



## **Guidelines for the Establishment, Management, and Operation of Gopher Tortoise Conservation Banks**



U.S. Fish and Wildlife Service  
Alabama, Louisiana, and Mississippi  
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The gopher tortoise (*Gopherus polyphemus*) is currently listed by the U.S. Fish and Wildlife Service (Service) as threatened in accordance with the Endangered Species Act (ESA) for populations occurring west of the Mobile and Tombigbee Rivers in Alabama, Mississippi, and Louisiana (50 CFR 17.11). Reasons for the gopher tortoise's listing under the ESA include habitat loss, habitat fragmentation, human predation, and declining density in remaining populations. One mechanism for assisting the goal of creating self-sustaining gopher tortoise populations is to establish gopher tortoise conservation banks that can serve as mitigation sites for losses of tortoises and tortoise habitat that occur on lands in the listed range.

Conservation banking programs for federally listed species are proving effective at mitigating losses of species habitat and providing regulatory certainty for all involved. Most listed species populations occur on private lands and public-private sector partnerships of this type are an important component of the recovery process. The Service's 1990 recovery plan for the gopher tortoise establishes short-term and long-term criteria involving public and private lands to de-list the species. The long-term objective, delisting, involves substantial commitments from private landowners. Establishing conservation banks is one method of creating larger, viable reserves in which gopher tortoise populations can function and be managed for long term.

This document provides guidance for those involved in the establishment, management, and operation of gopher tortoise conservation banks. It is subject to revision by the Service as new information related to gopher tortoises and the ecosystems they depend on becomes available. Templates to assist prospective bank owners/sponsors are available (contact the appropriate field office). General guidance for the establishment, use, and operation of conservation banks can be found at: <http://www.fws.gov/endangered/pdfs/conservation-banking.pdf>.

### **Gopher Tortoise Conservation Banking Criteria**

#### **Minimum Requirements**

The basic habitat requirements to be considered for a conservation bank for gopher tortoises are listed below and will be explained further in this document:

1. upland pine-dominated habitat that can support  $\geq 80$  adult tortoises at 1.5 acres/tortoise on priority soils and 2.5 acres/tortoise on suitable soils total,

2. upland pine-dominated habitat with  $\leq 70$  ft<sup>2</sup>/acre basal area (BA),  $\leq 70$  percent canopy/midstory cover,  $\leq 15$  percent shrub cover, and  $\geq 25$  percent herbaceous cover on priority soils and  $\geq 50$  percent herbaceous cover on suitable soils, and
3. upland pine-dominated habitat that can be maintained by frequent, prescribed fire

The basic standards required before a bank can begin to take relocated tortoises are listed below and will be explained further in this document:

1. CBA with management plan finalized and signed by all parties
  - a. The CBA will include: information on the exact legal location (recent formal survey of the property boundary required) and description of the bank and its service area; a recent title report identifying exceptions on the title or easement; how credits will be established and managed; how the bank will be funded, managed and protected in perpetuity; allowable activities and access; deed restrictions; and requirements such as environmental surveys, monitoring programs and reporting. Agreements are signed by the banker and the Service's Regional Director unless authority is delegated to the field office, in which case the Field supervisor may sign the CBA.
  - b. The management plan will: identify habitat or other management activities needed, describe the endowment necessary to carry out management in perpetuity, identify activities allowed to occur on the bank, and describe monitoring and reporting requirements for management.
2. Conservation easement conveyed
3. Adequate funding sources for interim and perpetual operation determined
4. Baseline population and credits available determined
5. A minimum of 50 acres must be thinned to  $\leq 70$  ft<sup>2</sup>/acre BA,  $\leq 70$  percent canopy/midstory cover,  $\leq 15$  percent shrub cover, and  $\geq 25$  percent herbaceous cover on priority soils and  $\geq 50$  percent herbaceous cover on suitable soils.

The bank can continue to be opened in increments meeting the above standards as long as habitat requirements to support a contiguous population of at least 80 adult tortoises is reached within 10 years of opening. Each increment will be subject to the acres per tortoise standards. The Service will work with the banker to determine a schedule for incremental bank openings based on habitat management, which will be outlined in the bank's management plan.

### Service Area

Each bank will have a maximum service area (SA), the area within which credit trading may occur, based on the gopher tortoise geographic regions and subregions (Figure. 1). These geographic areas are separated from adjacent areas predominately by major rivers and streams, alluvial floodplains or other unsuitable habitat, and unsuitable habitat outside the extant range of the species. These natural features are barriers to gopher tortoise movements, effectively separating populations demographically, and to some extent perhaps genetically as well. The purpose of this coarse regional and subregional classification is to depict the natural geographic areas where gopher tortoise population growth, decline, and viability is not likely to be significantly affected by tortoise immigration from adjacent regions or subregions.

There are four primary geographic SAs. Each bank will be automatically eligible for relocated tortoises from the same SA, and will be eligible for relocated tortoises from other SAs on a case-by-case basis, in part based on whether there are existing banks in other SAs. Tortoises will be relocated within their SA, unless there is not one available.

Two SAs span state lines. While these lines are biologically invisible, they do represent a potential political barrier. It is important to consider the laws, policies, and conservation strategies that each state may have regarding their wildlife. The Alabama Department of Conservation and Natural Resources (ADCNR) and Mississippi Department of Wildlife, Fisheries and Parks (MDWFP) have agreed to allow movement of tortoises across the political line separating the two states in SA “D” when the conservation banking program is regarded as the best vehicle for conservation of the tortoises in question. MDWFP has also agreed to allow movement of tortoises across the border with Louisiana when deemed appropriate (i.e. for movement within SA “A” and to or from another SA when judged necessary).

In addition, states shall have continuous participation in the banking program through a Tortoise Bank Review Team (TBRT) with the Service and possibly other federal or state agencies that have a stake in tortoise conservation. The TBRT shall review potential bank sites, monitor open and/or closed banks and will have the opportunity to review projects that may have the potential for tortoise translocation across one or more SA. The states have agreed that sufficient state agency review of potential inter-state and/or inter-SA translocations, and of the program as a whole, can be accomplished within the TBRT, therefore allowing the Service to assess the feasibility of each project through its consultation process. The Service will serve as the TBRT chair and final authority on translocation of tortoises that are inter-SAs but within a state’s boundary. In matters of inter-state translocations, the states have final say. The joint TBRT process is designed to evaluate the technical aspects of banking through a team approach.

### Soils

Only land containing soils classified as “priority” or “suitable” by the Service (Table 1) will qualify as tortoise relocation sites. Marginal and/or unsuitable soils will not be used in the calculations to determine stocking densities at the conservation bank; however, these areas can be used by tortoises as well as act as corridors and buffer areas, and therefore can be incorporated into the conservation easement. If available, USDA Natural Resources Conservation Service (NRCS) soil surveys can be used to determine soil type. However, prospective bankers may have a professional soil survey conducted to get a more detailed delineation of soil types on a particular bank site. If an approved NRCS soil survey is not available, a soil survey of the prospective bank site is required to determine if the minimum soil requirement is met. Not all soil series have been defined in terms of tortoise habitat by the Service; therefore, contact the Mississippi Field Office (601) 965-4900 if a particular soil series is not listed.

### Bank Size

The Service has not strictly defined a minimal area threshold. However, the area should be capable of holding a viable tortoise population (i.e., at least 80 adults). Generally, at least 200

acres of contiguous suitable upland soils or 120 acres of contiguous priority upland soils (or a combination of both soil types) would support a viable population. In some rare cases, a smaller bank site may be accepted if it has high conservation value, for example, if it connected two permanently protected areas with gopher tortoise populations or added significant habitat to a protected population. The Service will evaluate these prospective bank sites on a case-by-case basis.

Uplands are considered contiguous if two or more suitable/priority soil upland communities occur with no physical obstacle (e.g., paved road, railroad bed, impenetrable fence, dense pine plantation, lake, perennial stream or river) that would hinder tortoise movement to other upland areas within the conservation bank. The spatial availability of unfragmented tracts can vary depending on geographic regions. Accordingly, minimum area requirements may vary depending on these and related factors.

Characteristics of adjacent and nearby habitat will be considered (e.g., stand type, soil type), though a specific buffer requirement is not currently defined. Limited credits may be given for the inclusion of buffer areas only to the degree that such features increase the overall ecological functioning of the bank (see the Credit System section). However, a bank located within or near a large residential or developed matrix will be more difficult to approve because of future prescribed fire and smoke management problems as well as the reduction of potential connectivity between tortoise populations.

### Gopher Tortoise Baseline

The gopher tortoise baseline on the property will be determined according to a comprehensive, 100 percent survey before the banking agreement is drafted. All burrows on the bank site will be classified as active, inactive or abandoned, and georeferenced. Active/inactive burrows will be scoped to estimate the number of tortoises and colonies on the proposed property. The Service defines a colony as two or more burrows (active or inactive) within 600 feet of each other. Burrow widths will be used to estimate size-class or age structure.

The baseline will consist of the acreage of occupied habitat on priority/suitable soils. Occupied habitat is defined as the operational stocking definition of one tortoise per 2.5 acres on suitable soils and one tortoise per 1.5 acres on priority soils. By the operational definition, the baseline will be the estimated number of tortoises that are  $\geq 180$  mm in carapace length, multiplied by 2.5 acres of suitable soils and 1.5 acres of priority soils per tortoise (depending on where the tortoise is located). Eggs and juvenile tortoises ( $< 180$  mm carapace length for our purposes) are not considered in these calculations because of low survivorship and minimal effect on the recipient site forage base.

### Credit System

The number of conservation credits a bank has available will refer generally to the number of tortoises that a bank can hold. There will be two types of credits possible, Gopher Tortoise Credits (GTC) and Habitat Preservation Credits (HPC).

GTC will be based on the available unoccupied habitat as defined above, in terms of numbers of tortoises. These types of credits would be made available to projects deemed “high impact” by the Service and tortoises will need to be relocated to the bank. Typically, mitigation will be one GTC per tortoise impacted.

HPC are preservation credits given for the habitat on priority/suitable soils which baseline or resident tortoises reside. Issuance of HPC will depend on several factors, including the number of resident tortoises present and the likelihood of their survival in absence of the property becoming a bank. The Service acknowledges that in many cases, without the perpetual management activities generated by creation of a bank, those residents would disperse. HPC may also be given for buffer areas, such as small corridors of marginal soils that are managed as part of the bank and may serve as important connecting habitat or as a buffer against invasive species. Calculation of HPC for buffer areas is at the Service’s discretion and will vary for each bank. HPC from buffer areas shall not exceed more than 10 percent of the banks priority/suitable soils acreage. HPC are habitat only credits (i.e. no tortoises would be moved to the bank, thus an HPC will be offered at a much lower cost than a GTC) and would be made available to “low impact” projects, typically at one HPC per impacted tortoise. HPC may also be offered in conjunction with GTC for projects where mitigation requirements are deemed greater than one to one.

Example credit calculation:

A potential bank site consists of 600 acres, 100 acres of marginal/unsuitable soils managed as part of the legal boundaries of the bank (buffer areas), 300 acres of priority and 200 acres of suitable soils. The site contains 2 resident tortoises on the buffer areas and 10 residents on the priority/suitable areas. Using the stocking definition of 1.5 acres/tortoise on priority soils and 2.5 acres/tortoise on suitable soils, the bank’s tortoise capacity would be as follows:

$$(300/1.5) + (200/2.5) = 280 \text{ tortoises}$$

Subtracting the number of resident tortoises on the priority/suitable soils (to determine the unoccupied habitat available) gives the number of GTC available:

$$(280 - 10) = 270 \text{ GTC}$$

HPC would be the number of resident tortoises on the priority/suitable soils (those subtracted above), plus credits given for buffer areas, if any. [Assume in this example the Service determines that there are 5 acres of marginal soils that may serve as corridors between priority or suitable soils. Buffer acreage cannot exceed 10 percent of the total priority/suitable soils acreage ( $500 \times 0.10 = 50$ ), so 5 would be well within the limits):

$$10 \text{ resident tortoises} + 5 \text{ buffer credits} = 15 \text{ HPC}$$

Thus, this potential bank would have 270 GTC and 15 HPC available.

A fee will not be charged (nor credits used) for accepting tortoise eggs and young tortoises <180 mm in carapace length, and the conservation bank must accept all eggs and young tortoises associated with a relocated adult colony. When the bank capacity is reached, additional tortoises may be relocated to the site as approved by the Service on an individual basis. Conversely, if a

bank is found to have excess tortoises, those tortoises may be used by the appropriate state agency or Service to augment off-site populations, such as those on state wildlife management areas. The TBRT will review these scenarios on a case-by-case basis. The decision will be based upon degree of relocation success/failure, population size of the bank, and best available data on tortoise and burrow densities in the published literature or other sources.

Tortoises that migrate onto the bank from adjacent lands or buffer areas within the legal bank boundaries (immigrants or recruits), as well as tortoise eggs and young tortoises (<180 mm in carapace length) will not be considered in credit calculations once the bank has been established, thus the number of credits calculated when the CBA is signed is guaranteed to the bank, even if it is discovered at a later time that the originally calculated capacity has been exceeded (due to immigrants, recruitment, etc.).

The potential exists for practices such as credit stacking (allowing a single unit of land to provide multiple credit types and/or trade credits under multiple market-based strategies, where all credits can be sold independently) and are subject to Service review on a case-by-case basis.

### URTD Testing

See Attachment A for guidelines for conducting upper respiratory tract disease (URTD) testing. Due to the ongoing research regarding URTD, the Service will reserve the right to further evaluate and determine whether a prospective property with positive tortoises can accept relocated negative tortoises, or vice versa. Further clinical testing and monitoring of positive tortoises may also be considered. Only tortoises  $\geq 180$  mm in carapace length will be required to be tested for URTD due to the very low incidence of the disease in young tortoises, their low chance of contact with other individuals, and the potential harm of handling and drawing blood from a small animal.

#### *For Baseline*

All resident tortoises ( $\geq 180$  mm carapace length and up to 20 individuals per colony) on the bank will be captured and tested (ELISA) for URTD using Service approved methods (see Attachment A) before the bank is open. If all are ELISA negative and asymptomatic, then the bank may receive negative tortoises. If any are ELISA positive, then the bank may receive positive tortoises.

#### *For Relocations*

All tortoises that are to be relocated to the bank from another site will be captured and tested for URTD using Service approved methods (see Attachments A and B). Tortoises will be held separately until URTD tests are clear (see Attachment B). If all are negative and asymptomatic, then they may be relocated to a “negative” bank. Positive tortoises can be relocated to “positive” banks. Occasionally a tortoise will have a false positive, thus sometimes it may be worthwhile to perform a second test.

#### *For Monitoring*

The Service will not require URTD testing as part of normal monitoring procedures. However, after establishment of the bank, any colony found with a greater than 10 percent ELISA infection rate will be considered an infected population and will not receive negative individuals.

### Restoration and Management Plan

The banker will be responsible for all management activities necessary to restore (if applicable) and/or maintain suitable habitat conditions on the bank as described in the CBA and management plan.

#### *Suitable Habitat*

Suitable habitat consists of pine or pine-scrub oak dominated stands with an average pine BA  $\leq 70$  ft<sup>2</sup>/acre,  $\leq 70$  percent coverage of overstory and midstory woody plants,  $\leq 15$  percent shrub cover, and  $\geq 25$  percent herbaceous cover (native grasses and forbs) on priority soils and  $\geq 50$  percent herbaceous cover on suitable soils per stand or management unit. As tortoises need cover and forage, cleared sites cannot accept tortoises until some cover is established. Standard forestry practices are recommended to determine habitat parameters. Specific methods used to determine these measurements should be outlined in the agreement.

Herbaceous plant cover can vary significantly due to natural and other factors. On priority soils, the herbaceous plant layer usually is sparse, with less cover than in less excessively drained suitable soils. Nevertheless, prospective bank sites should be evaluated for actual and potential herbaceous plant cover upon restoration. In some instances, depending on site conditions, a  $>25$  percent herbaceous plant cover and composition standard may be required for site restoration before credits are released. In most of these instances, such requirements will be imposed because of scientific uncertainty on the ability of a degraded site to be restored to suitable conditions in the herbaceous plant stratum. Sites with a history of infrequent fire and a dense, closed vegetation structure eventually can lose a majority of the herbaceous plant layer, which may not be easily restored by common restoration treatments such as thinning and shrub control.

Longleaf pine (*Pinus palustris*) is the preferable overstory species because it is more fire tolerant and has fewer economic and silvicultural conflicts with the required management that will depend on frequent fire. Loblolly (*P. taeda*) or slash (*P. elliotti*) pine in existing stands at the time the CBA is initiated are acceptable when stocked according to the basal area and cover standards previously described. However, any loblolly or slash pine stand thinned to suitable basal area must be converted to longleaf pine when regenerated, either naturally or artificially, whether management is even- or uneven-aged, and at a rate that will provide suitable habitat cover and forage for tortoises.

#### *Restoration Activities*

Most sites will require some form of habitat restoration, which will be detailed in the individual CBA's management plan. Approved restoration practices include timber thinning, clearcutting, natural or artificial regeneration, prescribed fire, planting native herbaceous cover, and the

limited use of Service-approved herbicides. Any resident tortoise burrows should be temporarily marked and protected against collapse by vehicular equipment by a minimum 25-foot radius buffer. Prescribed fire may not be effective at sites where fire has been excluded and there is heavy shrub encroachment and poor ground fuels. Under these or related conditions, herbicide applications by directed foliar or stem sprays and/or mechanical suppression can be used to reduce and eliminate encroaching shrubs and hardwoods. Aerial herbicide broadcast applications may be used in rare instances, particularly in habitat not occupied by gopher tortoises and where the application will not adversely affect the residual herbaceous plant layer. Once restored, however, the habitat must be maintained by frequent, phonologically appropriate, prescribed fire. Fire frequency will be determined by site conditions, but most restored sites will require fire at intervals no longer than three years. Growing season prescribed fire will be required in most instances to effectively maintain suitable site conditions.

### *Timber Production*

The silviculture and economics of longleaf pine timber production are highly compatible with gopher tortoise habitat, with minor modifications. Existing stands of loblolly and slash pine can be thinned and retained, according to the habitat standards, and converted to longleaf when commercially mature or otherwise clearcut. At this time, production of loblolly or slash pine is not prohibited, but prescribed fire and all other habitat standards must be maintained, even when fire will damage young loblolly or other stands. In addition, economic return for loblolly and slash pine production at the required basal area and cover standards will be much more reduced, per acre, relative to standard silvicultural practices for longleaf.

Restored stands can be managed as even- or uneven-aged, with natural or artificial regeneration. During artificial regeneration, intensive site preparation practices, including bedding, shearing, root-raking, and similar practices, are prohibited. (Intensive site preparation normally should not be required in restored and maintained stands because desired understory and ground conditions will exist as a result of ongoing management with prescribed fire to exclude shrub encroachment.) Hand planting is preferred during artificial regeneration. Restoration is site specific; therefore, details will be laid out in the management plan.

All active and inactive gopher tortoise burrows must be marked and protected by a 25-foot radius buffer during timber thinning or other equipment operations (e.g., firebreak or food plot maintenance). Ideally, burrow surveys will be conducted after a prescribed burn, as this greatly facilitates location of burrows. Special consideration also is required for the placement of logging decks and logging trails.

### *Invasive, Non-native Species*

Plants -In order to successfully restore and maintain a suitable herbaceous layer for gopher tortoises, cogongrass (*Imperata cylindrica*) infestations will need to be monitored and controlled with a target for reduction. Monitoring shall consist of determining the location and size of cogongrass patches on a yearly basis, though comprehensive surveys will not be required. Cogongrass will require herbicide treatment before restoration work begins, and possible



ongoing treatment based on rate of infestation. Any equipment used in areas that have cogongrass should be cleaned before moving to other areas to prevent the spread of the plant.

Other exotic and highly invasive plants, such as Glossy and Chinese privet (*Ligustrum sp.*), Japanese climbing fern (*Lygodium japonicum*), Chinese tallow tree (*Triadica sebifera*), shrub lespedeza (*Lespedeza bicolor*), Tung oil tree (*Aleurites fordii*), and kudzu (*Pueraria lobata*), should be suppressed through basic restoration and management required to maintain the <15 percent shrub cover standard. Overall, these particular exotics should not comprise more than 10 percent of the entire bank. Any future new exotics deemed highly invasive by the Service shall be treated similarly. It is recommended to have contingency funding in place to deal with this potential situation.

Food Plots - Small food plots of non-native, non-invasive species (e.g., clover, cowpea, soybeans, wheat, oats, sunflower, rye, corn, American joint vetch) are allowed on up to two percent total of the bank site and do not count toward the 10 percent non-native total above. Use of native (and non-invasive) species is recommended where possible. Food plots should not be placed on priority soils and species such as Bermuda grass (*Cynodon dactylon*) and bahia grass (*Paspalum notatum*) will not be allowed as these species have been known to encumber longleaf restoration/regeneration. Rye grass (*Lolium spp.*) is highly discouraged. Care should be taken to avoid tortoises that may reside in or near the plot during management activities (burrows should be marked and protected in a 25 foot radius buffer from motorized equipment). The location, size, and type of food plots should be detailed in the management plan.

Fire Ants - Red imported fire ants (RIFA-*Solenopsis invicta*) have been shown to be detrimental to tortoise hatchling success, especially on non-priority soils. Therefore, reduction of RIFA may be necessary to enhance the reproductive success of gopher tortoises. A high density of RIFA will require chemical suppression. Prospective bank sites must be surveyed, and if needed, treated for RIFA before the bank is approved. There is some evidence that broadcast treatment of RIFA in areas where their density is very low can be detrimental to native ant populations. The Service reserves the right to determine when suppression is needed and encourages bankers to actively reduce RIFA, especially on roadways, to avoid future issues. Service-approved chemicals will be used according to label instructions, and care will be taken to apply chemicals in such a fashion that native ant species will not be significantly affected. Cooperation with the USDA on use of non-chemical control measures, such as establishment of experimental plots for introduction of phorid flies, is also encouraged. Specific details on fire ant suppression will vary for each bank and will be outlined in the bank's management plan.

RIFA colonies generally have territories with trails 30-50 feet away from a mound and a single queen colony can have about 20 to 80 mounds per acre. Currently, there are two suggested methods to determine initial density of RIFA.

1. Baiting method = place bait (e.g., piece of food on a biodegradable medium such as an index card) at intervals on a grid (approximately 1-2 traps per acre, depending on site conditions) throughout the site. The person conducting the survey should be well trained in distinguishing RIFA from other ant species. RIFA forage most actively when the temperature is consistently between 65 °F and 85°F, so sampling should be timed

accordingly. If there are more than 200 RIFA on the bait after 1 hour, that area should be treated and sampled again in 10 weeks to determine effectiveness.

2. Mound method = Count RIFA mounds in  $\frac{1}{4}$  acre circular plots across the site. This is best done after a prescribed burn. If densities are greater than 9 mounds per plot in an area (35 mounds/acre), that area should be treated. In general, more than 35 mounds/acre on more than 20 percent of the bank site can trigger broadcast application (e.g., aerial) of fire ant treatment. If the coverage is less than 20 percent, targeted ground application should be used. RIFA should be sampled in this manner at least every three years (coinciding with prescribed burns).

Overall, sampling frequency will depend on site conditions such as soil type, fire frequency, proximity to roads or other disturbed areas, and history of RIFA on the site. After determining initial density of RIFA on the bank site, areas in which RIFA were target treated should be sampled at least annually. Other areas of the bank can be sampled at lower frequencies, depending on habitat conditions (e.g., those areas on priority soils where habitat is restored and maintained by frequent fire will require infrequent, if any, sampling). If broadcast treatment is used, the entire site should be surveyed at least every three years (this should coincide with prescribed fire). The banker may work with the Service and entities such as the USDA Imported Fire Ant Laboratory to determine a plan for RIFA sampling and treatment.

Armادillos - Suppression of armadillo populations is also encouraged.

### Gopher Tortoise Relocation

See Attachment B, Standard Gopher Tortoise Relocation Guidelines. In general, gopher tortoises can be relocated between April 1 and October 15. A basic health examination on each tortoise and URTD testing will be conducted before tortoises are put in contact with others in acclimation pens. Tortoises will be placed in acclimation pens (with  $\geq 1$  acres suitable habitat available per tortoise) at the bank site for 1 year prior to release. Tortoises placed in pens after October 1 may be held over two winters to be released in April. Tortoises will be monitored as per the protocol explained below. A permit from the appropriate state wildlife department and the Service is required before any tortoises are handled.

### Monitoring

Monitoring is required to verify the long-term integrity of the restored habitat, to document changes from the baseline conditions at the time of establishment of a bank, and to verify the status of the resident and relocated tortoises. Monitoring plans should be reevaluated and updated at least every 5 years based upon site experience and best available scientific practices.

### *Long Term Tortoise Monitoring*

During bank operation, the status of the resident population will be assessed when the entire bank reaches 75 and 100 percent capacity (or at 5-year intervals from the date of the bank opening, whichever comes first). Capacity is the number of tortoises the bank can hold as calculated in the CBA from the acreage of suitable and priority soils (i.e. the baseline plus

number of credits the bank can hold). Number of resident tortoises will be determined by a comprehensive, 100 percent survey. Burrows will be classified as active, inactive or abandoned, georeferenced, and active/inactive burrows will be scoped to estimate the number of tortoises on the proposed property. Alternatively, a burrow occupancy factor of 0.414 tortoises per active/inactive burrows can be used in lieu of scoping at the 75 and beyond 100 percent capacity benchmarks. Burrow widths will be used to estimate size-class or age structure. Burrow occupancy rates can vary among sites; therefore, it would be of interest to the banker to scope burrows.

If there is a significant decrease of the known population (baseline plus relocated tortoises) at any given interval, the Service and banker will determine why the population is decreasing and work to fix the problem. A significant decrease is defined as a population decline of  $\geq 15$  percent at any interval. The Service reserves the right to stop relocation of additional tortoises (and credits being used) if warranted (e.g., due to disease outbreak that would endanger newly relocated tortoises), though as long as the management plan is being followed this would be needed under very rare circumstances.

Once the bank is full (all the credits have been used/capacity is reached), the baseline will again be determined (using the scoping method described above). Additional credits may be issued if capacity is not reached (due to emigration, predation, etc.) and the Service and TBRT determines there are no problems with the bank that are causing the population decline. The resident population should then be assessed at least every 10 years, or as written in the CBA, to determine baseline population status and availability of future credits.

### *Habitat Monitoring*

The banker will report pine and hardwood basal area, canopy cover, shrub cover, and herbaceous ground cover on each stand in the conservation bank at intervals that will be detailed in the CBA. For basal area and canopy cover, typical intervals are every five to 10 years depending on soils, pine growth, and how close the stand is to reaching 70 ft<sup>2</sup>/acre BA. Shrub and herbaceous cover may require annual reporting for the first few years, but the interval will increase as the habitat is restored and becomes managed primarily by frequent fire. GIS format (UTMs, lat/long, shapefiles, etc.) is desired where applicable. In addition, the banker will report an estimate of the number of acres impacted by cogongrass and RIFA. We recommend annually documenting changes in ecological structure photographically starting when the bank opens by establishing permanent photographic monitoring locations at each section or stand.

### Reporting

In order to evaluate compliance with the terms of the CBA and associated management plan, the banker will prepare an annual report to the Service by December 31<sup>st</sup> of that year containing the following information:

1. Number of tortoises relocated, including relocation project identifier (Biological opinion or HCP name or number and date, etc)
2. The results of URTD testing for each resident (if known) and relocated tortoise

3. The location of the donor and release site for each relocated tortoise and tortoise data collected, including sex of tortoise, the date of release, GPS location, photographs and the marking drilled on the marginal scutes of the tortoise's shell
4. A description of progress within the established management plan, including but not limited to: restoration and management activities and approximate acreage subject to such activities, including timber harvests, prescribed fire (date of burn), mechanical removal of hardwoods, and herbicide applications; and listing of important habitat parameters, including canopy cover, basal area, shrub cover, herbaceous cover and invasive species information (at appropriate intervals as per the management plan)
5. Emigration data, if known
6. Population trends (including burrow size-class distribution), if known
7. Other listed species encountered
8. A cumulative summary table or chart (by stand/area and year) of total number of tortoises present before relocations each year, number of tortoises relocated every year (by sex, URTD results, relocation project and service area), habitat parameters by stand/area (if definable) each year, other listed species encountered, any known loss of tortoises, and credits used and available at the end of each year and as requested by the Service between annual reports.
9. Photo documentation of habitat management activities (photos should be date stamped).

In addition, the Service, along with appropriate state biologists and/or other members of the TBRT, should visit the bank at least annually to inspect the progress of the conservation activities at the bank, preferably after the annual report is received.

#### Permits and Incidental Take

It is possible for a bank manager to establish and operate a conservation bank without any ESA section 7 or 10 authorization (incidental take permit) or state permits, provided that they do not take listed species or conduct their own trapping, scoping or handling of tortoises (e.g., consultants that hold their own permits may be hired to do all survey and relocation/handling work). However, we do suggest bankers hold their own permits. We recommend consulting with the state permitting authority and the appropriate Service Field Office to determine necessary permitting requirements.

#### Emergency Situations

The bank will not be held responsible for offsetting acts of nature that are unforeseen, or foreseeable but unpredictable, such as floods and hurricanes. The CBA will stipulate the general procedures for identifying, implementing, and funding remedial measures at a bank in the event of emergency or unexpected situations.

#### Remedial Actions

A CBA must include provisions for a dispute resolution process applicable if the owners of the bank fail to meet their obligations under the CBA. The Service, in consultation with the bank sponsor, will decide on the need for remediation.

### Real Estate Assurances

A perpetual conservation easement which transfers usage rights creating a legally enforceable land preservation agreement between a landowner (grantor) and a qualified land protection organization (grantee), such as a land trust or a governmental agency, is required. The easement holder (grantee) must be qualified pursuant to state laws. The Service (Regional Office - RO) shall approve the form of the conservation easement as well as the entity that will hold the easement. The Owner shall provide the Service with a copy of all easements recorded on the Property along with a legal easement. The easement shall contain, among other things, a provision granting to the Service a third party right of enforcement.

In the case of land trusts, the organization's Board of Directors should have in its corporate resolutions the adoption of the National Land Trust Alliance's *Statement of Land Trust Standards and Practices* as guiding the practices of the organization. (The Statement is available from LTA ([www.lta.org](http://www.lta.org) or 202-638-4725). Grantee's board of directors, officers, and staff may not have a conflict of interest concerning the conservation bank or permits issued by the Service or state in which the bank resides. The Service may require written certification that the land trust board of directors, officers and staff, as holders of conservation easements, will not receive benefit, financial or otherwise, from the issuance by the Service of the underlying permit or incidental take authorization or conservation banking agreement.

### Financial Assurances

The bank agreement must identify an adequate funding source to provide for interim and perpetual operation, management, monitoring, and documentation costs. Funding for the start-up and interim management program (e.g., purchase of land, property taxes, initial restoration, or legal fees) should be separate from the requisite endowment for ongoing actions. Letters of credit may be required. The Service's RO shall have final approval over endowment documents.

A target date and target amount must be determined. The endowment must be fully funded before all credits are sold, preferably within the first 3-4 years of the bank's operation. A master escrow account should be established concurrent with execution of the CBA. All credit sales/trades are deposited into escrow and a portion of each credit sale deposited is used to fund the long-term and interim management account (if needed). In the event the long-term fund is not fully funded by the end of the target date, the owner shall immediately convey the remaining amount.

Some conservation banks will also have short-term costs, usually associated with restoration or enhancement of the bank site, fencing, equipment purchases, or other such start-up costs. An interim management account (i.e., a dedicated, interest bearing account in an amount adequate to cover short-term costs and contingencies) should be established. Other potential assurances may include performance bonds or letters of credit; however, an interim management account is usually preferable. For example, establishment of an interim management account can serve as a contingency fund to manage the property that may not be expended except as agreed to by the Parties and that must be replenished if expended. Once an agreed upon target amount is reached,

this account may be terminated and all funds (except interest retained by the banker) will be transferred to the endowment fund.

One strategy for long term funding is to establish a non-wasting management endowment (i.e. a fund that generates enough interest each year to cover the costs of the yearly management). This endowment could be established by including the cost of management into the price per credit. As credits are sold, an agreed upon portion of the proceeds can be deposited into a non-wasting endowment fund or escrow. The size of the required endowment will depend on certain factors, including land management activities, rate of inflation, and interest rate. The cost of each credit will ultimately be determined by the banker.

### Other

Banks should refrain from publicizing their location to avoid unauthorized dumping of tortoises.

Gopher tortoise banks can be compatible with other conservation banking so long as the standards are met for each bank type. The Service will review this possibility on a case-by-case basis. The Service must also approve any change of bankers.

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If you are interested in establishing a gopher tortoise conservation bank, please submit the following information to USFWS, ATTN: TBRT, 6578 Dogwood View Parkway, Jackson, MS 39213.

### **Bank Proposal Checklist**

**Bank name** - We recommend a short name based on a geographic feature if possible.

**Contacts** - Name, address, phone, fax and email address for prospective bank owner, manager, etc.

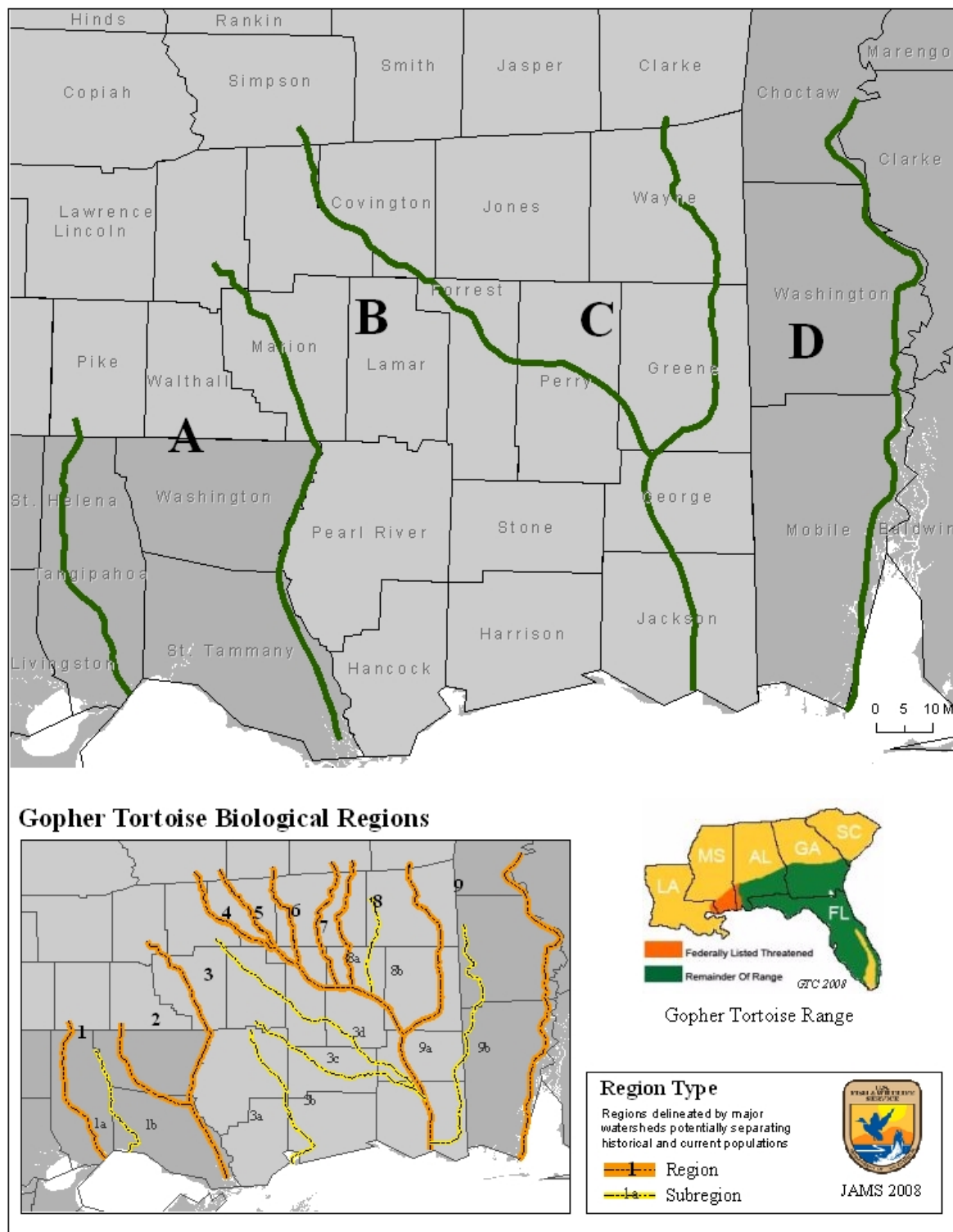
**Location** - General map or aerial photos of the proposed bank showing bank location in reference to cities, rivers and other major geographic features and/or GPS or GIS data of the bank's location (boundary lines or corner points). Maps can be created using [maps.google.com](http://maps.google.com) or other web pages.

**Site description** - Brief description of the site conditions and habitats; species known or potentially present; land history; and description of wetlands, waters, and hydrology if relevant.

**Soils** – Any information regarding soils found on property.

**You may also want to include-** Photos of the site; Proposed enhancements; Site history including past land uses; Surrounding land uses and zoning; Anticipated future development in the surrounding area.

## Gopher Tortoise Conservation Banking Service Areas



**Figure 1.** Service Areas (USFWS 2008)

**Table 1.** U.S. Fish and Wildlife Service gopher tortoise soil classification (see the Service's Gopher Tortoise Soil Classification for the Listed Range-2005, for more information).**Priority Soils**

<b>Series</b>	<b>Class</b>
Lakeland	Thermic, coated Typic Quartzipsamments
Alaga	Thermic, coated Typic Quartzipsamments
Eustis	Siliceous, thermic Psammentic Paleudults
Wadley (Troup)	Loamy, siliceous, subactive, thermic Grossarenic Paleudults
Bigbee <sup>1</sup>	Thermic, coated Typic Quartzipsamments

<sup>1</sup>Provisional inclusion.**Suitable Soils**

<b>Series</b>	<b>Class</b>
McLaurin	Coarse-loamy, siliceous, subactive, thermic Typic Paleudults
Benndale	Coarse-loamy, siliceous, semiactive, thermic Typic Paleudults
Heidel	Coarse-loamy, siliceous, subactive, thermic Typic Paleudults
Bama	Fine-loamy, siliceous, subactive, thermic Typic Paleudults
Smithdale	Fine-loamy, siliceous, subactive, thermic Typic Hapludults
Ruston	Fine-loamy, siliceous, semiactive, thermic Typic Paleudults
Lucedale	Fine-loamy, siliceous, subactive, thermic Rhodic Paleudults
Lucy	Loamy, kaolinitic, thermic Arenic Kandiudults
Shubuta <sup>1</sup>	Fine, mixed, semiactive, thermic, Typic Paleudults

<sup>1</sup>Provisional inclusion.**Marginal Soils**

<b>Series</b>	
Baxterville	Fine-loamy, siliceous, subactive, thermic Plinthic Paleudults
Malbis	Fine-loamy, siliceous, subactive, thermic Plinthic Paleudults
Poarch <sup>1</sup>	Coarse-loamy, siliceous, semiactive, thermic Plinthic Paleudults
Saucier	Fine-loamy, siliceous, subactive, thermic Plinthaquic Paleudults
Susquehanna	Fine, smectic, thermic Vertic PaleudalFs
Boswell	Fine, mixed, active, thermic, Vertic PaleudalFs
Lorman	Fine, smectitic, thermic Chromic Vertic HapludalFs
Freestone	Fine-loamy, siliceous, semiactive, thermic Glossaquic PaleudalFs
Freest	Fine-loamy, siliceous, active, thermic Aquic PaleudalFs
Prentiss	Coarse-loamy, siliceous, semiactive, thermic Glossic Fragiudults
Savannah	Fine-loamy, siliceous, semiactive, thermic Typic Fragiudults
Basin <sup>1</sup>	Coarse-loamy, siliceous, semiactive, thermic FragiAquic Paleudults
Petal <sup>1</sup>	Fine-loamy, siliceous, active, thermic Aquic PaleudalFs

<sup>1</sup>Some poarch soils may be considered suitable by the Service



**Attachment A. Gopher Tortoise URTD Testing Guidelines**

All relocated gopher tortoises will be examined for visual signs of URTD. Only tortoises >180 mm carapace length will be sampled. A blood sample will be collected for each tortoise and sent to the University of Florida for an ELISA test for URTD antibodies. Because of the specialized expertise needed for this sampling effort, only field personnel with experience extracting blood for URTD should be permitted to handle tortoises (see guidelines below). Immediately following data/blood sample collection, each tortoise will be given an opportunity to drink water.

**Collection and Preparation of Blood Samples from Gopher Tortoises  
for Determining Exposure to Mycoplasma**

(adapted from the Florida Fish & Wildlife Commission's guidelines)

**I. Overview of Upper Respiratory Tract Disease**

Upper respiratory tract disease (URTD) is a highly contagious disease that has been observed in some species of tortoises and turtles. In gopher tortoises, one known causal agent is the bacterium *Mycoplasma agassizii*. URTD is transmitted by close contact between tortoises. Clinical signs of URTD include nasal or ocular discharge, swollen eyelids, and conjunctivitis. Although clinical signs may appear 1-2 weeks post-exposure, it takes 6-8 weeks for an exposed gopher tortoise to develop an immune response detectable by current diagnostic tests. Exposure to URTD may not necessarily confer immunity; in fact, gopher tortoises exposed a second time may become ill more quickly than when initially exposed. A blood test, known as an enzyme-linked immunosorbent assay (ELISA), is currently the most effective, rapid, and inexpensive way to detect exposure to mycoplasma. However, the test indicates only whether a gopher tortoise has built up antibodies to the pathogen. Therefore, it cannot distinguish between asymptomatic carriers (which pose a threat to healthy tortoises) and those individuals that have cleared the pathogen and are no longer infected. Hatchling tortoises up to one year old may test positive due to antibodies passed from a positive female to the hatchlings via the egg, but the pathogen itself is not transmitted through the egg.

**II. Collection and Preparation of Blood Samples**

**Preliminary information:** Blood samples for ELISA tests are routinely collected from a tortoise's brachial vein, though blood can be collected successfully from other locations. The brachial vein is most easily accessed in the upper, lateral portion of the tortoise's forelimb, where the skin is relatively unscaled. This area is not accessible when the tortoise folds its legs against its shell, so the leg will need to be stretched away from the shell to access the vein. Although there are seldom visual clues to the vein's precise location, the moveable, rope-like vessel can usually be felt by squeezing one's thumb and forefinger between the leg bone near the top of the limb and the stiff tendon at the limb's bottom. If the person drawing the blood is right-handed, it will be easier to extract the sample from the left forelimb (but either forelimb can be used). The collector should hold the tortoise's leg with the left hand, extending the left index finger between the leg and head to stabilize the limb; the right hand can then direct and control the syringe. Unless the person sampling the tortoise is using a specially designed restraint device, blood sampling will be a 2-person operation. Placing the tortoise on an empty, overturned large coffee can makes it easier to restrain. The can and sampling area may be covered with newspapers that are changed after each tortoise and discarded to prevent transmitting disease from one tortoise to another. Similarly, holding boxes, measuring/marketing equipment, and the hands of all persons in contact with tortoises should also be sprayed with a mild bleach solution (1 part bleach to 30 parts water). Persons not wishing to spray their hands with the solution can wear and change disposable exam gloves, using a new pair to handle each tortoise.

**Blood collection:** Prior to sample collection, clean the skin on the upper forelimb with an alcohol swab (70% alcohol poured onto a cotton ball or 1" x 1" gauze will suffice). Place a sterile 25-gauge needle on a sterile 1 ml or 3 ml syringe (persons may find the 3 ml syringe more difficult to handle during blood collection). Use a new syringe and needle for each tortoise. Prepare the syringe for easier blood collection by moving the plunger back and forth several times. Holding the syringe so that the needle bevel is up, gently insert the needle into the forelimb at approximately a 30-40 degree angle (i.e., do not insert the needle at a 90 degree angle). Vein position tends to vary somewhat between tortoises, so begin slowly drawing the plunger back as soon as the needle has entered the skin. If no blood is drawn, insert the needle deeper while gently pulling on the plunger until blood begins to collect in the syringe. If blood clots in the needle, it is best to replace the needle and try again. Once the vein is accessed, draw 0.3-1 ml of blood. Many tortoises attempt to move their forelimbs during blood collection: if the needle comes out of the vein, gently move the syringe forward or backward to access the vein again. Avoid lateral movements (i.e., slashing) that might sever the vein. After an appropriate amount of blood is obtained, carefully withdraw the needle and apply direct pressure to the vein (using gauze or a cotton ball) to stop bleeding and prevent bruising. The blood should be immediately transferred to a green-top, heparinized microtainer tube (see attached list of supplies and suppliers). Remove the needle from the syringe and the green top from the tube before transferring the blood to the microtainer to prevent breakage of the blood cells. To allow the heparin to prevent clotting, replace the green top and gently invert the tube several times. Place the microtainer, preferably upright, into a cooler filled with ice.

**Preparation and shipping:** Separation of plasma from the whole blood sample can be accomplished in one of two ways: by refrigeration overnight (keeping the tube in an upright position) or by centrifugation. If the latter method is used, the sample should be spun for about 10 minutes. The clear liquid at the top of the microtainer should be drawn into a sterile, disposable pipette and transferred to a cryotube (see supply list). Label the cryotube with the **person's name, unique identification number (consisting of the abbreviated project/property name and a consecutive number, e.g. Lantana Kingdom = lantking02, lantking03 etc.), and date sample collected**. Please print as legibly as possible. Send at least 0.1 ml of plasma. Discard red blood cells left behind in the bottom of the microtainer.

If samples are to be shipped immediately, keep them refrigerated until ready to ship. If samples cannot be shipped immediately, store at -20°C in a manual defrost freezer (i.e., without automatic defrost cycle). It is important to avoid repeated freezing and thawing of samples.

Currently, the only known laboratory providing ELISA tests is the Mycoplasma Testing Lab, University of Florida. It can be contacted (telephone: 352-392-2239, x 3968) to request a sample submission form\* and to convey information regarding the number of samples and the expected date of shipment. Make sure that the samples arrive at the Lab on a weekday. Ship samples on ice packs or dry ice via Fed Ex Priority Overnight Service to:

Mycoplasma Testing Lab  
University of Florida Department of Pathobiology  
1600 SW Archer Road - BSB 350  
Gainesville, FL 32610

Turn-around time for serology is usually about 2-4 business days, excluding the day on which the samples arrive. An invoice will be sent with the sample results.

\* - Sample submission forms must include a contact person, complete project name, listing of sample identification numbers, County, and Township, Range and Section.

### III. Interpretation of test results

The ELISA test measures the presence of *M. agassizii*-specific antibodies in tortoise plasma. This test is optimized to avoid false negative results (i.e., identifying an infected tortoise as being uninfected). Sample results are expressed as ratios between the optical density of the sample and that of a negative control; the higher the ratio, the more likely it is that a sampled tortoise has built up antibodies to mycoplasma. Sample ratios  $>3$  are considered positive, ratios  $>2$  and  $<3$  are suspect, and ratios  $<2$  are negative. A positive result indicates that a tortoise has been previously exposed to *M. agassizii* or other similar mycoplasma. Individuals that test positive may be subclinically infected (without clinical signs of URTD), clinically ill (with clinical signs), or convalescent (recovered from the infection, but still have circulating antibodies). As with any test, there is the possibility of a false positive result. Positive and suspect tortoises should be observed closely for signs of URTD and should be isolated from other tortoises, especially those that test negative. Until more is known about seropositive tortoises, these individuals should be considered carriers of mycoplasma and a potential source of infection for other tortoises.

A negative result indicates that there were no detectable antibodies to *M. agassizii* or related mycoplasma in the plasma provided to the Lab. A negative result does not mean that the individual will never develop the disease; the test result only reflects the status of that tortoise at the time the sample was collected. Moreover, negative results for a portion of a particular tortoise population do not mean that URTD is not present in that population.

#### Recommended gopher tortoise URTD testing supplies

- Monoject syringes 1cc
- Monoject 25 x 5/8 gauge poly hub needles (or terumo tuberculin syringe with needle)
- Gauze sponges
- Microtainer plasma separator tubes with lithium heparin (green top)
- Transfer pipets, sterile/individually wrapped
- Latex gloves
- Sarstedt screw cap micro tubes (cryotubes)
- Isopropyl alcohol
- Clorox bleach - use 1 part bleach/30 parts water solution to disinfect all equipment and hands after each tortoise.
- Plastic storage boxes - use to hold individual tortoises temporarily while obtaining blood samples

**Attachment B. Standard Gopher Tortoise Relocation Guidelines**

- Current protocol states that gopher tortoises can be relocated between April 1 – October 15 of a given year.
- Tortoises will be relocated only by permitted parties (contact the state(s) in which capture and relocation will occur).
- Before trapping, collapsing, or excavating burrows during the nesting season (mid-May to September), the apron near the entrance of the burrow will be examined for eggs. Any eggs found will be carefully excavated, carried without rotation, and reburied in a suitable burrow apron at the relocation site. Egg relocation sites will be documented and protected by wire coverings constructed of a two inch mesh size to exclude mammalian predators, but large enough to permit hatchlings to escape.
- All active and inactive burrows found at the origin site will be checked and tortoises removed by trapping and/or excavation to determine that the burrow is unoccupied. In the state of Mississippi, in areas where permanent habitat loss will occur, excavation (either up front or after trapping) will be required. Burrows classified as abandoned just after the dormant season (April-May) will need to be scoped and possibly excavated because of the chance the tortoise has not become active. In areas where permanent habitat loss will occur, and tortoises were removed via the trapping method, burrows will be collapsed after any tortoises are removed.
  - *Trapping method:* all active burrows will be fitted with wire have-a-hart traps. Bucket traps may be allowed in some instances. All traps should be clearly marked “Do not disturb”. Traps will be sufficiently shaded to prevent overheating of a trapped tortoise and will be checked at least twice daily, once in late morning and once in late afternoon. Following capture of a tortoise, burrows will be scoped to ensure that additional tortoises/commensals are not present. If tortoise absence is unclear (i.e., the scope does not reach the bottom or is blocked by a turn or sand pile), the burrow will need to be excavated. After it is certain that no tortoises or commensals are present, the burrow will be collapsed in areas where permanent habitat loss will occur.
  - *Excavation method:* Any burrow excavation efforts will be directly supervised by a biologist with experience excavating gopher tortoise burrows. Hatchling and subadult burrows (burrow width <2.0 cm) will be hand excavated, using shovels. Before beginning hand or backhoe excavation, a flexible tube, with length graduations marked, will be inserted into the burrow to ensure that the burrow path is not lost and to indicate the distance to the end of the burrow or to the tortoise/commensal. Throughout the excavation process, the burrow will be frequently inspected to ensure that the tortoise/commensal has not moved to a position where it might be injured by the backhoe or shovel. The last 1-2 feet of the burrow will be excavated by hand using shovels and small hand spades. Following removal of the tortoise/commensal, all excavated burrows will be refilled.
- It is possible that the eastern indigo snake (*Drymarchon corais couperi*), the black pine snake (*Pituophis melanoleucus lodingi*), the southern hognose snake (*Heterodon simus*), and/or the

Mississippi gopher frog (*Rana sevosia*) could be encountered while tortoises are being trapped or during burrow excavations. All of these species are state listed in Alabama and Mississippi; additionally, the gopher frog is federally listed as endangered, the eastern indigo snake is federally listed as threatened, and the black pine snake is a federal candidate for listing. If any of these species are found in tortoise burrows, or in traps placed at burrow entrances, they should be photographed to provide unequivocal identification, and the Service and appropriate state agency should be contacted immediately regarding appropriate disposition of these animals.

- Each relocated tortoise will be digitally photographed, measured, weighed, sexed (if possible), aged (if possible), and marked using a standard marginal scute numbering scheme. Contact the appropriate state agency to determine what numbering scheme to use. Scute shavings shall be placed in individually marked envelopes or containers and sent to the Service's Mississippi Field Office for DNA storage. Containers should be marked or linked to data sheets with the animal number, date, relocation and recipient site, sex, and age. Care should be taken to clean any marking instrument with alcohol to prevent contamination between animals. Axillary pockets should be examined for the presence of tortoise ticks (*Amblyomma tuberculatum*). If seen, one may be removed and preserved as a voucher specimen (send to Tom Mann, MDWFP); all others should be left in place and the number seen on each individual tortoise should be recorded.
- All relocated gopher tortoises will be examined for visual signs of upper respiratory tract disease (URTD). Blood samples will be sent to the University of Florida for an ELISA test for URTD antibodies (see methods, Attachment A). Any symptomatic or ELISA positive tortoises will be separated from other tortoises and will be immediately reported to the Service. Because of the specialized expertise needed for this sampling effort, field personnel should have experience extracting blood for URTD analysis. Immediately following data/blood sample collection, each tortoise will be given an opportunity to drink water.
- To minimize the risk of disease transmission, all material used during the displacement of gopher tortoises from the original site (e.g., traps, shovels, backhoe buckets, remote video cameras, etc.) to the bank will be disinfected with a dilute chlorine solution after each use. Tortoises will be handled with disposable latex gloves that will be changed after handling each tortoise. Tortoises should be transported within vehicles (not in open truck beds) and should be kept at moderate temperatures at all times (e.g., 70-85° Fahrenheit)
- Tortoises should be held in individual containers or pens until URTD tests are clear.
  - Containers must be large enough to allow the tortoise to turn around, have adequate ventilation, and be kept in shaded conditions with moderate temperatures (e.g., 70-85° Fahrenheit). Tortoises should not be exposed to extreme temperature changes (e.g., air conditioning). Tortoises may not be kept in containers over 5 days and should only be housed in containers >24 hours while awaiting URTD test results. Containers may be lined with moist soil or hay and tortoises should be given water. Native foods may be given if kept >24 hours.
  - If temporarily penning tortoises while awaiting URTD test results, pens must have a burrow, adequate shade, and food. Burrows will be inspected with a remote video system to ensure that they are unoccupied before releasing tortoises. In

areas with limited numbers of existing unoccupied burrows, starter burrows will be dug for release of displaced tortoises as described below.

- After URTD testing is cleared, relocated tortoises will be placed in larger, acclimation holding pens (with  $\geq 1$  acres suitable habitat available per tortoise) on the bank, with unoccupied burrows, or starter burrows (at least one per tortoise), for one year. Only one colony will be allowed per acclimation pen. Tortoises placed in pens after October 1 may be held over two winters to be released in April. Starter burrows for individuals in each colony will be located within 600 feet of each other. The pen must be removed after the acclimation period.
  - Release burrows will be inspected with a remote video system to ensure that they are unoccupied before releasing tortoises. In areas with limited numbers of existing unoccupied burrows, starter burrows will be dug for release of displaced tortoises. Starter burrows will be dug at a 20-30 degree angle with (sharpshooter) shovels/post hole diggers/power augers to the greatest distance possible (minimum 3 - 4 feet). Starter burrows should have a size and shape similar to the burrow being replaced.
  - It is important that the roof of the burrow should be close to the same height as the depth of the shell of the animal to be placed therein. This can be difficult to do with post-hole diggers unless wielded carefully. Sharpshooter shovels are recommended over conventional shovels for creation of broad, relatively flat tunnels.
- If a tortoise moves off site, it should be recaptured and penned through the next dormant season before release.
- Record all activity and data and report to the Service annually.