

**HABITAT CONSERVATION PLAN TO ESTABLISH A CONSERVATION
BANK FOR THREATENED GOPHER TORTOISES
IN MOBILE COUNTY, ALABAMA**

Submitted by:

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Executive Summary

The Board of Water and Sewer Commissioners of the City of Mobile (hereinafter “the Board”) has applied to the US Fish and Wildlife Service for an incidental take permit under section 10(a)(1)(B) of the Endangered Species Act in order to establish a conservation bank on land owned by the Board to benefit the federally threatened gopher tortoise (*Gopherus polyphemus*). This plan would allow the take of occupied gopher tortoise habitat on private lands in Mobile County. Prior to such take, private landowners would pay a mitigation fee to the Board in exchange for restoration, management and protection of habitat on a 222-acre tract owned by the Board. In addition, affected tortoises on lands where take will occur will be translocated to the site of the conservation bank. Given that tortoises in much of Mobile County are threatened by habitat loss, degradation, and fragmentation, this plan is intended to result in a net benefit to the tortoise, thereby contributing to the recovery of the species.

Background

In 1987, the gopher tortoise was listed as a threatened species in the western portion of its range, from western Alabama to southeastern Louisiana. The tortoise is closely associated with the longleaf pine ecosystem, a biologically diverse, uniquely southern forest type that has declined by more than 95%. Reasons for the tortoise’s decline include habitat loss, fire suppression, habitat fragmentation, human predation, and declining densities of remaining populations. In Mobile County, development and fragmentation of tortoise habitat are a significant threat. This HCP provides a mechanism to address these threats to the tortoise, to provide private landowners in Mobile County with viable gopher tortoise mitigation alternatives, and to provide the Board with a financial incentive to manage its lands for the benefit of this species.

The Endangered Species Act regulates the destruction of occupied endangered species habitat on private lands. Private landowners can take occupied habitat only if they are covered by a permit allowing such take. Such a permit requires the private landowner to “mitigate and minimize” the impacts of the take to the “maximum extent practicable.”

Under this HCP, the Board is applying for a 10(a)(1)(B) permit from the US Fish and Wildlife Service. The Board would then have the ability to extend incidental take authority through a Certificate of Inclusion to private landowners in Mobile County who have tortoises on their property. Those landowners would purchase mitigation credit(s) from the Board and, after allowing for the relocation of affected tortoises, would have authorization to develop their property.

Description of the Conservation Bank Site

The 222-acre conservation bank site occurs on lands (over 7,000 acres in total) owned by the Board that are permanently protected from development and that surround Big Creek Lake in western Mobile County. A significant proportion of the site contains mature

longleaf pine forest on well-drained, sandy soils. The site is in need of management activities that restore more open, longleaf-pine canopy conditions, reduce hardwood encroachment, reduce invasive exotic species, and restore more natural fire regimes. In addition, the resident tortoise population is significantly depleted, thus requiring translocation of tortoises to the site in order to establish a viable population. Should conservation banking prove to be a viable strategy for the Board and conservation of the tortoise, the Board is open to considering devoting more acreage to serve as a gopher tortoise conservation bank.

Biological Goals and Mitigation Requirements

The biological goal of this plan is to create a viable, self-sustaining population of gopher tortoises on the conservation bank. This is to be accomplished through protection and management of the site over a 100 year period, restoration of the longleaf pine ecosystem, augmentation of the resident tortoise population with translocated tortoises, monitoring and adaptive management.

Under the plan, the Board will sell mitigation credits to private landowners seeking incidental take of occupied gopher tortoise habitat in the County. Note that this plan does not obligate the Board to sell mitigation credits. Instead, this plan allows the Board to do so if the private landowner pays a mutually agreeable mitigation fee to the Board and allows for the relocation of the affected tortoises. For each tortoise taken, private landowners will be required to cover costs associated with protecting, managing, and monitoring 1.5 acres of habitat at the conservation bank. In addition, tortoises will be translocated from the habitat where take will occur to the bank.

This plan contains a fairly extensive gopher tortoise monitoring program to be overseen by a Scientific Advisory Panel. The program includes radio-telemetry of tortoises, determination of population trends and reproduction at the bank, and testing for Upper Respiratory Tract Disease.

This HCP will not be viable unless it is economically feasible for private landowners in Mobile County and the Board of Commissioners. Given the expense associated with the requirements of this plan, the Board and the Service expect that for at least some landowners the cost of mitigation credits will be prohibitive (since the Board is unlikely to sell mitigation credits at a loss), unless outside funding can be secured to partially underwrite the costs of mitigation credits. Therefore, the Service and the Board will seek additional funding to implement this plan.

Finally, this plan is necessarily limited in scope. Given the limited size of the conservation bank and this HCP's mitigation requirements per tortoise taken, the ITP is limited to take of 128 tortoises in Mobile County. It is the hope of the Board and the Service that this HCP can provide increased knowledge on the biological and economic viability of conservation banking for gopher tortoises.

HABITAT CONSERVATION PLAN TO ESTABLISH A CONSERVATION BANK FOR THREATENED GOPHER TORTOISES IN MOBILE COUNTY, ALABAMA

Background

The gopher tortoise and the longleaf pine ecosystem

In 1987, the gopher tortoise (*Gopherus polyphemus*) was listed as a threatened species in the western part of its range, from the Tombigbee and Mobile Rivers in Alabama west to southeastern Louisiana. The gopher tortoise is the only tortoise indigenous to the southeastern United States, and its range extends from southeastern South Carolina south through much of Florida and west to southeastern Louisiana. The tortoise is dark-brown to grayish-black with large hind feet, shovel-like front feet, and a yellowish, hingeless undershell. It lives for as long as 40-60 years and perhaps longer. The tortoise spends a significant proportion of its life in its burrow.

Reasons for the tortoise's listing under the Endangered Species Act (ESA) include habitat loss, habitat fragmentation, human predation, and declining density in remaining populations (Diemer 1986; Lohofener and Lohmeier 1984). The species is closely associated with the longleaf pine (*Pinus palustris*) ecosystem. As noted in the US Fish and Wildlife Service's Gopher Tortoise Recovery Plan (hereinafter referred to as the Recovery Plan), "the natural longleaf pine community and its associated biological diversity represent optimal forest habitat for the gopher tortoise" (U.S. Fish and Wildlife Service 1990).

The longleaf pine ecosystem once covered some 74-92 million acres of the southern coastal plain from southern Virginia south to central Florida and west to eastern Texas (Frost 1993). In Alabama, longleaf pine covered perhaps 8.5 million acres or about 25% of the state, including much of Mobile County. After two centuries of exploitation, including conversion to agriculture, unsustainable logging at the turn of the 20th century, production of naval stores and turpentine, fire suppression, and conversion to commercial pine plantations, longleaf pine currently covers less than 3 million acres across its entire range – much of which is highly degraded (Outcalt and Sheffield 1996). According to one noted scientist, "from the standpoint of area loss, even accounting for second growth, they [longleaf forests] have suffered more drastically than other more widely publicized forests, such as the tropical rain forest or North American temperate rain forests" (Simberloff 1993). In Alabama, longleaf pine covers over 500,000 acres, with Mobile County accounting for roughly 97,000 acres (Outcalt and Sheffield 1996).

The longleaf pine ecosystem is characterized by open-canopied stands of stately pines covering a carpet of grasses and other herbaceous vegetation. Longleaf pine is uniquely adapted to fire. Low-intensity fires ignited by lightning and Native Americans once

swept across the longleaf forest favoring the fire resistant pines and suppressing hardwood undergrowth. Today, natural fires are rare and, thus, conservation of the longleaf pine ecosystem requires land managers and landowners to utilize prescribed fires. In degraded stands, longleaf restoration and conservation may entail mechanical removal of hardwoods, chemical treatments, control of invasive exotic species, planting longleaf seedlings, and other activities.

Longleaf is one of the most biologically diverse temperate forest ecosystems in North America. Over 20 federally-listed endangered species inhabit longleaf pine including the red-cockaded woodpecker (*Picoides borealis*), the eastern indigo snake (*Drymarchon corais couperi*), several plant species, and the gopher tortoise. The gopher tortoise in particular is a keystone species in the ecosystem (Guyer and Bailey 1993). Jackson and Mistrey (1989) reported 362 species using gopher tortoise burrows, including the eastern indigo snake, the gopher frog (*Rana capito*), and other rare species. Diemer (1986) notes the gopher tortoise's importance as a seed dispersal agent for native understory plants in sandhill habitat types. In addition, burrow construction, particularly the creation of a sand pile at the entrance of the burrow, may contribute to high plant species richness in the longleaf pine ecosystem (Hermann 1993).

Though gopher tortoises will utilize open-canopied forests with overstories of loblolly, slash, and other pines, gopher tortoises are closely associated with natural longleaf pine forests. In fact, as noted in the Recovery Plan, the entire western gopher tortoise population (i.e. the listed population) is found within the original range of longleaf pine in Alabama, Louisiana, and Mississippi (US Fish and Wildlife Service 1990). Longleaf often occurs on well-drained, sandy soils that allow for easy burrowing. Tortoises prefer these upland, droughty sites where longleaf is typically found. In addition, the open-canopy conditions that are typical of longleaf forests produce both the herbaceous vegetation that the tortoise consumes and the necessary conditions for egg incubation (U.S. Fish and Wildlife Service 1990). Lack of fire allows hardwoods and other vegetation to invade the site, thereby reducing its viability for gopher tortoises.

Importantly, nearly three quarters of what remains of the longleaf pine ecosystem is found on non-federal lands (Outcalt and Sheffield 1996). Nothing in the ESA requires any non-federal landowner to proactively manage longleaf pine using prescribed fire, selective thinning, or other management tools so as to maintain and enhance the habitat of the threatened gopher tortoise or any other listed species (Wilcove et al. 1998). The ESA simply prohibits such landowners from taking endangered species by destroying habitat in such a way that harms the tortoise; it does not protect tortoises from benign neglect which is very common on private lands. For this and other reasons, there is a growing consensus that longleaf pine conservation will require the creation of financial and other incentives to encourage the protection and restoration of this important forest type on private lands for the benefit of the gopher tortoise and other species (Landers et al. 1995).

This habitat conservation plan creates a financial incentive for the protection and management for a 100-year period of a gopher tortoise reserve on land owned and managed by the Board of Water and Sewer Commissioners of the City of Mobile, Alabama (hereinafter referred to as the Board of Commissioners). While this plan involves take of existing gopher tortoise habitat, the mitigation activities required in the plan will improve the viability of gopher tortoises in Mobile County thereby contributing to the recovery of the species there.

The Status of the Gopher Tortoise in Mobile County

There is incomplete data on the status of the western population of the gopher tortoise on private lands throughout its range. As with any species with a significant proportion of privately owned habitat, undertaking a comprehensive survey for the tortoise is compromised by the fact that surveyors do not have access to all private lands. Many landowners are wary of permitting surveyors onto their land to search for endangered species. In addition, were access to private lands available, from a practical standpoint, given the sheer magnitude of the tortoise's former range, undertaking such a comprehensive survey would be very expensive and time-consuming.

In 1991, a survey of both publicly and privately owned gopher tortoise habitat was conducted in Mobile County (Nelson et al. 1992). While no such survey could cover the entire range of the tortoise in Mobile County, this survey does provide a useful examination of the status of the species in the County. The authors of that study state:

During 28 days in the field, we sampled a total of 392 burrows in 32 townships and drove a total of 2,642 miles; 173 burrows were encountered on a total of 67 transects. Preliminary data analysis indicated declining populations; tortoises have been extirpated from urban areas. Although populations continue to decline in the southern parts of the county, they appear to be comparatively more stable in elevated areas of north Mobile County, where the habitat has been less severely disturbed (Nelson et al. 1992).

The above study, data regarding the loss of longleaf pine in Alabama and Mobile County (Outcalt and Sheffield 1996), and anecdotal evidence of increasing development and habitat degradation in Mobile County suggest that gopher tortoises are subject to continuing threats in Mobile County.

The Endangered Species Act

Section 9 of the ESA prohibits private landowners (and others) from "taking" a federally listed endangered wildlife species. This take prohibition has been interpreted broadly to include a range of activities that could directly kill or harm an endangered species, including destroying occupied habitat. This prohibition, however, is not absolute. In 1982, the ESA was amended to allow non-federal landowners to apply for an "incidental take permit" (ITP) under Section 10(a)(1)(B) of the Act in exchange for agreeing to a

“habitat conservation plan” (HCP) that mitigates and minimizes the impact of the take to the maximum extent practicable. (“Incidental take” of endangered species is defined as take that occurs in the course of otherwise legal activities where species are harmed incidentally to such activities.) Thus, private landowners in Mobile County who plan to undertake activities, such as housing development, within occupied habitat that will take gopher tortoise habitat, must seek coverage under Section 10 of the Act (in limited cases, landowners may be able to receive take authorization from the US Fish and Wildlife Service through Section 7 – though that is not applicable here).

In this instance, the Board of Commissioners seeks such an ITP under Section 10 of the ESA. This permit would provide the Board with the ability to provide take authorization, with Service review, through issuance of Certificates of Inclusion to private landowners in Mobile County who minimize and mitigate such take by funding conservation activities on a 222-acre tract of land owned by the Board of Commissioners and by allowing for the relocation of tortoises to that site, as described this document. The ITP would also provide take authorization to the Board for conservation, restoration, and management activities at the conservation bank.

Purpose and Need

The gopher tortoise currently occupies habitat in portions of Mobile County that are under increasing pressure from residential and commercial development. Some new development has been halted where active (and therefore occupied) tortoise burrows occur because construction of houses or other buildings would result in take of gopher tortoises.¹ Developers and private landowners seek permission to take occupied tortoise habitat.

Even in the absence of new development or other direct take of gopher tortoise habitat, gopher tortoises are highly threatened throughout Mobile County due to the continuing degradation of the longleaf pine ecosystem as a result of lack of fire, past and on-going development, increased predation on tortoise adults, young and eggs from native and non-native predators (particularly fire ants and dogs), and spread of other invasive, exotic species. In addition, fragmentation of longleaf habitat by urbanization, roads, and other factors threatens the ability of tortoises to interbreed, disperse, and, ultimately, to survive over long time horizons. For example, tortoise mortality on roads in the range of the federally listed western population of gopher tortoises was estimated to exceed annual recruitment (Lohofner and Lohmeier, 1984). If the Service were to deny incidental take of gopher tortoises to private landowners in Mobile County, much of the gopher tortoise

¹ Gopher tortoise burrows are considered “active” if there are obvious tortoise tracks or shell scraping signs at the burrow mouth; “inactive” if there are no tracks or shell scrapings, the burrow is unoccluded by debris, but recent use is apparent, and; “old” or “abandoned” if the burrow is covered with sticks, weeds, grass or the burrow is collapsed or dilapidated (Cox *et al.* 1987).

population and the ecosystem it occupies would likely eventually be lost to benign neglect.

HCPs can be designed to provide landowners with the flexibility they need while also advancing the recovery of endangered species and restoring the ecosystems upon which those species depend. In this case, one approach would be to have developers and individual landowners develop individual HCPs and apply for ITPs from the Service on a case by case basis. There are several practical and biological problems with such a piecemeal approach. Most developers and landowners do not have the expertise to design and draft HCPs for the gopher tortoise. Consequently, the costs and delay associated with having landowners undertake individual HCPs are prohibitive. Further, the Service would prefer not to have to process multiple HCPs due, again, to the costs and delay of doing so.

From a biological standpoint, a piecemeal approach is not in the best interest of the gopher tortoise. For example, individual HCPs would likely lead to many, small mitigation sites where tortoises would continue to be vulnerable to habitat fragmentation, inbreeding, invasive species, and other factors. Such small sites are also difficult to burn, making perpetuation of the longleaf pine ecosystem and, thus, the tortoise, difficult. A coordinated strategy, on the other hand, that restores and protects gopher tortoise habitat in such a way so that those tortoises have a large, protected, and managed mitigation site should substantially improve prospects for the tortoise to survive and prosper in Mobile County. Such a coordinated approach offers the best opportunity to contribute to the recovery of the gopher tortoise.

It is important to note that no private landowner with occupied gopher tortoise habitat on his or her land in Mobile County is required to participate in this program. However, this plan provides an opportunity for private landowners who seek to take gopher tortoises to be covered under an ITP without having to apply for an individual ITP – though that option still remains open to those landowners.

Through the establishment of a gopher tortoise conservation bank, this HCP will address the legitimate need of private landowners for incidental take of tortoise habitat while providing the Board of Commissioners with a financial incentive to conserve, restore and manage gopher tortoise habitat. As such, this plan will benefit conservation of the tortoise and the longleaf pine ecosystem in Mobile County.

Biological Goals of this HCP

Service policy requires that HCPs provide clear biological goals and that monitoring plans be developed to measure progress towards those goals. The over-arching goal of this plan is to create a self-sustaining, viable gopher tortoise population on land owned by the Board of Commissioners in west Mobile County that surrounds the Big Creek Lake Reservoir. Four indicators will be examined to measure progress towards this goal: (1) number of tortoises present at the site; (2) evidence of successful reproduction; (3)

translocation success, and; (4) habitat restoration success. As for the first indicator, Cox (1989) suggests a population of at least 40 tortoises in suitable habitat is viable for over 100 years. So, at a minimum, this plan will seek to establish such a population at the conservation bank. As for the second indicator, reproductive success will be monitored to ascertain evidence of breeding (egg fragments on burrow aprons) and recruitment (presence of juvenile burrows). The third indicator, translocation success, will be monitored through radio-telemetry. Emigration rates for resident and translocated tortoises will be compared and reviewed by the Scientific Advisory Panel as will translocation success. Habitat restoration, the fourth indicator, will be monitored by examining herbaceous ground-cover, canopy cover, and pine basal area.

The biological goal will be accomplished through (1) protection and management of a tract of longleaf pine that will serve as a conservation bank for 100 years; (2) conservation and restoration of longleaf pine and gopher tortoise habitat on that tract; (3) augmentation of the resident gopher tortoise population with translocated tortoises, and; (4) monitoring and associated adaptive management of gopher tortoises and restoration of their habitat at the conservation bank.

A secondary goal for this HCP is to examine whether the approach it uses, conservation banking, is an appropriate one to be applied more broadly across the range of the gopher tortoise. If establishment of a conservation bank on the initial 222-acre parcel owned by the Board of Commissioners, as contemplated here, is successful in achieving the biological goals of this HCP, then the Board may be willing to include additional portions of its 7,000 acre ownership as mitigation for loss of gopher tortoise habitat. Doing so, however, would require formal approval by the Service, including opportunity for public comment. In addition, if this plan is successful, other private landowners may also be interested in establishing conservation banks for the benefit of gopher tortoises.

Establishment of a Conservation Bank

In order to fulfill the biological goal of creating a self-sustaining gopher tortoise population, this HCP establishes a gopher tortoise conservation bank that will serve as a mitigation site for losses of occupied tortoise habitat that occur on lands in Mobile County. The ITP granted to the Board of Commissioners pursuant to this Section 10(a)(1)(B) application and HCP would allow the Board to extend incidental take authorization to private landowners in Mobile County through a Certificate of Inclusion. The Certificate of Inclusion (Appendix A) will state the landowner's name(s), the location of the property, and the number of tortoises to be translocated from the property. The Certificate will be signed by a representative of the Board and the Service and will be presented to the landowner when his/her obligations under this HCP have been satisfied.

Conservation banking is not a new idea for gopher tortoises (Diemer 1989). Though conservation banking has yet to be implemented in a coordinated way on private lands for the federally listed tortoises of the western population, translocation of gopher tortoises to

new sites has been a relatively common practice in Florida. In Florida, gopher tortoises are protected by a state law that requires mitigation by developers who build on sites where gopher tortoises are present.

Diemer (1986) has suggested that conservation banking could be a useful strategy to protect important gopher tortoise habitats: “As mitigation for the destruction of tortoise habitat, developers could be required to contribute funds for the purchase of tortoise preserves.” Though this HCP technically will not result in the purchase of habitat for tortoises, the result is the same as this plan does result in the restoration, protection, and 100-years of management of a gopher tortoise population.

However, Diemer (1989) also notes that the scientific community has raised concerns about tortoise relocation, including importance of habitat suitability of the recipient site, dispersal of translocated tortoises, mixing of locally adapted gene pools, transmission of disease, disruption of resident populations, and other concerns. Scientists have also raised concerns that Florida’s recipient sites have, in some cases, become tortoise “dumping grounds” rather than conservation sites. This plan is designed to address these concerns. Given that on-site mitigation is often not a viable solution for the conservation of the gopher tortoise, this plan seeks to create a model that allows take of tortoise habitat in exchange for mitigation that more than compensates for the loss.

Under this HCP, landowners in Mobile County who desire to incidentally take tortoise habitat will contact the Board of Commissioners or the Service to request a Certificate of Inclusion. Those Certificates will authorize modification or destruction of occupied gopher tortoise habitat in Mobile County. The Service will have the opportunity to review and object to the issuance of any Certificate of Inclusion. In order to receive a Certificate of Inclusion, the private landowner will be required to pay a mitigation fee to the Board that will cover costs associated with gopher tortoise relocation, habitat restoration and management, and other activities at the conservation bank (more detail is provided below). The landowner will be required to provide access to his or her property and to allow sufficient time (60 days) to the Service or its designee to relocate all affected tortoises from the property to the conservation bank. (The individuals who will relocate tortoises will be required to possess or obtain the appropriate permits from the Service.) Relocation of affected gopher tortoises will minimize the impacts of incidental take while providing tortoises to augment mitigation activities at the conservation bank.

Once the tortoises have been relocated and the mitigation has been funded at the conservation bank, the private landowner will be freed from any endangered species obligations associated with the presence of gopher tortoise habitat on the property, consistent with the Service’s “No Surprises” policy. The ITP and Certificate of Inclusion will not authorize the incidental take of any other species listed under the ESA.

Description of bank site

Big Creek Lake was constructed in 1951 as the primary drinking water supply for the City of Mobile. The surface area of Big Creek Lake covers approximately 3,600 acres. In addition to the inundated acreage, the Board holds title to approximately 6,000 fee simple acres and owns the land (excluding the timber rights) under an additional 1,300 acres. Ownership of the timber on these lands automatically reverts to the Board in 2011. All of this acreage is used as a buffer zone for the protection of the water quality of Big Creek Lake.

The majority of the timbered acreage held by the Board is comprised of older growth (65-75 years) longleaf pine. This timber is managed under the direction of a long term forest management plan, which includes harvest, regeneration, and various silvicultural practices. It is the stated objective of the Board to maintain the undeveloped nature of this acreage in perpetuity. In addition, the Board has undertaken an aggressive land acquisition program to further increase the depth of the buffer and to protect the primary tributaries which feed Big Creek Lake.

The Board is interested in the possibility of devoting a larger proportion of its land to gopher tortoise conservation through conservation banking. However, both the Board and the Service would like to examine this approach on a limited amount of acreage before committing to it on a larger scale. Thus, this plan develops a conservation bank on a relatively small portion of the Board's ownership.

The gopher tortoise conservation bank site is known as Management Block 25 in the Board's Forest Management Plan. This site encompasses approximately 222 acres and is located along a portion of the east boundary of Big Creek Lake (see figures 1 & 2). The inundated portion of Big Creek Lake encompasses a large percentage of the hardwood drains and lower upland sites. As a result, approximately seventeen (17) of the 222 acres included in this reserve are hydric, hardwood creek bottoms. The upland longleaf pine sites begin at the water's edge.

The Soil Survey of Mobile County, Alabama, prepared by the US Department of Agriculture, identifies three soil types on the Reserve site. These soils are (1) Benndale sandy loam (2-5% slope), (2) Troup loamy sand (0-5% slope), and (3) Troup-Heidel complex (8-12% slope). The following is a description of the soils found on the 222 acre site:

BENNDALE SANDY LOAM (2-5% slope) - These are well drained, gently sloping soils on ridgetops and side slopes of the Coastal Plain uplands. Typically, the surface layer is dark, gray sandy loam about 5 inches thick. The subsurface layer is light yellowish brown sandy loam to a depth of 11 inches. The upper part of the subsoil, to 40 inches, is yellowish brown loam, and the lower part, to 72 inches, is yellowish brown clay loam that has mottles in shades of yellow, brown, and red. Permeability and available water capacity are moderate.

TROUP LOAMY SAND (0-5% slope) – These are well drained, gently sloping soils on ridgetops of Coastal Plain uplands. Typically, the surface layer is dark grayish

brown loamy sand about 4 inches thick. The subsurface layer is yellowish brown loamy sand to a depth of 15 inches, brownish yellow loamy sand to 44 inches, and reddish yellow loam to 69 inches. The subsoil is red sandy loam to 86 inches. Permeability is rapid in the sandy layers and moderate in the subsoil.

TROUP-HEIDEL COMPLEX (8-12% slope) - These soils consist of well drained Troup and Heidelberg soils that are mostly in long and narrow bands that are adjacent to streams and drainage-ways in the Coastal Plain uplands. Troup loamy sand comprises 50 percent of the map unit. Typically, the surface layer is dark grayish brown loamy sand about 4 inches thick. The subsurface layer is yellowish brown loamy sand to a depth of 15 inches; brownish yellow loamy sand to 44 inches; and reddish yellow loamy sand to 69 inches. The subsoil is red sandy loam to 86 inches. Permeability is rapid in the sandy layers and moderate in the subsoil of the Troup soil. Heidelberg sandy loam comprises approximately 19 percent of the complex. Permeability and available water capacity are moderate in the Heidelberg soil. Based upon sand depth and rapidity of drainage, the Troup-Heidelberg complex provides the best soils for tortoises on the site.

The majority of the conservation bank is composed of predominately mature longleaf pine timber of the 65-75 year age class. The current timber stand was heavily thinned in 1997 and currently carries a basal area of 40-70 square feet in the older stands. A portion of the tract is comprised of advanced longleaf regeneration, which is rapidly approaching merchantability. The advanced regeneration occupies approximately 50 acres of the subject site.

The timber resource located on the Board's acreage generates needed revenue for forest management activities and land acquisition opportunities. The Reserve acreage will continue to generate timber income as stand conditions dictate. Thinnings, coupled with overstory removals in regenerated areas will help provide herbaceous ground cover for gopher tortoise colonies.

There are two small upland areas which contain clumps of hardwood, mast-producing trees. These patches will be maintained for deer, turkeys, gray and fox squirrels. The two patches occupy a total of two acres.

Controlled burning has greatly reduced the undesirable understory and midstory in many areas. Continual burning, on a shorter interval will eventually reduce the brush throughout the entire upland site. Due to the proximity of the Reserve site to residential developments and the Mobile- Regional Airport, burning can be conducted during limited times of the year. Advanced planning and preparation are the keys to utilizing prescribed fire.

The rapid spread of cogongrass (*Iniperata cylindrica*) in the southeastern United States has made forest management very difficult in many areas. Control is expensive and time consuming. The Reserve site contains stands of cogongrass. The Board has undertaken an aggressive campaign to reduce the detrimental effects of this noxious pest. Herbicide

applications have been made in the spring and fall of the year to arrest the spread of cogongrass. Obviously, this will be an ongoing process; however, the Board has already made significant progress in reducing the cogongrass on the conservation bank.

Baseline conditions at the conservation bank

In February, 2000, the site for the proposed conservation bank was surveyed for the presence of gopher tortoise burrows using transects placed at intervals across the tract. The area was subdivided into 8 different sections that were individually surveyed. Coordinates were recorded for most burrows using a handheld global positioning system unit. Each burrow was flagged and most burrows were tagged with a burrow number and date. Burrows were designated as active, inactive or old (see footnote 1). Since the survey was conducted during the cooler winter months when tortoises are far less active, some of the inactive burrows may well have been occupied by tortoises. The survey found 91 burrows of which 3 were active, 28 were inactive, and 60 were old.

In early March, 66 of the 91 burrows located during the previous survey were scoped (scoping entails inserting a camera into a tortoise burrow to ascertain whether the burrow is occupied). All active and inactive burrows were scoped and 35 of the 60 abandoned burrows were randomly selected for scoping. Tortoises were located in 8 burrows. Scoping was inconclusive in 6 burrows because turns or obstructions could not be navigated by the camera.

Mann (1993) suggests a correction factor of .414 to translate the number of active and inactive burrows at a site into the number of tortoises present. This would suggest a population of 13 tortoises at the conservation bank – 5 more tortoises than were found through scoping. However, to allow for tortoises or burrows that may have been missed during surveys, the baseline population is estimated to be 15 tortoises. Given the results of the survey work at the bank, this is a conservative figure that provides greater protection for tortoises at the bank and that reduces the number of credits available from the bank.

Incidental Taking to be Authorized

This HCP would authorize two types of incidental take associated with operation of the conservation bank. The first type will be incidental take associated with the destruction of gopher tortoise habitat on privately owned tracts of land in Mobile County. As noted previously, private landowners in Mobile County can receive authorization to take gopher tortoises on lands to be developed after first mitigating such take on the conservation bank and allowing for the relocation of gopher tortoises.

Under this HCP, the Board of Commissioners is making an initial 222-acre tract available as a conservation bank for habitat losses that occur in Mobile County. (As noted previously, the Board may decide to make more acreage available to private landowners seeking incidental take of gopher tortoise habitat if this plan is successfully achieving its

biological goals while also fulfilling the Board's land management objectives.) As mitigation credits are sold by the Board from the 222 acres, the Board will commit the required proportion of that tract into managed gopher tortoise habitat for 100-years until there are no more credits left to sell. (As explained later in this HCP, the take of each gopher tortoise requires the protection and management of 1.5 acres of habitat at the conservation bank. For example, if the Board issues Certificates of Inclusion for 50 tortoises, the Board will be required to set aside 75 acres into gopher tortoise management above the acreage already required by existing, baseline tortoises (1.2 acres per tortoise). As more Certificates of Inclusion are issued, more habitat will be set aside until the conservation bank is at capacity.) At the same time, the Board will commit to managing and restoring open longleaf pine conditions on the entire 222 acre tract, so that habitat will be improved for gopher tortoises prior to the sale of mitigation credits.

The second type of take authorized by this HCP would allow certain activities associated with management of the conservation bank itself. Conservation, restoration and management of the longleaf pine ecosystem at the conservation bank will require several activities that could potentially take gopher tortoises. While these activities will ultimately benefit the gopher tortoise and the longleaf pine ecosystem, it is possible that incidental take of individual gopher tortoises could occur as a result of these conservation, restoration, and management activities.

Restoration of longleaf pine at the conservation bank will require selective harvesting of hardwoods and longleaf pines in order to reduce hardwood encroachment and create open stand conditions. In addition, the Board of Commissioners will continue to manage the timber resource through natural regeneration and selection management, pursuant to the plan document below. Prior to all timber harvests or hardwood removal, foresters will flag known tortoise burrows so that equipment operators can avoid such sites. However, even with such precautions, it is possible that equipment operators could inadvertently run over a tortoise or a tortoise burrow.

Natural regeneration and planting of longleaf seedlings in areas where there is a significant hardwood component and control of exotic species such as cogongrass at the conservation bank may require use of chemical herbicides. All herbicides will be used in accordance with label instructions. Nonetheless, it is possible that the use of herbicides may temporarily damage gopher tortoise habitat. In the long run, tortoises will benefit from the use of herbicides where they are necessary to improve habitat. Other conservation, restoration, and management activities may also result in the incidental take of gopher tortoises. Therefore, under this HCP, the Board of Commissioners will be provided with an ITP for activities associated with the conservation, restoration, and management of the longleaf pine ecosystem.

Potential Impacts of Incidental Take

While this HCP is intended to benefit the gopher tortoise through the creation of a managed, self-sustaining, and viable population at the conservation bank, this HCP does

involve the take of gopher tortoises through destruction of occupied gopher tortoise habitat and relocation of gopher tortoises.

Prior to development of a property or any other activity that could result in incidental take, property owners who seek a Certificate of Inclusion under this plan will provide access to their property to the Board (or its designee) and the Service (or its designee) so that tortoises can be trapped and relocated to the conservation bank. In addition, upon paying their mitigation fee to the Board of Commissioners, landowners will be required to allow the Board (or its designee) or the Service (or its designee) 60 days to trap and relocate tortoises from the property prior to commencing development on the tract. Although unlikely, take incidental to translocation of affected tortoises could occur if an animal is killed or injured during excavation and handling. Reasonable precautions will be taken during translocation of tortoises to ensure that injury or deaths are minimized.

Relocation of tortoises could also result in the spread of URTDs. In order to prevent this, all translocated tortoises will be tested for URTDs prior to their release at the conservation bank. Another potential impact of tortoise relocations is the mixing of locally adapted gene pools. In response to this concern, this HCP authorizes relocation and take of gopher tortoises only within Mobile County. Further, the conservation bank is also located in the County.

Once tortoises are relocated to the conservation bank, a portion of the tortoises are likely to emigrate from the site. This is another potential impact of take that must be considered. In order to reduce the impacts of emigration, the Board will carry out (indeed has already carried out) habitat restoration activities in advance of the relocations (restoration activities will continue to occur after translocations). The availability of suitable habitat should reduce emigration from the site. Moreover, a conservative stocking density has been chosen (as explained in more detail later in this HCP) that should help reduce the chances of emigration from the site.

In addition to the potential impacts from the relocation of tortoises, implementation of this HCP will result in the loss of gopher tortoise habitat in portions of Mobile County where development is occurring. However, it is important to realize that much of the occupied tortoise habitat to be taken would eventually be lost in the absence of this plan. As noted previously, the longleaf pine ecosystem requires active management in the form of prescribed fire and other activities to regenerate pines, to control hardwoods and other invasive vegetation, and to sustain suitable herbaceous vegetation. In the absence of such management, longleaf pine sites are overtaken by hardwoods and other woody vegetation. Increasing hardwood encroachment causes less sunlight to reach the forest floor, thereby limiting available forage for gopher tortoises. Such habitat can no longer sustain gopher tortoises.

Urbanization around occupied tortoise habitat also increases the probability of gopher tortoise mortality due to predation by dogs, collisions with automobiles, and other factors. Urbanization and accompanying fragmentation of tortoise habitat interferes with

the ability of gopher tortoises to interact and interbreed with other gopher tortoises. This again suggests that the gopher tortoise will continue to decline in Mobile County due to both the direct and indirect effects of development.

In short, if nothing is done about the tortoise, it will continue to decline in Mobile County. Even if the county were to undertake strict land use controls and prevent development in occupied tortoise habitat, the fragmentation and habitat degradation caused by past development would be virtually impossible to reverse. If large blocks of occupied, suitable habitat currently exist on private lands in Mobile County, it may well be the case that they are not suitable for inclusion under this plan. For this reason, the Service reserves the right to review and object to the issuance of all Certificates of Inclusion. However, given the trends for gopher tortoises and longleaf pine habitat loss in the County, the expectation underlying this plan is that establishment of a gopher tortoise reserve provides the best and most practical solution to the threats faced by the tortoise in Mobile County.

The extent of incidental take allowed under this HCP is quite limited. In particular, take is limited by the size of the conservation bank (222 acres with 205 acres of suitable habitat). Given the size of the bank, the existing (albeit significantly depleted) population there, and the mitigation requirements per tortoise taken, the number of available credits to be offered by the Board is limited to 125 tortoises. The Service estimates that at most 3 tortoises will be harmed or killed at the bank as a result of mitigation activities. Thus, assuming all available credits are sold by the Board, estimated take for this HCP is 128 gopher tortoises.

This plan offers a coordinated strategy for conservation of the gopher tortoise on private lands in Mobile County. Though it will allow take of existing gopher tortoises, the mitigation activities to be undertaken at the bank should, at minimum, compensate for the loss of gopher tortoise habitat in Mobile County.

Measures to Minimize and Mitigate Negative Impacts of Incidental Take

Mitigation and minimization activities for take of gopher tortoises under this HCP will involve private landowners paying for the (1) protection and management of the conservation bank; (2) restoration of open-canopied longleaf pine habitat at the bank; (3) disease testing and relocation of gopher tortoises to the conservation bank to augment the existing, depleted population there, and; (4) monitoring of gopher tortoises at the bank.

Determination of mitigation requirements

Landowners who seek a Certificate of Inclusion under this HCP will have their properties surveyed for gopher tortoises. The number of tortoises present will determine the number of mitigation credits the landowner is required to purchase. Prior to development, those tortoises will be tested for upper respiratory tract disease (URTD). URTD is a disease caused by a bacterium, *Mycoplasma agassizii*, that can infect and kill gopher tortoises.

(URTD and testing for the disease are described more thoroughly in a subsequent section of this HCP.) If tortoises test negative for the disease, they will be relocated to the conservation bank. In addition, in order to be eligible for a Certificate of Inclusion, landowners will be assessed a mitigation fee per tortoise taken. This mitigation fee will cover the costs of minimization and mitigation activities at the conservation bank.

The Gopher Tortoise Recovery Plan suggests a gopher tortoise density of 1.2-2.8 tortoise burrows per acre for lands that would count toward recovery of the species. The Recovery Plan uses a correction factor of .61 to translate the number of burrows into number of tortoises (US Fish and Wildlife Service 1990). However, more recent data from the Desoto National Forest and the Marion County Wildlife Management Area in nearby Mississippi have been used to calculate a correction factor of .414 gopher tortoises per active and inactive burrow (Mann 1995). Using this correction factor, the Recovery Plan target density would then be .49 to 1.2 gopher tortoises per acre. The mid-range of this density figure is .8 tortoises per acre (1 tortoise per 1.2 acres).

The stocking rate used for augmentation in this HCP will be 80% of the target density figure (target density is 1 tortoise per 1.2 acres). Thus, tortoises that are relocated to the site will be stocked at a rate of one tortoise per 1.5 acres of currently unoccupied habitat.

The 80% stocking rate was chosen for the following reasons. First, this lower stocking value will allow for natural growth and reproduction of the population at the conservation bank. A 100% or greater stocking rate would not permit such natural growth and reproduction of the population. Second, too low a stocking rate might delay establishment of a larger population as some tortoises are expected to emigrate from the site. Third, the chosen stocking rate will, on average, protect more habitat than is being lost. Forth, emigration from the conservation bank is affected by the stocking density. A lower than 100% stocking rate will likely reduce emigration of tortoises from the conservation bank. Taking these considerations into account, the Service believes that this stocking rate is relatively conservative, meaning it is more likely to err in favor of the tortoise than not. For example, as cited in the Recovery Plan, McRae et al. (1981) found a mean home range for males of 1.16 acres and for females of .2 acres. These ranges typically overlap with the ranges of other tortoises. This HCP requires protection, management and monitoring of 1.5 acres per tortoise taken.

At the same time, the Board and the Service recognize that the 80% stocking figure may not be the optimal stocking rate. This may become apparent over time as data are collected on relocation success and other factors associated with conservation banking on the initial 222-acre tract owned by the Board of Commissioners. Demand for such credits is fairly high according to the Service; credits may be exhausted in as little as two years. With respect to this HCP, the stocking density will remain at 80%. It is, therefore, important to realize that the initial 222-acre site has a limited number of gopher tortoise mitigation credits available. Thus, if 80% proves not be optimal, its application will be limited.

If the Board of Commissioners seeks to expand the size of the conservation bank beyond the initial 222 acres, the results of this HCP's monitoring program will be used to re-evaluate this stocking rate. (As noted previously, expanding the bank beyond the initial 222-acre site will require formal review by the Service.) Thus, one of the goals of the monitoring program will be to assess the stocking rate used as part of this HCP. Moreover, the results of the monitoring program will also inform stocking rates for future conservation banking of gopher tortoises if this approach is adopted on other lands.

Restoration and Management Plan for the Conservation Bank

The Board will be responsible for all habitat restoration and management activities set forth in this conservation plan. Restoration and management activities will focus on restoring and maintaining suitable habitat conditions on the conservation bank.

Habitat Parameters. Suitable gopher tortoise habitat requires ample herbaceous ground cover, open canopy conditions, and relatively low basal area (timber density) in merchantable stands. These key habitat parameters will be influenced by tree stocking rates, prescribed fire, pre-commercial and commercial thinnings, and chemical control of hardwood vegetation where necessary. The habitat parameters will be dealt with as follows:

- 1) *Herbaceous ground cover.* Herbaceous ground cover is an important measure of habitat suitability for gopher tortoises. Areas with higher herbaceous ground cover will typically support greater numbers of tortoises (Cox *et al.* 1987). Active tortoise burrows at the Conecuh National Forest averaged 28% herbaceous ground cover (Aresco and Guyer 1999). For this plan, herbaceous ground cover of greater than 40% or higher is desired. This condition will be achieved and maintained primarily with prescribed fire, pre-commercial and commercial thinnings, and reduced stocking densities. The Board will make every reasonable effort to enhance herbaceous ground cover beneficial to gopher tortoises, and to control invasive species such as cogongrass. The Board will not plant herbaceous vegetation in order to achieve desired ground cover conditions as this is unnecessary.
- 2) *Canopy cover.* Maintenance of open stand conditions is vital to producing suitable herbaceous ground cover for gopher tortoises. Therefore, suitable canopy cover is a key management objective for the conservation bank. A total canopy cover of 60% or less will be maintained in all stands less than 45 years of age. Canopy cover may exceed 60% in older stands (45 years or older) where few sub-canopy trees and understory shrubs are present. Overstory canopy cover will be maintained with thinnings; while midstory canopy cover will be maintained through prescribed fire, thinnings, and, if necessary, herbicides.
- 3) *Basal area in young stands.* Basal area is a measure of timber density and therefore is closely related to canopy cover. Like canopy cover, basal area directly influences

herbaceous ground cover. The basal area in stands less than 25 years of age will be maintained at 60 square feet or less through thinnings or harvest. Gopher tortoise habitat in these stands will be enhanced as needed through control of mid- and understory shrubs, hardwoods, and other vegetation. Upon annual inspection of merchantable stands less than age 25 with a basal area greater than 60 square feet per acre, the Board forester will implement a harvest to meet or exceed the desired condition in the residual stand, once the stand reaches merchantable size. Pre-commercial thinning will be used in non-merchantable stands to maintain basal areas less than 60 square feet per acre.

- 4) *Basal area in older stands.* The basal area in stands greater than 25 years of age will be maintained at 70 square feet or less through thinnings or harvest. Gopher tortoise habitat in these stands will be enhanced as needed through control of mid- and understory shrubs, hardwoods, and other vegetation. Upon annual inspection of merchantable stands greater than 25 years of age with a basal area that exceeds 70 square feet per acre, the Board forester will implement a harvest to meet or exceed the desired condition in the residual stand.

Regeneration Activities. All site preparation activities will be conducted in such a manner as to protect gopher tortoise burrows. These burrows will be flagged or marked in such a manner as to be readily visible during all site preparation and regeneration activities. Site preparation techniques including prescribed fire and, if necessary, herbicides will be utilized, thereby reducing soil disturbance and compaction. Bedding, ground chiseling, and deep disking will be prohibited. Shallow disking for fire lane establishment and/or maintenance will be allowed; however, no burrows will be disked as fire lanes will be 25 feet from active burrows. Disking activity for any reason will be minimized during gopher tortoise reproductive periods from May 15 to September 30 (Landers et al. 1980). Broadcast application of soil residual herbicides will not be conducted during the spring months due to potential impacts on gopher tortoise herbaceous foods within the treated area. Use of soil residual herbicides will be limited to late summer application periods to avoid residual impacts on food plants during tortoise activity periods. A protective buffer strip radius of at least 25 feet will be maintained around all active and inactive burrows during all mechanical site preparation operations. Cogongrass spraying will be conducted within the 25 foot buffer only when needed.

Natural regeneration techniques will be utilized whenever possible. There may be some limited instances in which planting is required to establish longleaf pine. Prior to initiation of planting all known burrows (active, and inactive) will be identified and marked in such a manner as to be visible to tree planting crews. Machine planting will be prohibited within the 25 foot radius buffer of all burrows. While initial planting rates may be somewhat higher to allow for mortality, stocking density in planted areas one year after planting will be maintained at a maximum of 300 longleaf pines per acre.

Timber Harvest Activities. Prior to initiation of any mechanized harvesting activity within the conservation bank, all active and inactive gopher tortoise burrows will be flagged for ease of visibility. All logging equipment, roads, and log landings will be maintained at least 25 feet from active and inactive burrows. Merchantable timber may be removed from buffer areas.

Stand Management Activities. Habitat conditions at the conservation bank will be maintained through a variety of silvicultural activities. Use of prescribed fire will be the preferred option and used whenever possible. Based on the past experience of the Board's forester, a 2-year interval for fire in longleaf stands will be the desired management regime. Stands will be burned as early as possible when trees are of adequate size to withstand fire without excessive mortality or damage (typically, average longleaf stem diameter in the grass stage should exceed .5 inch). The decision to burn or not to burn rests entirely with the Board's forester based on his experience and the following conditions at the time of the burn: ambient air temperature, fuel load, fuel moisture, relative humidity, wind speed, wind direction, state/federal regulations, equipment status, and necessary state/federal permits.

For purposes of this HCP, prescribed fire is the preferred alternative for controlling midstory competition and promoting herbaceous vegetation. Prescribed burns will be implemented as needed for the reduction of midstory shrubs and hardwoods. Plowed firelanes will be located at least 25 feet from active tortoise burrows. Growing season burns will be used, whenever feasible. When growing season burns are not feasible due to weather conditions or liability considerations associated with "hot" fires, non-growing season burns will be conducted. In addition, due to weather conditions, liability concerns, or inability to secure the necessary permits, it is possible that during rare years, fire may not be an option. In those limited cases, if the forester deems hardwood or shrub encroachment to be a pressing management concern, selective herbicides may be used within the conservation bank site.

If colony sites exhibit canopy closure from shrubs and hardwoods, mechanical removal will be considered when fire has been unsuccessful in controlling larger shrubs and hardwoods. This management action will be evaluated in coordination with the Service prior to initiation. When mechanical removal of hardwoods and shrubs is undertaken, care will be taken to reduce soil disturbance so as to minimize the potential for invasion of cogongrass.

Water Quality. All silvicultural operations will be evaluated by the Board and the Board's forester prior to implementation. Any activity that is determined to potentially have a detrimental effect on the water quality in Big Creek Lake will be excluded. Alternate solutions or activities will be explored for accomplishing the stated objectives. However, generally speaking, management of longleaf pine for gopher tortoises is consistent with maintaining water quality in Big Creek Lake.

Invasive, Non-native Species. Cogongrass control is important to improve herbaceous vegetation for gopher tortoises. Fire is generally not effective in controlling cogongrass

while herbicides are quite effective. Herbicide treatments of cogongrass will be conducted during the spring and fall of the year.

Suppression of fire ants, also a non-native species, may be necessary to enhance the reproduction success of gopher tortoises since fire ants can kill hatchlings. Available approved chemicals will be analyzed for possible adverse effects to the water quality in Big Creek Lake. If approved for use at the conservation bank, fire ant suppression will be conducted according to label instructions.

Capture of Tortoises and Testing for URTD

At the sites where tortoises are to be taken, gopher tortoises will be captured either through trapping or, if necessary, excavation of tortoise burrows. Trapping is commonly used either to relocate gopher tortoises or to mark them for study. For tortoises that are difficult to capture through trapping, excavation may be necessary. This is typically done with a back hoe and, when nearing the end of the burrow, shovels. Flexible plastic tubing is inserted into the burrow to guide the excavation and to insure that the tortoise is unharmed. Trapping, excavation of tortoise burrows and relocation of tortoises to the conservation bank will be performed by the Service (or its designee).

When tortoises are being trapped at burrow entrances, when burrows are being excavated to extract tortoises, and when burrow entrances are being collapsed to prevent re-entry by tortoises, the burrow entrance will first be carefully examined for the presence of tortoise eggs in late spring and summer or for hatchlings in late summer and fall. Any eggs will be carefully removed, keeping the dorsal uppermost, and will be reburied at the same depth in the burrow apron at the release site. Hatchlings will also be relocated to the conservation bank.

Once tortoises are captured, they will be tested for URTD by the Service (or its designee), a potentially fatal disease. Despite substantial research, there is as yet no effective treatment for the disease nor a reliable method to stop its spread. It is a long-term disease which is often clinically silent and very difficult to diagnose (McLaughlin, 1997). Clinical signs of URTD include nasal discharge, ocular discharge, swollen eyelids, conjunctivitis, eyes recessed into the orbits, and dullness of the skin and scutes (Jacobson et. al., 1991; Schumacher et. al., 1993; Brown et. al., 1994; McLaughlin, 1997). In addition to this, there is a loss of weight, a shrinking down into the shell, and discoloration and crusty build-up around the eyes.

URTD is contagious and is transmitted by close contact (e.g. nose rubbing) between tortoises. However, transmission through water or on food cannot be ruled out. Exposure to URTD does not result in immunity (McLaughlin 1997). Gopher tortoises can get the disease multiple times and may become ill more quickly and more seriously than when initially exposed.

Little is known about the origins and history of URTD (McLaughlin, 1997). There are two prevailing schools of thought regarding URTD: one is that it is naturally occurring and flares up at times of anthropogenic or environmental stress, the other is that it could have been introduced by captive tortoises released into the wild (Berish, 1997). The issue of URTD is of significant concern relative to gopher tortoise relocation and restocking programs as movement of infected tortoises into previously uninfected sites is to be avoided whenever possible. Sero-positive gopher tortoises have been encountered in the states of Georgia, Florida, and Mississippi (Berish, 1997). Though there are no known cases of infected tortoises in Alabama, all tortoises to be translocated to the conservation bank will be tested for the disease.

Tortoises are tested for the disease by drawing approximately 0.25-1.00 ml of blood from the brachial vein in the tortoise's front leg. The sample is then transported to a veterinary lab and analyzed for the presence of antibodies to the bacterium using an enzyme-linked immunosorbent assay.

Eight gopher tortoises at the conservation bank were captured using Hav-A-Heart traps by the Service and tested for the disease in October and November, 1999. Serological samples were packed in styrofoam containers in ice and mailed via overnight express to the University of Florida Mycoplasma Research Lab in Gainesville, FL. All eight tortoises on the site were determined sero-negative, indicating that they had not developed antibodies in response to the pathogen, and, therefore, probably had not been exposed to the disease. Moreover, there were no clinical signs of URTD.

Tortoises captured from the sites where take will occur will be held in captivity until test results are returned from the lab. Holding tortoises in captivity will require construction of holding pens which will be overseen by the Service. Tortoises that are negative for the disease will then be released on the conservation bank.

A difficult question arises concerning the fate of diseased tortoises. Euthanasia is not considered by the Service to be warranted or in the best interest of tortoise conservation. Two other options exist: (1) re-release at the site to be taken; or (2) establishment of a reserve for diseased tortoises. Under this HCP, tortoises that are positive for the disease will be released at an isolated area, not on the conservation bank, set aside for sero-positive tortoises.

Translocation of Tortoises to the Conservation Bank

Translocation of affected tortoises to the conservation bank will help minimize the impacts of incidental take and help establish a viable population at the bank. Several studies of tortoise relocations have been conducted during the last 25 years (Diemer 1989). Translocated tortoises tend to wander from their release site in comparison to

resident tortoises. Some tortoises exhibit homing tendencies (McRae et al. 1981). Thus, relocation of gopher tortoises has met with mixed success. Landers (1981) released tortoises in southwestern Georgia and found that 41% of the released tortoises were present 3 years after relocation. Dietlein and Smith (1979) had a success rate of 80% after six months for tortoises that were penned or released into abandoned burrows. Stout et al. (1989) used radio-telemetry to track relocated gopher tortoises in central and southeast Florida. In two different efforts, they found 58% and 55% of the gopher tortoises remaining on site 1 year and 10 months, respectively, following relocation. Fucigna and Nickerson (1989) studied resident and translocated tortoises in Florida. The authors concluded that translocated tortoises remained within or nearby the relocation area and that the resident tortoises at the site were not seriously affected. Biologists at Camp Shelby, located on the DeSoto National Forest in Mississippi, translocated 14 tortoises into suitable habitat in October 1999. By March, 2000, 10 tortoises still remained. However, success of this translocation will be better judged in several months as the tortoises tend to move less during the winter months (D. Epperson, pers. comm.).

The above authors and others have made several recommendations about how to improve the success of gopher tortoise relocation efforts. The suitability and management of the recipient site is particularly important (Diemer 1989; Stout et al. 1989). The Board of Commissioners has already begun to improve habitat in anticipation of the launch of the conservation bank through hardwood removal, thinning of the overstory, use of prescribed fire, and control of cogongrass. In addition, under this plan, the Board will agree to manage the site for the benefit of gopher tortoises for the 100-year permit. The size of the release site is also important. Cox (1989) suggests a population of at least 40 tortoises in suitable habitat is viable for over 100 years. The initial 222-acre site can easily support that number of tortoises. Further, the initial release site is bordered on one side by water, including a large peninsula almost entirely surrounded by water. This water will serve as a barrier to emigration of tortoises from the release site.

In addition, the number of available burrows on the site is also important in lowering the number of tortoises that disperse from the site. (Stout et al. 1989). The site has many inactive and abandoned burrows as detailed in the baseline survey (as outlined earlier in this document).

Another important consideration in translocation is that the donor sites be relatively nearby the recipient site (Landers 1981). In this case, most of the development in Mobile County is occurring in the western portion of the county. The conservation bank is also located in west Mobile County. In any case, tortoises will not be translocated to the site from outside of the county. Diemer (1989) suggests not translocating tortoises during winter because of fear that a tortoise could be subject to hypothermia if it wanders from the recipient site. The Board will only allow translocation of tortoises from March 1 until September 15.

All gopher tortoise biologists note the importance of monitoring relocated gopher tortoises. While there have been several studies of gopher tortoise relocations, there is a

clear need for further research in order to improve relocation success. Not only is it important to monitor translocated tortoises but it is also important to monitor resident tortoises already at the site. Diemer (1989) and Berry (1986), in the case of desert tortoises, have noted that translocations can impact the resident population of tortoises. Monitoring is covered in the subsequent section of this HCP.

It is important to note that success of this HCP does not hinge solely on the success of gopher tortoise translocations to the conservation bank. Conservation, restoration and management of the longleaf pine ecosystem at the conservation bank is a central component of this HCP. That said, translocations will clearly augment the population there and, when successful, will significantly contribute to the goal of creating a self-sustaining population at the conservation bank. However, a sizeable proportion of the translocated tortoises may disperse from the site, and in very rare cases, some tortoises may not survive the trapping and relocation process. It is important to note that in the absence of this plan, the fate of tortoises in portions of Mobile County where take would occur is uncertain. A sizeable portion of these tortoises might also emigrate or be subject to other threats, such as habitat deterioration, which could result in mortality.

By restoring habitat at the conservation bank, the Board of Commissioners will improve conditions for the existing, depleted gopher tortoise population there, increase the likelihood of successful translocations, increase the probability that the tortoise population (both resident and translocated tortoises) on site will increase over time, and, more broadly, contribute to the conservation of the longleaf pine ecosystem.

Mitigation costs

The cost of mitigation credits to private landowners will be determined by the Board of Commissioners based upon the costs of operating the conservation bank. These costs include (1) habitat restoration costs; (2) trapping, relocating, and testing gopher tortoises; (3) continuing habitat management expenses; (4) gopher tortoise and habitat monitoring costs and other scientific oversight, and; (5) other management expenses associated with the tract.

This HCP will be a feasible alternative for private landowners in Mobile County who seek incidental take of gopher tortoises only if the mitigation costs they are to be assessed are not financially prohibitive. Both the Service and the Board expect that many private landowners who seek to utilize the conservation bank will be middle-income landowners. However, given the biological goals of this plan, the mitigation requirements, and the substantial monitoring program, costs of mitigation credits could be prohibitive for some landowners. At the same time, the Board cannot be expected to offer mitigation credits at a loss. Therefore, the Service and the Board recognize the need to secure outside funding to assist in underwriting the costs of this HCP. This will be explained in greater depth in a subsequent section of the plan.

Monitoring Plan and Adaptive Management

Service policy requires that HCPs include monitoring in order to gauge the permittee's compliance with the terms of the HCP and to examine the effectiveness of the HCP in meeting its biological goals. Monitoring is also important as a part of an adaptive management framework that alters the HCP as necessary in order to achieve the biological goals set out in the plan.

Scientific Advisory Panel

In order to oversee both the implementation and the results of the monitoring program, the HCP creates a Scientific Advisory Panel made up of 4-6 scientists to be chosen by the Board and the Service. Members of the advisory panel will be scientists who have extensive research knowledge of gopher tortoises, the longleaf pine ecosystem, and conservation biology. Service personnel responsible for oversight of this HCP will also attend meetings and conference calls of the Scientific Advisory Panel as *ex officio* members.

The purpose of the Scientific Advisory Panel will be to oversee implementation of the monitoring program outlined herein. In addition, the panel will review the results of the monitoring program and participate in the adaptive management framework described below. To perform these functions, the panel will meet at least once annually in person or by conference call. Minutes of these meetings and the recommendations of the Scientific Advisory Panel will be available to the public. The Advisory Panel will be in existence for the first ten years of the HCP, unless the Board or the Service anticipates a need to keep the panel functioning thereafter.

Monitoring

The Board and the Service will jointly undertake extensive monitoring of tortoises at the conservation bank in order to evaluate the progress of the plan in establishing a self-sustaining gopher tortoise population there. This monitoring program will not only inform management of the conservation bank, but it will also improve our knowledge of gopher tortoise translocations and the broader strategy of conservation banking itself. Tortoises will be monitored to determine the success of translocations, tortoise population trends on the site, reproductive success at the bank, and the presence of URTD in the population at the bank. The Board (or its designee) will write an annual summary report of the monitoring functions performed at the conservation bank, and of the data collected at the bank.

As noted previously, there have been studies of gopher tortoise translocation efforts elsewhere. However, there is clearly a need for additional data on translocation efforts. In order to monitor translocation success, all resident gopher tortoises (those currently present on the site) and 25 tortoises translocated to the site each year during the first two years of the conservation bank will be fitted with radio-telemetry devices. Using those devices, tortoises will be located daily for the first week following relocation, weekly

during the subsequent 4 weeks, and then twice during each of the following two years, including once during winter and once in the summer. For each tortoise, data will be collected regarding presence of the tortoise on the conservation bank and, if located, distance from the release site. This data will be analyzed to compare emigration from and movement within the conservation bank of both resident and translocated tortoises. The data will also be analyzed as to differing emigration and movement patterns for male and female tortoises. Monitoring of tortoises using radio-telemetry will be undertaken by the Service.

Every two years the Board (or its designee) will survey the conservation bank for active and inactive tortoise burrows. Such surveys will be conducted following prescribed burns as burrow detection is easiest at this time. These surveys will be used to establish population trends on the conservation bank. This will be undertaken until year 10 of the conservation bank's existence, and later if funding is available. Establishment of a self-sustaining gopher tortoise population requires successful reproduction. As Diemer and Moore (1994) note, "one criterion for evaluating the success of relocating tortoises is a population's post-relocation reproductive status." Therefore, as part of these surveys, special efforts will be made to locate juvenile tortoise burrows. Again, location of burrows is best accomplished following a prescribed fire due to the reduction in ground cover. In addition, as part of the burrow surveys, the aprons of adult gopher tortoise burrows will be checked for egg fragments. The location of juvenile burrows and egg fragments will be recorded.

The Board forester (or his designee) will annually measure pine and hardwood basal area, canopy cover, and herbaceous ground cover at the conservation bank. For purposes of these measurements, the conservation bank will be divided into stands of similar characteristics and habitat parameters will be measured on a stand-by-stand basis. In addition, the Board forester will annually estimate the number of acres impacted by cogongrass.

URTD is a continuing concern for conservation of the gopher tortoise. Biologists disagree on the threat posed by URTD. Some believe that URTD has to be monitored very closely while others believe the disease may not be a source of significant mortality. Nonetheless, this plan will test all tortoises translocated to the site for the disease. In addition, every two years, 10% of the tortoise population at the conservation bank will be tested for URTD by the Service until the Board of Commissioners has sold all of the available Certificates of Inclusion on the initial 222-acre portion of the bank. (Resident tortoises at the site have already been tested and no tortoises were found to possess the antibody for URTD.) If tortoises test sero-positive at the bank, the Board, the Scientific Advisory Panel and the Service will meet to determine a course of action which may include more intensive monitoring, closing the bank to further landowners, or other actions. A recommendation by the Scientific Advisory Panel and/or the Service to close the bank due to URTD will be binding on the Board.

All translocated tortoises will be marked prior to release at the conservation bank by drilling distinctive markings on the marginal scutes of the tortoises carapace.

If fire ant control is undertaken at the conservation bank, success of such control will be monitored if funding is available. Monitoring will consist of establishing two permanent transects through the property and sampling for fire ants twice annually.

In order for the Service to evaluate compliance with the terms of the HCP, the Board (or its designee) will prepare an annual report to the Service containing information on the incidental take authorized under the HCP during the preceding year, translocations, and restoration and management activities at the conservation bank. Specifically, the annual report will provide:

1. The geographic location of take authorized under the plan.
2. Brief descriptions of the habitat at the sites where take occurs.
3. The results of URTD testing for each tortoise.
4. The location of the release site for each relocated tortoise, sex of the tortoise, the date of release and the marking drilled on the marginal scutes of the tortoise's shell.
5. A description of restoration and management activities and approximate acreage subject to such activities, including timber harvests, prescribed fire (including season of burn), mechanical removal of hardwoods, and herbicide applications (including chemical and application method).
6. Listing of important habitat parameters, including canopy cover, basal area, and approximate acres affected by cogongrass.
7. Emigration data.
8. Population trends.

In addition, the Service will visit the conservation bank at least annually accompanied by the Board of Commissioner's forester to inspect the progress of the conservation activities at the bank.

Adaptive Management

According to the Service's Habitat Conservation Planning Handbook, "the primary reason for using adaptive management in HCPs is to allow for changes in the mitigation strategies that may be necessary to reach the long-term goals (or biological objectives) of the HCP, and to ensure the likelihood of survival and recovery of the species in the wild" (US Fish and Wildlife Service 1996). Adaptive management is primarily aimed at adjusting mitigation strategies when there is uncertainty as to how successful those strategies will be in attaining an HCP's biological goals. Adaptive management will apply to four specific areas of this HCP where there is uncertainty that needs to be addressed: (1) tortoise population trend, (2) translocation success; (3) recruitment, and; (4) habitat restoration.

Population Trend. The Scientific Advisory Panel will examine the tortoise population growth trend at the conservation bank to determine whether the population is rising at a satisfactory rate to meet the goal of establishing a viable population as defined by Cox (1989). If population estimates are low, the Panel will seek to determine the cause through examination of data related to translocation, emigration, recruitment, mortality, and habitat suitability.

Translocation Success. Key to establishing a viable population at the conservation bank is translocation success. The Scientific Advisory Panel will review emigration rates of resident and translocated tortoises. In addition, the Panel will review translocation success data. The Board and the Service expect 60% or higher of translocations to be successful. If translocation success falls below this figure, the Scientific Advisory Panel will make binding recommendations as to how to improve translocation success, including habitat restoration activities, translocation methods, and other strategies.

In addition, if the translocation success rate is especially low (as judged by the Panel), the Panel and the Service will determine whether the conservation bank should be closed to additional landowners. If this were to occur, then the Board would be responsible for maintaining suitable gopher tortoise habitat for the baseline population (1.2 acres per tortoise) and the number of mitigation credits sold (1.5 acres per credit sold) for the duration of the permit. In addition, the Board (or its designee) will be responsible for monitoring the habitat and the tortoise population for the duration of the permit.

Recruitment. With respect to recruitment, improved habitat management and tortoise relocations should result in increased recruitment in the population at the conservation bank. While reproductive success may be poor in some years due to a variety of factors, one would nonetheless expect to see increasing numbers of burrows in the 2-4 year-old size classes of gopher tortoises. Therefore, in year five of this HCP the Scientific Advisory Panel will examine recruitment success at the conservation bank. Should a recruitment deficit be evidenced at that time, a reassessment of management techniques and/or site suitability will be considered.

Habitat Parameters. The Board forester will monitor the relationship between stand basal area, canopy cover, and herbaceous ground cover. If the Scientific Advisory Panel determines that forest management is not producing sufficient herbaceous ground cover for gopher tortoises, then basal area and canopy cover targets used in this plan will be reduced so as to provide sufficient herbaceous ground cover.

The Board's forester has already begun a program to reduce cogongrass at the conservation bank. While the actions taken to date have proven relatively successful, this is an area that will require vigilance. Therefore, the Board forester (or his designee) will survey the site annually to estimate the acres of suitable habitat substantially impaired by cogongrass. This information will be reported to the Service and the Scientific Advisory Panel. If the area of cogongrass is increasing or relatively unchanged over time, then the

Scientific Advisory Panel, the Service and the Board forester will examine alternative means to control cogongrass.

Beyond the specific areas of adaptive management described above, this HCP offers an opportunity to examine and improve the strategy of conservation banking for gopher tortoises. As noted earlier, this HCP authorizes take of a limited number of tortoises based on the carrying capacity of the 222-acre reserve site. However, conservation banking is being contemplated by the Board on other portions of its ownership and by the Service throughout the range of the gopher tortoise. Therefore, as this HCP progresses and credits are sold, the Scientific Advisory Panel will also make recommendations to the Service as to the viability of the conservation banking approach, and ways to improve it.

In making such recommendations, the Scientific Advisory Panel will specifically examine the stocking density utilized in this HCP. While the mitigation requirements of this HCP are intended to err on the side of being overly protective of gopher tortoises, there is, as noted previously, some uncertainty as to stocking density employed in this HCP. In particular, if conservation banking is utilized for gopher tortoises in the future, then the initial stocking rate of 80% of the target tortoise density may need to be altered in future HCPs. Therefore, once two years of data have been collected from the conservation bank, during its annual meeting, the Scientific Advisory Panel will discuss and make recommendations to the Service concerning how the stocking density should be determined for future HCPs using conservation banking for gopher tortoises. The Panel will base its determination on the following data: (1) translocation success, (2) population trends at the conservation bank, (3) evidence of reproduction, (4) and other relevant recent gopher tortoise studies.

Alternatives to Establishment of a Conservation Bank

Three alternatives to the establishment of a conservation bank were considered, including (1) no action; (2) financial incentives to protect existing gopher tortoise habitat in Mobile County, and; (3) on-site mitigation.

No Action. Under the “no action” alternative, landowners would not be provided with incidental take authority to allow for the development of currently occupied habitat and the relocation of affected tortoises. For several reasons, this alternative does not meet the “Purpose and Need” outlined earlier in this HCP. First, private landowners and developers seek to develop areas occupied by gopher tortoises in Mobile County. Section 10 of the Endangered Species Act provides these landowners with the ability to address endangered species conflicts through an HCP. The “no action” alternative would deny or severely curtail development of many tracts in Mobile County. Many of these landowners have relatively significant investments in undeveloped lots.

Second, the longleaf pine ecosystem requires active management in the form of prescribed fire and, often, other hardwood control. In the absence of this plan, much of the occupied habitat in Mobile County that might enroll in this plan will be lost to benign

neglect as the canopy becomes too dense and pine stands are slowly captured by hardwoods. Relative to this HCP, this would very likely cause a net loss of occupied gopher tortoise habitat.

Third, the “no action” alternative does not address the problems associated with existing fragmentation of gopher tortoise habitat in Mobile County including high predation rates, mortality due to automobiles, and lack of recruitment. In addition, the “no action” alternative does not provide the Board with financial incentives to protect and restore longleaf pine habitat for the benefit of the gopher tortoise.

Financial Incentives. A second alternative is to offer financial incentives to private landowners in Mobile County to protect existing, occupied gopher tortoise habitat. This would be a useful approach for those landowners with sizeable tracts of fire-maintained longleaf pine that contain occupied habitat or habitat that is readily restorable. (For this reason in part, the Service maintains the ability to deny Certificates of Inclusion under this HCP when the agency deems that large tracts of occupied, suitable gopher tortoise habitat in Mobile County can and should be addressed through other, more appropriate means.) The Service has some funding available through its Private Lands Incentives Fund and Partners for Wildlife that could be directed to this purpose. This HCP does not preclude using incentives to protect valuable habitat for gopher tortoises in Mobile. However, since these incentive programs have relatively few dollars to spend, it would be unwise to use such funding to attempt to rehabilitate much of the highly degraded and fragmented habitat in Mobile County. Doing so would be quite expensive, and successful restoration, if obtainable, would take many years. Moreover, it would be impractical to undo existing habitat fragmentation in urbanizing areas of the county.

This HCP is targeted towards landowners with small tracts where incentives would likely not be well spent since the long-term viability on these tracts is far from certain. Moreover, a purely incentive-based approach does not address the concerns of landowners who do not wish to manage their small tracts for gopher tortoises. An approach which relies only on financial incentives does not meet the purpose and need of this HCP.

On-site Mitigation. A third alternative examined was to issue individual HCPs to landowners in Mobile County, requiring each to mitigate such take on the lot where take occurs. Such a strategy is flawed for two important reasons. First, many of the tracts where take is to occur are already too small to restore and maintain longleaf pine habitat. Indeed, fragmenting such tracts even further will worsen the plight of the tortoise. Second, given that much of the habitat in developing areas of Mobile County is highly degraded, keeping tortoises there indefinitely is a risky strategy because those tortoises are vulnerable to predation, automobiles and other threats.

On-site mitigation may be a viable alternative for large tracts of suitable habitat containing gopher tortoises. In part for this reason, the Service reserves the right to deny issuance of any Certificate of Inclusion under this HCP so that, where possible,

conservation of gopher tortoises on large tracts can be addressed through other means. However, for most landowners who are expected to seek Certificates of Inclusion from the Board pursuant to this HCP, on-site mitigation is not a useful conservation strategy and does not meet the purpose and need defined for this HCP.

Unforeseen Circumstances

The purpose of this plan is to provide biologically sound gopher tortoise mitigation opportunities for private landowners while improving the long-term viability of gopher tortoises in Mobile County. While it is the expectation of the Board of Commissioners and others involved in drafting this plan that it will provide a substantial benefit to the gopher tortoise, it is possible that unforeseen circumstances could compromise the ability of the conservation bank to meet the Board's objectives.

The conservation bank is approximately 25 miles inland from the Gulf of Mexico. Thus, it is possible that a hurricane could strike the mitigation bank and inflict severe damage on the longleaf pine forest there. The conservation bank will concentrate a portion of the gopher tortoise population in Mobile County on a single tract, making tortoises there vulnerable to a single severe hurricane. This might not be the case if these same tortoises were spread throughout Mobile County.

Two factors are likely to reduce the severity of a hurricane strike on the conservation bank. First, the forest at the conservation bank is primarily comprised of longleaf pine, a species that appears to be more resistant to hurricane force winds than other southern pines (Hooper and McAdie 1995). Second, management for gopher tortoises generally requires stands to be grown at reduced densities (e.g. maximum of 70 sq. ft. of basal area per acre). Trees grown in more open stand conditions tend to develop better root systems. This second factor may be confounded by the fact that open stand conditions can lead to greater mortality under severe wind conditions than more dense stands (Hooper and McAdie 1995).

Many of the effects of a hurricane can be dealt with through forest management activities targeted toward maintaining and restoring gopher tortoise habitat. Because gopher tortoises do not require old-growth forests and because they prefer low-density forests, the impacts of a hurricane are not irreversible or devastating to gopher tortoise conservation over the long-term.

Following a hurricane, the Board of Commissioners will attempt to salvage downed and severely damaged timber so as to maintain open stand conditions, reduce severe fire hazard, and create the soil and site characteristics necessary to regenerate longleaf pine and other native vegetation. A hurricane or other severe weather event will, therefore, require alteration of short-term management of the conservation bank, but it will not interfere with the long-term objective of protecting gopher tortoises, and conserving, restoring and managing the longleaf pine ecosystem at the bank.

Concentrating tortoises on a single tract may increase the likelihood that they will be impacted by a single severe storm. However, as noted above, such severe storms or hurricanes should not compromise the ability to manage longleaf pine habitat over the long-time horizon of this HCP. Further, the threat to the conservation bank posed by severe weather has to be weighed against the fragmentation and other threats currently faced by the gopher tortoise in Mobile County. Gopher tortoises and longleaf pine habitat continue to be lost in Mobile County due to a variety of on-going factors, including lack of management, urbanization, habitat fragmentation, and invasive, exotic species. Relative to these factors, the probable impact of hurricanes on the conservation bank seems a less pressing threat than those currently faced by the gopher tortoise on private lands in Mobile County.

In addition to hurricanes, southern pine-beetles could strike the mitigation bank thereby killing mature longleaf pines. However, this is unlikely to occur. Longleaf pine is very resistant to southern pine beetle, especially when grown under low-densities like that required for management of gopher tortoises. Longleaf pine under these conditions produces significant sap flow which protects the tree from southern pine beetle infestations. In addition, longleaf maintains its vigor over long rotations, especially when managed with periodic thinning of less vigorous trees – as is done when managing for gopher tortoises. If a southern pine beetle outbreak should occur at the site, the Board of Commissioners will harvest dead and dying timber on the tract only to the extent necessary to curb the spread of beetles and, most importantly, to perpetuate the longleaf pine ecosystem for the benefit of the tortoise.

Neighboring Landowners

The presence of an expanding gopher tortoise population on the bank site will increase the probability that landowners whose properties border the conservation bank may have tortoises utilizing habitat on these neighboring properties. Thus, it is possible that such neighbors could be subject to additional endangered species obligations. For example, tortoises on the conservation bank may forage on neighboring private lands or disperse to private lands bordering the conservation bank. Possible conflicts with neighboring landowners will be reduced in at least three ways.

First, the conservation bank will agree to provide all foraging habitat for gopher tortoises whose burrows are located on the bank site, including those near property borders, so that neighboring landowners are not required to provide any foraging habitat for tortoises found on the bank. For such tortoises, neighbors will not have to seek an incidental take permit for alterations to tortoise foraging habitat on their lands. Occupied burrows on neighboring lands will be subject to the take prohibition in the Endangered Species Act.

Second, if the neighboring property contains suitable habitat for gopher tortoises and the neighbor is concerned that tortoises might colonize his or her land, the Service will encourage the landowner to enter into a “safe harbor” agreement with the Service. Such agreements have been used successfully to conserve endangered species in the Carolinas

and Texas while providing private landowners with regulatory assurances. Under safe harbor agreements, landowners agree to protect and restore habitat and undertake other measures that will provide a net conservation benefit for endangered species. In return, the landowner receives assurances that his or her endangered species liabilities will not increase should the number of gopher tortoises increase on the property.

Third, tortoises that are translocated to the conservation bank will be marked by drilling marginal scutes on the carapace. Should these tortoises move onto neighboring properties within 1.5 years after their translocation, the landowner has only to alert the Board of Commissioners or the Service and allow the tortoises to be captured and reintroduced to the bank. This will not be allowed for tortoises that were not translocated to the conservation bank, including those existing on the bank today and the progeny of translocated tortoises.

Most important to dealing with any neighboring landowner issues that might arise is the development of a good working relationship between the Board of Commissioners, the Service and the neighboring landowners. The Service has several tools available to meet the needs of adjacent landowners including safe harbor agreements, memoranda of agreement, habitat conservation plans, and financial assistance through Partners for Wildlife and other programs.

Funding

The Board of Commissioners has hired Southeastern Natural Resources, Inc., to provide forest management expertise for the entire 7,000 acre Big Creek Lake tract, including the conservation bank. Southeastern Natural Resources (or subsequent forest management firms hired by the Board) will continue to provide expertise in longleaf pine and gopher tortoise management at the conservation bank. Funding for mitigation activities, including conservation of gopher tortoises, protection and management of the conservation bank, restoration and enhancement of longleaf pine habitat, monitoring of gopher tortoises and tortoise habitat, and other activities will be provided by private landowners and developers who seek incidental take pursuant to this HCP.

As noted previously in this document, this HCP will likely not fulfill the purpose and need or meet its biological objective if the cost of mitigation credits are more than landowners in Mobile County can reasonably afford. In addition, three factors raise the costs of implementation of this plan. First, conservation banking of gopher tortoises under the provisions of the Endangered Species Act is new. As such, the need to undertake extensive monitoring of gopher tortoises at the conservation bank is heightened. The monitoring plan outlined in this HCP will, therefore, be relatively costly. Second, several private landowners in Mobile County desire incidental take permit immediately. In order for mitigation to succeed in these cases, it is vital that restoration activities begin at the conservation bank immediately. The Board has already begun the process of longleaf pine restoration. Yet, more work is needed. Thus, funds are needed to help “jump start” restoration at the conservation bank. Third, gopher

tortoise relocation costs will be high because of the need to safely capture affected tortoises and to test all tortoises for URTD.

Consequently, in addition to mitigation fees, the Board and the Service will seek outside sources of funding, both private and public, to assist in the implementation of this HCP – specifically to cover monitoring costs, immediate habitat restoration activities, and tortoise relocation. If secured, such funding will reduce the costs of mitigation credits. However, unless and until such funding is obtained, landowners seeking a Certificate of Inclusion will be required to cover the entire costs of mitigation credits.

Duration of Plan

Under this HCP, the Board of Commissioners seeks an ITP for 100 years. After that time, the Board will no longer be responsible for undertaking the affirmative habitat management, monitoring, reporting, and other activities outlined in this HCP. Thus, upon expiration of the ITP, the Board will have the same responsibilities with respect to conservation of gopher tortoises as any other private landowner who owns lands containing occupied gopher tortoises habitat. However, unlike most other private landowners, it is the stated objective of the Board to maintain the undeveloped nature of the conservation bank and other lands surrounding Big Creek Lake in perpetuity.

Other Listed and Candidate Species

There are several species listed under the ESA that occur in Mobile County. However, only the eastern indigo snake (*Drymarchon corais couperi*), listed as a federally threatened species in 1978, is associated with the longleaf pine ecosystem, though it is also found in other habitat types. The snake's range encompasses Alabama, Florida, Georgia, Mississippi and extreme southeastern South Carolina. However, the snake appears to be extremely rare in Mississippi and Alabama (W. McDearman, pers. comm.).

The eastern indigo snake is closely associated with the gopher tortoise as it commonly nests and dens in gopher tortoise burrows. The snake is primarily threatened by habitat loss, though overcollecting and “gassing” of gopher tortoise burrows have also played a role in its decline. No eastern indigo snakes have been seen in Mobile County since 1976, so it is believed that the snake is very likely extirpated from the County (D. Nelson, pers. comm.). For this reason, this HCP does not allow take of eastern indigo snakes. If they should be discovered through gopher tortoise surveys done on private lands in accordance with this HCP, then take of that habitat will require a separate ITP.

One candidate for listing under the ESA may be impacted by this HCP. The black pine snake (*Pituophis melanoleucus lodingi*) is a subspecies of the pine snake and is confined to Alabama, Mississippi and Louisiana. Its range in those states coincides very closely with the range of the longleaf pine ecosystem. Like the gopher tortoise, the black pine snake prefers open-canopied, fire-maintained longleaf pine forests on upland sites with lush, herbaceous ground-cover. The snake dens in pine stumps and, occasionally, in

gopher tortoise burrows. The black pine snake is threatened by loss of longleaf pine, fire suppression, habitat fragmentation, urbanization, and direct mortality from cars (Duran 1998).

Duran (1998) cites 32 records of black pine snake occurrences in Mobile County. Speaking to the snake's presence in Mobile County, Duran (1998) states: "It is, of course, not too surprising that black pine snakes or other native animal populations retreat in the face of an encroaching city, and [it] is, in fact, somewhat surprising that pine snake populations appeared to persist in Mobile as long as they did.... Nowhere else does the status of the black pine snake need closer, more rigorous scrutiny and monitoring than in Mobile County where they have been extirpated from approximately half of their historical range."

The black pine snake is expected to benefit from this HCP. Given that the vast majority of the occupied gopher tortoise habitat to be taken under this plan is expected to be highly degraded and located in fragmented, urbanizing areas, the black pine snake is likely to benefit from the conservation, restoration, and management of longleaf pine habitat on the conservation bank. According to Mike Duran, the leading expert on the black pine snake, habitat management that benefits gopher tortoises will also benefit the snake (Duran, pers. comm.).

Black pine snakes are difficult to survey and monitor. Although difficult, trapping can be quite effective. However, it is believed that snakes learn to avoid the traps after being caught once (Duran pers. comm.) Trapping can be done year round though spring until mid-summer is the best time to trap. As part of this plan, the Board will allow the Service or other researchers access to the conservation bank to trap black pine snakes. Further, the Board and the Service will seek funding to undertake such surveys.

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APPENDIX A

CERTIFICATE OF INCLUSION

This certifies that the current owner(s), _____, of the following property [describe property location] is included within the scope of Permit No. [include permit number] issued on [insert date of issue] to the Board of Water and Sewer Commissioners of the City of Mobile, Alabama (hereinafter “the Board”) under the authority of Section 10(a)(1)(B) of the Endangered Species Act of 1973, as amended, 16 U.S.C. 1539(a)(1)(B). Such permit authorizes activities by participating landowners that will modify or destroy the habitat of [insert number of tortoises to be taken] threatened gopher tortoises subject to the terms and conditions of the permit and the associated habitat conservation plan.

This certifies that the Service has reviewed the current owner’s application and that landowner has paid the necessary mitigation fee to the Board in accordance with the permit and habitat conservation plan. After such review and upon such payment, the Board will sign this Certificate. Thereupon, the Service is given 60 days to relocate gopher tortoises from the property; such 60 day period ends on [insert date]. Once the tortoises have been removed or upon expiration of the 60 day period, the landowner will receive from the Service a copy of this Certificate signed by both the Board and the Service.

Date:

Representative
Board of Water and Sewere Commissioners of the
City of Mobile, Alabama

Date:

Representative
US Fish and Wildlife Service