperature, moisture, vegetative cover, orientation to sun, proximity to water, nest depth, placement of nests, exposure to invertebrate and vertebrate predators, vulnerability to human disturbance, and the influence of dredge spoil disposal areas on concentrating nesting and increasing predation.

2.2 Study feeding behavior, determine food items, and identify significant feeding habitats. This task will include stomach flushing, radio telemetry, and mapping of significant feeding habitats. An assessment of natural and man-made threats to the turtle's food supply will be made. Herbicides that may be damaging this food supply should be identified by discussions with authorities and by literature reviews.

2.3 Study basking behavior and basking site requirements. Basking comprises a major portion of this species' activities and fulfills a physiological need of the species. Data on this behavior's significance and the habitat requirements to satisfy it may be needed to prevent clearing, snagging, and dredging of important habitat.

2.4 Study overwintering behavior, determine habitat requirements, and locate important overwintering sites. Little is known about this aspect of the turtle's life history. It must be better understood to allow for management of human activities which could harm the turtles while overwintering. This task will likely be carried out through the use of radio telemetry.

3. Protect the Alabama red-bellied turtle and its habitats. This task will use information gathered in Tasks 1. and 2. to protect the turtle.

3.1 Prepare guidelines for conservation of the species and its habitat. Management of the habitat for this species will be a key to its survival as human activities continue to encroach upon it. Upon completion of Task 2., recommended guidelines for protecting the Alabama red-bellied turtle and its habitat should be prepared. The guidelines will briefly summarize the needs of the species and recommend the steps to be taken to insure its protection. The management ideas developed will be provided to individuals, private businesses, and local, State, and Federal governments.

3.2 Significantly reduce nest depredation and human disturbance. Egg depredation and human disturbance is thought to be drastically depressing nesting success of Alabama red-bellied turtles on the island's dredged material disposal nesting area. If information acquired through Tasks 1 and 2 confirm this presumption, implementation of these tasks could be critical to stopping the population decline and ultimate extinction. Potential control measures include placement of screens around or over nests, or even movement of nests to a protected area.

3.3 Obtain authority to manage habitats. Stopping the population decline and ultimate extinction may require authority to implement management actions to correct the cause of the problem. The necessary conservation agreements, easements, or fee title acquisition should be obtained to allow significant habitats to be properly managed.

3.4 Protect the species through law enforcement. The assistance of local, State, and Federal law enforcement authorities may be necessary to prevent egg removal, destruction of nests, shooting, and collection of the turtles for food, pets or other purposes. Human use of the island's dredged material disposal nesting area should be prohibited when the Alabama red-bellied turtle is nesting and when hatchlings are emerging.

3.5 Prohibit snagging and dredging in important basking areas. Basking is an important behavior of this species. Snags and mats of vegetation are used as basking sites and therefore should not be removed.

3.6 Prevent destruction of aquatic vegetation used by the turtle for basking, cover and food. The local, State, and Federal agencies involved in management of aquatic vegetation in habitats occupied by this species should be made aware of the requirements of this species for aquatic vegetation. Conservation Agreements should be established to ensure protection of the turtle's food, basking, and cover needs from destruction by herbicide application, and dredging operations.

4. Provide conservation education for the public on the Alabama red-bellied turtle, its habitat, and factors threatening its survival. This is necessary to obtain public understanding and support for conservation efforts on behalf of this species.

4.1 Prepare conservation education poster. A poster should be prepared about the turtle and its habitat for distribution to schools, libraries, local, State and Federal governments, various conservation groups, and fish camps.

4.2 Provide periodic news releases, popular articles and educational talks. The public should be kept informed about the status of the turtle population, threats to its continued survival, and efforts to bring about its recovery.

4.3 Prepare scientific publication. Little has been published about this species in the scientific literature. Therefore, to increase awareness about this species among the scientific community, a manuscript should be submitted to a refereed scientific journal on the various aspects of the life history, status, etc., of the Alabama red-bellied turtle.

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## PART III: IMPLEMENTATION SCHEDULE

The following Implementation Schedule outlines actions and costs for the Pseudemys alabamensis recovery program. It is a guide for meeting the objectives elaborated in Part II of this plan. This schedule indicates the general category for implementations, recovery plan tasks, corresponding outline numbers, task priorities, duration of tasks, (continuous denotes a task that should continue on an annual basis), which agencies are responsible to perform these tasks, and lastly, estimated costs for U.S. Fish and Wildlife Service tasks. These actions, when accomplished, should bring about the recovery of Pseudemys alabamensis and protect its habitat.

## KEY TO IMPLEMENTATION SCHEDULE COLUMNS 1 & 4

General Category (Column 1):

Information Gathering - I or R (research)

1. Population status
2. Habitat status
3. Habitat requirements
4. Management techniques
5. Taxonomic studies
6. Demographic studies
7. Propagation
8. Migration
9. Predation
10. Competition
11. Disease
12. Environmental contaminant
13. Reintroduction
14. Other information

Acquisition - A

1. Lease
2. Easement
3. Management agreement
4. Exchange
5. Withdrawal
6. Fee title
7. Other

Other - O

1. Information and education
2. Law enforcement
3. Regulations
4. Administration

Management - M

1. Propagation
2. Reintroduction
3. Habitat maintenance and manipulation
4. Predator and competitor control
5. Depredation control
6. Disease control
7. Other management

Priority (Column 4):

1 - An action that must be taken to prevent extinction or to prevent the species from declining irreversibly in the foreseeable future.

2 - An action that must be taken to prevent a significant decline in species population/habitat quality or some other significant negative impact short or extinction.

3 - All other actions necessary to provide full recovery of the species.

IMPLEMENTATION SCHEDULE

| General Category | Plan Task | Task Number | Priority | Task Duration | Region | Division | Other | FY 1 | FY 2 | FY 3 | Comments/ Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| R1 | Determine population parameters | 1 | 1 | 3 yrs. | 4 | FWE | ADCNR | See note | - | - | Tasks 1 and 2 will require $17,000 per year for 3 years. Task 1 will require a resurvey of all parameters at 3-year intervals. |
| R3,R6, R7,R8 | Study ecology | 2 | 1 | 3 yrs. | 4 | FWE | ADCNR | See note | - | - | |
| O1 | Guidelines for conservation | 3.1 | 2 | 1 yr. | 4 | FWE | ADCNR | - | - | - | No cost, guidelines to be developed after completion of Tasks 1 and 2. |
| M4 | Reduce depredation and disturbance | 3.2 | 2 | contin-uous | 4 | FWE | USDA (ADC) ADCNR | - | - | - | A plan presenting alternatives and costs to be developed by USDA (ADC). |
| A3,A6 | Obtain authority to manage habitats | 3.3 | 2 | 2 yrs. | 4 | RE | TNC CLT | - | - | - | Acquisition costs undetermined. |
| O2 | Protect through law enforcement | 3.4 | 2 | contin-uous | 4 | LE | ADCNR | $5600 | $5600 | $5600 | Funding to ADCNR for patrols (one per week, April 1 to October 15) through a Cooperative Agreement. |
| M3,O3 | Prohibit snagging and dredging in important basking areas. | 3.5 | 2 | contin-uous | 4 | FWE | MDCE | - | - | - | |
| M3,O1, O3 | Protect aquatic vegetation important to the turtle | 3.6 | 3 | contin-uous | 4 | FWE | MDCE ADCNR | - | - | - | This effort should be initiated as soon as information becomes available from Task 2. |

| General Category | Plan Task | Task Number | Priority | Task Duration | Region | Division | Other | FY 1 | FY 2 | FY 3 | Comments/ Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | Prepare conservation poster | 4.1 | 3 | 1 yr. | 4 | FWE | ADCNR | $5500 | | | Costs will cover layout and printing of 2000 posters. Costs do not cover staff time. |
| 01 | Provide news releases, popular articles, and educational talks | 4.2 | 3 | 3 yrs. | 4 | FWE | ADCNR | - | - | - | |
| 01 | Scientific publication | 4.3 | 3 | 1 yr. | 4 | FWE | Re-searchers | - | - | - | Journal article to be condensed for Endangered Species Technical Bulletin. |



List of Abbreviations

| | |
|---|---|
| ADCNR | Alabama Department of Conservation and Natural Resources |
| CLT | Coastal Land Trust |
| FWE | Fish and Wildlife Enhancement |
| LE | Law Enforcement, Fish and Wildlife Service |
| MOCE | Mobile District Corps of Engineers |
| RE | Realty, Fish and Wildlife Service |
| TNC | The Nature Conservancy |
| USDA (ADC) | U.S. Department of Agriculture (Animal Damage Control) |

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