United States Department of the Interior

FISH AND WILDLIFE SERVICE
1875 Century Boulevard
Atlanta, Georgia 30345

In Reply Refer To:
FWS/R4/ES

SEP 19 2012

Mr. Dave White, Chief
U.S. Department of Agriculture
Natural Resources Conservation Service
Post Office Box 2890
Washington, D.C. 20013

Dear Chief White:

This document transmits the U.S. Fish and Wildlife Service's (Service) amended programmatic biological opinion and conference report/opinion (collectively "the Opinion") regarding the implementation of the Natural Resources Conservation Services' Working Lands for Wildlife Program for the gopher tortoise (*Gopherus polyphemus*) (WLFW – GT) and other species (collectively the "covered species") on eligible private lands in the states of Alabama, Florida, Georgia, Louisiana, Mississippi, and South Carolina. This amendment is based on the request by the Natural Resources Conservation Service (NRCS) dated August 24, 2012. Our review is based on information provided by the NRCS, jointly developed conservation measures, and information in Service files.

INTRODUCTION

NRCS and the Service have jointly agreed to a streamlined consultation process whereby a programmatic biological assessment and biological/conference opinion are combined and jointly developed. Therefore, this Opinion serves both purposes and functions as stated above. Specifically, this Opinion evaluates the adverse, benign, and beneficial effects and consequences of the WLFW – GT Program and its components (as described in the scope of the action section below) on the gopher tortoise and the listed and candidate species identified in Table 1. This opinion has been prepared pursuant to and complies with section 7 of the Endangered Species Act (ESA) of 1973 (the ESA), as amended (16 U.S. Code [U.S.C.] 1531 et seq.) and 50 Code of Federal Regulations [CFR] §402 of our interagency regulations governing section 7 of the ESA.

Section 7(a)(2) of the ESA requires federal agencies to consult with the Service to ensure that any action authorized, funded, or carried out is not likely to jeopardize the continued existence of any federally listed species nor destroy or adversely modify critical habitat. The Service and the federal agency or its designated representative implement section 7 of the ESA by consulting or conferring on any federal action that may affect federally listed or proposed threatened and endangered species and/or designated or proposed critical habitat.

Use of the conference procedures is only required when a federal agency proposes an activity that is likely to jeopardize the continued existence of a species that has been proposed for listing under the ESA or the proposed activity is likely to destroy or adversely modify proposed critical habitat (see 50 CFR 402.10). However, as in this situation, the conference procedures may also be used to assist a federal agency in planning a proposed action" ... to conserve candidate species since these species by definition may warrant future protection under the Act." (see Consultation Handbook, section 6.2). The conference process is designed to assist the federal agency in identifying and resolving potential conflicts at an early stage in the planning process. During the conference, the Service may provide advisory recommendations on ways to minimize or avoid adverse effects. The conclusions reached during a conference and any recommendations are to be documented by the Service and provided to the action agency in a document whose style and magnitude is expected to vary based on the complexity of the conference (50 CFR 402.1 O(e)).

Chapter 6 of the Service's Consultation Handbook recommends the preparation of a "Conference Report" when a proposed federal action may affect a proposed or candidate species but the action is not likely to jeopardize the continued existence of a proposed or candidate species. This Report contains the Service's analysis of the expected adverse, benign, and beneficial effects likely to result from implementation of WLFW-GT Program within the action area.

This Report evaluates the collective effects of implementing all aspects of the WLFW-GT Program on the species and its habitat. Overall effective implementation of the NRCS conservation practices and their associated conservation measures described in this Report are anticipated to result in a positive population response by the species by reducing or eliminating potential adverse effects. However, implementing the conservation practice standards and associated conservation measures may also result in short-term adverse effects to individual gopher tortoises in order to secure long-term benefits to the species as a whole. This Opinion is based on the best available scientific and commercial data including electronic mail and telephone correspondence with NRCS officials, Service files, pertinent scientific literature, noted hyperlinks, discussions with recognized species authorities, and other scientific sources. A complete administrative record of this consultation is on file in the Southeast Regional Office in Atlanta, Georgia.

CONSULTATION HISTORY

In mid-December of 2011, representatives from NRCS approached the Service with the concept of applying targeted Farm Bill dollars to eligible private landowners potentially interested in the recovery and conservation of listed, candidate or declining species of mutual interest.

Between December of 2011 and February of 2012, the NRCS and the Service held a series of informal conference calls and meetings to further refine the concept as identified above.

March 8, 2012: The Secretaries of Agriculture and Interior jointly announced a collaborative partnership collectively known as the Working Lands for Wildlife project and identified seven species across the United States which would share approximately $33 million dollars of NRCS' Wildlife Habitat Incentive Program allocation under the 2008 Farm Bill. The gopher tortoise was one of the selected species for this partnership.

April 17-19, 2012: The NRCS, Service, and Florida Fish and Wildlife Conservation Commission met in Tallahassee, FL to further coordinate and refine the NRCS Conservation Practices and implementing

measures that would be beneficial to the gopher tortoise. Discussions included ESA requirements to consult on expenditures of federal funding and NRCS requested section 7 consultation on the Working Lands for Wildlife Gopher Tortoise Program.

July 3, 2012: The NRCS was provided a draft of this opinion to review.

July 31, 2012: The NRCS was provided a final opinion.

August 6, 2012: A conference call between the Service and NRCS was held to discuss several concerns raised about two of the conservation measures contained in the opinion.

August 24, 2012: The NRCS formally requested several revisions to the opinion.

Table 1. Species and critical habitat evaluated for effects and those where the Service has concurred with a "not likely to be adversely affected" determination. Those species designated as gopher tortoise burrow commensals will be evaluated together. (C=Candidate; E=Endangered; T=Threatened).

Common Name	**Federal Status**	**Critical Habitat**	**Burrow Commensal**	**Not Likely to be Adversely Affected**
Gopher tortoise (West of Mobile/Tombigbee Rivers, AL)	T			
Gopher tortoise (East of Mobile/Tombigbee Rivers, AL)	C			
Dusky (=Mississsippi) Gopher Frog	E	X	X	
Black Pine snake	C		X	
Eastern Indigo snake	T		X	
Frosted flatwoods salamander	T	X		X
Red Hills salamander	T			X
Reticulated flatwoods salamander	E	X		X
Striped newt	C			X
Audubon's Crested caracara	T			X
Bachman's warbler	E			X
Cape Sable Seaside sparrow	E	X		X
Everglade Snail kite	E	X		X
Florida Grasshopper sparrow	E			X
Florida scrub-jay	T			X
Kirtland's Warbler	E			X
Mississippi Sandhill crane	E	X		X
Piping Plover	T	X		X
Red Knot	C			X
Red-Cockaded woodpecker	E			X
Roseate tern	T			X
Sprague's Pipit	C			X

Common Name	Federal Status	Critical Habitat	Burrow Commensal	Not Likely to be Adversely Affected
Wood stork	E			X
Florida torreya	E			X
Florida Bristle fern	C			X
Louisiana quillwort	E			X
Aboriginal Prickly-apple	C			X
American chaffseed	E			X
Apalachicola rosemary	E			X
Avon Park harebells	E			X
Beach jacquemontia	E			X
Beautiful pawpaw	E			X
Big Pine Partridge pea	C			X
Blodgett's silverbush	C			X
Britton's beargrass	E			X
Canby's dropwort	E			X
Cape Sable Thoroughwort	C			X
Carter's Small-Flowered flax	C			X
Carter's mustard	E			X
Chapman rhododendron	E			X
Cooley's meadowrue	E			X
Crenulate lead-plant	E			X
Deltoid spurge	E			X
Everglades bully	C			X
Florida Golden aster	E			X
Florida Pineland crabgrass	C			X
Florida Semaphore Cactus	C			X
Florida bonamia	T			X
Florida brickell-bush	C			X
Florida prairie-clover	C			X
Florida skullcap	T			X
Florida ziziphus	E			X
Four-Petal pawpaw	E			X
Fragrant prickly-apple	E			X
Fringed campion	E			X
Garber's spurge	T			X
Garrett's mint	E			X
Gentian pinkroot	E			X

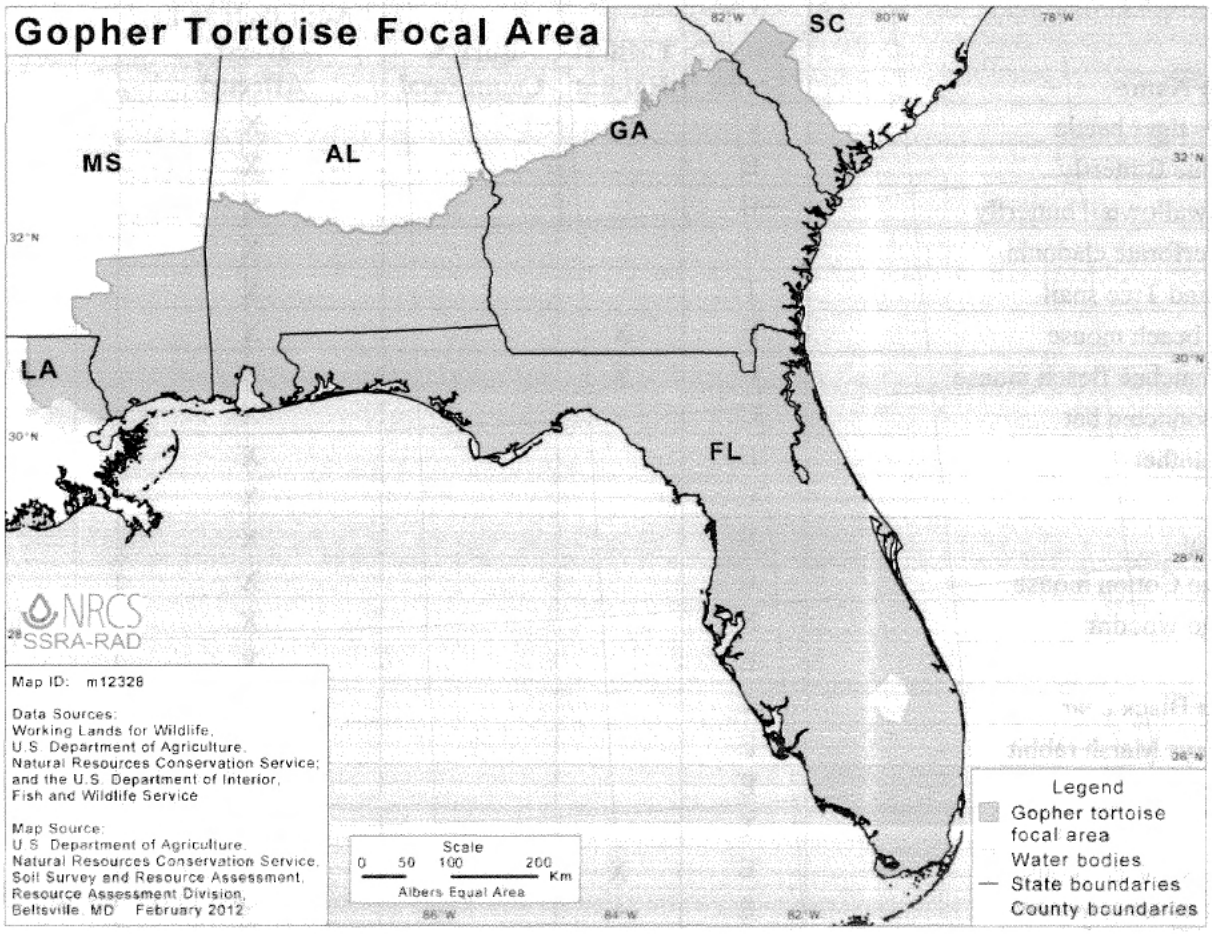
Common Name	Federal Status	Critical Habitat	Burrow Commensal	Not Likely to be Adversely Affected
Godfrey's butterwort	T			X
Hairy rattleweed	E			X
Harper's beauty	E			X
Harperella	E			X
Highlands Scrub hypericum	E			X
Johnson's seagrass	T	X		X
Key Tree cactus	E			X
Lakela's mint	E			X
Lewton's polygala	E			X
Miccosukee gooseberry	T			X
Michaux's sumac	E			X
Okeechobee gourd	E			X
Papery whitlow-wort	T			X
Pigeon wings	T			X
Pineland sandmat	C			X
Pondberry	E			X
Pygmy fringe-tree	E			X
Relict trillium	E			X
Sand flax	C			X
Sandlace	E			X
Scrub blazingstar	E			X
Scrub buckwheat	T			X
Scrub lupine	E			X
Scrub mint	E			X
Scrub plum	E			X
Short-Leaved rosemary	E			X
Small's milkpea	E			X
Smooth coneflower	E			X
Snakeroot	E			X
Telephus spurge	T			X
Tiny polygala	E			X
Wedge spurge	C			X
White birds-in-a-nest	T			X
Wide-Leaf warea	E			X
Wireweed	E			X
Bartram's Hairstreak Butterfly	C			X
Florida Leafwing Butterfly	C			X

Common Name	Federal Status	Critical Habitat	Burrow Commensal	Not Likely to be Adversely Affected
Highlands tiger beetle	C			X
Miami Blue Butterfly	E			X
Schaus Swallowtail butterfly	E			X
Florida Perforate cladonia	E			X
Stock Island Tree snail	T			X
Alabama beach mouse	E	X		X
Choctawhatchee Beach mouse	E	X		X
Florida Bonneted bat	C			X
Florida panther	E			X
Gray bat	E			X
Indiana bat	E			X
Key Largo Cotton mouse	E			X
Key Largo woodrat	E			X
Key deer	E			X
Louisiana Black bear	T			X
Lower Keys Marsh rabbit	E			X
Rice rat	E			X
Southeastern Beach mouse	T			X
St. Andrew Beach mouse	E	X		X
Alabama Red-Belly turtle	E			X
American crocodile	T	X		X
Atlantic Salt Marsh snake	T			X
Bluetail Mole skink	T			X
Ringed Map turtle	T			X
Sand skink	T			X
Yellow-Blotched Map turtle	T			X

BIOLOGICAL AND CONFERENCE OPINION

ACTION AREA

The existing range of the gopher tortoise (both the listed and candidate populations) is considered the action (focal) area. However, each state NRCS office has further refined Map 1 through priority ranking criteria and with conservation assistance from the Service in that state.



Map 1 NRCS – GT Program Action Area Map.

DESCRIPTION OF THE PROPOSED ACTION

The action for the purposes of this Opinion includes the application of certain conservation practices incorporated into NRCS conservation plans and implemented by NRCS clients in the gopher tortoise Action Area that follow the planning process and the conservation measures as described in this opinion. Twenty conservation practice standards will be implemented by NRCS under the WL4L - GT (Table 2).

Practices implemented under the WLFW – GT consist of:

1. The core conservation management practice of Upland Wildlife Habitat Management, which will be supplemented by two other core management practices, Early Successional Habitat Development/Management and Restoration and Management of Rare and Declining Habitats, for the benefit of GT and its habitat;
2. practices that facilitate the application of the core conservation management practices that, in themselves, may or may not be beneficial to GT and its habitat; and

3. practice-specific conservation measures that can avoid and minimize adverse effects of conservation practices to GT and its habitat.

Table 2. NRCS Conservation Practices Evaluated in this Opinion

Practice Name & Number Designation	Type of Conservation Practice Standard
643 - Restoration & Management of Rare & Declining Habitats	Core Management Practice
645 - Upland Wildlife Habitat Management	Core Management Practice
647 - Early Successional Habitat Development & Management	Core Management Practice
314 - Brush Management	Facilitating Management Practice
315 - Herbaceous Weed Control	Facilitating Management Practice
327 - Conservation Cover	Facilitating Management Practice
338 - Prescribed Burning	Facilitating Management Practice
394 - Fire Break	Facilitating Management Practice
490 - Tree / Shrub Site Preparation	Facilitating Management Practice
512 – Forage and Biomass Plantings	Facilitating Management Practice
528 - Prescribed Grazing	Facilitating Management Practice
550 - Range Planting	Facilitating Management Practice
595 - Integrated Pest Management	Facilitating Management Practice
612 - Tree / Shrub Establishment	Facilitating Management Practice
655 - Forest Trails and Landings	Facilitating Management Practice
382 – Fence	Facilitating Management Practice
666 - Forest Stand Improvement	Facilitating Management Practice
342 – Critical Area Planting	Facilitating Management Practice
642 – Water Well	Facilitating Management Practice
614 – Watering Facility	Facilitating Management Practice
516 – Livestock Pipeline	Facilitating Management Practice
561 – Heavy Use Area Protection	Facilitating Management Practice

This Opinion evaluates the collective effects of implementing all aspects of WLFW – GT on the GT and listed and candidate species identified in Table 1 and their supporting habitats. The analysis focuses on identified conservation practice standards NRCS has chosen to implement for the WLFW – GT. Table 2 lists those conservation practice standards evaluated in this opinion. Use of the conservation practices occurs in concert with NRCS' comprehensive conservation planning framework and creates the circumstances by which potential adverse and/or beneficial effects to the covered species can be assessed. Therefore, the evaluation and conditioning of the identified conservation practice standards for WLFW - GT is essential to achieve the expected conservation outcomes of the partnership, provide regulatory determinations on effects, and provide NRCS incidental take coverage under the ESA for any

adverse effects to any of the covered species that cannot be avoided or eliminated. For the gopher tortoise, incidental take is provided for the listed range only at this time. If the species is listed in the eastern portion of its range in the future, this Conference Report must be converted to a biological opinion for incidental take coverage to apply. The duration of this Opinion is 30 years.

The Service intends to exempt through section 7 any incidental take that is anticipated to occur from the implementation of the conservation practice standards and associated conservation measures during the WLFW contract. In addition, if a landowner voluntarily chooses to continue implementing the practices after the contract ends, the Service intends to exempt any incidental take anticipated to occur from their implementation through the 30 year period covered by this Conference Opinion.

WLFW – Gopher Tortoise (WLFW – GT) Program

On March 8, 2012, the Secretaries of Agriculture and Interior jointly announced a collaborative partnership on private lands eligible to receive Farm Bill technical and financial assistance which is expected to achieve the following objectives: (i) Restore populations of declining wildlife species. (ii) Provide farmers, ranchers, and forest managers with regulatory certainty that conservation investments they make today help sustain their operations over the long term. (iii) Strengthen and sustain rural economies by restoring and protecting the productive capacity of working lands. The partnership is collectively known as the Working Lands for Wildlife and identified seven species across the United States which would share approximately $33 million dollars of NRCS' Wildlife Habitat Incentive Program allocation for fiscal year 2012 under the 2008 Farm Bill. The gopher tortoise was one of the selected species for this partnership.

The WLFW involves a five step process:

- Joint review and conditioning of NRCS conservation practices capable of benefiting the species and removing threats;
- identification of priority target areas for habitat restoration and easement programs;
- design of ranking criteria to deliver funding where it will do the most good;
- development of a monitoring program to measure species and habitat outcomes; and
- put in place innovative mechanisms and approaches that provide improved regulatory predictability to landowners.

WLFW will target species whose decline can be reversed and will benefit other species with similar habitat needs. More information on the Working Lands for Wildlife can be found at: http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1047545.pdf.

The WLFW - GT Program is a conservation initiative based upon a targeted conservation systems approach to implement specific conservation practices to manage and enhance the species while ensuring compatibility with the private landowners' expectations for their property.

NRCS sought the Service's assistance in determining what actions will result in avoiding or minimizing potential long-term adverse effects to the gopher tortoise and the other covered species, and improve potential effectiveness of conservation practices that may result in range-wide benefits.

The implementation of the WLFW – GT Program is integrated into the daily operations of NRCS' existing Farm Bill authorities. As part of the scope of the consultation, it is therefore important for the reader to understand the NRCS' existing Conservation Planning processes and component elements that NRCS will utilize to implement this Opinion in context with delivery of the WLFW-GT. A description of the NRCS planning process is described in Appendix I and more details can be found at: http://directives.sc.egov.usda.gov/RollupViewer.aspx?hid=17014

The proposed action, the implementation of the WLFW – Gopher Tortoise Program, involves the following elements: (1) Use of Selected Conservation Practice Standards; (2) use of Wildlife Evaluation Guides which incorporate the best science to support creating desired habitat conditions; (3) incorporation of jointly developed conservation measures for the selected conservation practice standards; (4) monitoring; and (5) training.

All conservation plans developed under the WLFW – GT Program will include one or more of the core practices listed in Table 2. Executing a contract with an eligible private landowner participating in WLFW – GT Program using a core practice ensures that all other WLFW – GT Program practices where cost share is also provided (e.g., practices such as brush management, prescribed grazing, timber stand improvement, etc) are implemented specifically to benefit gopher tortoises and their habitats. Implementing the WLFW – GT Program under the core practices eliminates the possibility of using practices that benefit producers exclusively but not the gopher tortoise. For example, the Upland Wildlife Habitat Management Conservation Practice Standard (645) requires a gopher tortoise Wildlife Habitat Evaluation Guide (WHEG) be conducted and limiting factors be identified and removed or reduced. The purpose of the practice is to treat upland wildlife habitat concerns identified during the conservation planning process to: (1) Provide shelter, cover, and food in proper amounts, locations and times to sustain gopher tortoise during all phases of its life cycle, or (2) enable movement. Specific practice standards will be used by NRCS to address the limiting factors to the species and will be implemented to achieve that objective. The identification of the species' limiting factors at the individual property owner level is essential to ensure that the goals of the Upland Wildlife Habitat Management practice are being met under the WLFW – GT Program.

Core practices are critical to addressing the targeted resource concern(s) for the Initiative and achieving the desired environmental outcome(s). All conservation plans developed using WLFW – GT Program funding must include documentation that an alternative containing the core practices was presented to the decision maker. Every contract developed under the WLFW – GT Program must include one of the identified core practices. Contracts must be supported by a conservation plan that contains a core practice documented as either planned within the contract period or already applied on the land under contract.

Facilitating practices are those practices needed to make the core practices function properly or to address a specific site or condition related to the identified resource concern(s).

The following pages provide details of each of the covered Conservation Practice Standards, including its name and numerical designation, its purpose, and the associated resource concerns. Following the details is a summary table of anticipated annual Acres/feet by practice standard of gopher tortoise habitat impacted by the NRCS – GT Program (based on enrollment in FY 12).

Core Practices

The following is a summarized list of all the conservation measures that have been described and found to be necessary to avoid and minimize potential adverse affects to gopher tortoise from one or more of the core practices. The specific measures applied to each practice are further identified below.

Conservation measures:

1. Heavy equipment (including mowers) will stay at least 25ft from known gopher tortoise burrow aprons. Contact Service or state wildlife agency if assistance is needed to conduct gopher tortoise surveys. (Heavy equipment is defined as agricultural tractors, crawler loaders, crawler dozer, backhoe/loader, front end loader, scraper pan, motor grader, skid steer, forklift (P.I.T.), hydraulic excavator, and specialty tracked equipment).
2. Spraying or other control of undesirable species will be done on a "spot" or rotational basis to protect grasses, forbs and legumes that benefit native pollinators and other wildlife. If aerial treatment will be used on Service classified priority or suitable gopher tortoise soils and the treatment area is larger than 25 acres, the Area Biologist should be contacted for further assistance.
3. Regularly monitor the site after implementation to ensure erosion and undesirable plant species issues are addressed quickly.
4. Design the practice to minimize or avoid unintentional damage to non-target plants.
5. Defer implementation of the conservation practice within 25 feet to known burrows and nest sites until all nesting activities are completed, typically August to October, or as modified by State Wildlife Agency or State Technical Committee recommendations.
6. Woody slash shall be treated if significant buildup of fuels occurs. Slash piles shall be burned when wildfire risk is low (usually when soils are frozen or saturated). Follow state forestry laws, when applicable, for treating slash to minimize wildfire risk.
7. Use site specific reclamation strategies using ecological site descriptions or the recommendations of the state biologist. Native species will be used wherever possible to meet practice objectives with preference to forbs, grasses and grass-like plants to meet gopher tortoise needs. Seed mixes should be State-certified, meeting the appropriate State certification criteria as being free of state declared noxious and invasive material.
8. Burn on two year rotation with occasional three year burns due to weather limitations. If an occasional burn is done on a three year interval, then a growing season burns should be used to set back hardwoods and stimulate seeding of wire grass.
9. A minimum of 2.5 acres of gopher tortoise foraging habitat should be maintained around a burrow at all times and not be permanently converted, removed, or degraded by any means (e.g. clearing, trampling, flooding). Clearing of gopher tortoise habitat should be minimized and restored as soon as possible when such clearing is temporary. Scrub-shrub habitat may be permanently or temporarily removed without adversely affecting gopher tortoise.
10. The practice shall not be implemented using the "bedding" technique - a mechanical means of site preparation that mounds the soil in narrow strips for tree planting.
11. Roller chopping should be limited to single pass with single roller.
12. Herbicide should be restricted to herbicides that would have the least affect on the seed bank but still provides the control of competition needed. Herbicides should be used at the lower rates/ac for the soil texture.
13. The installation of the practice shall not impede the movement of the gopher tortoise.
14. Native warm season grasses shall be exclusively planted (CP 512 only).

15. Fields should not be overgrazed, but maintain a minimum of 6 in growth of native warm season grasses.
16. Stocking densities and species of trees/shrubs shall be consistent with gopher tortoise habitat needs – this varies by state. As recommended by each states technical committee.
17. Avoid placement of slash over gopher tortoise burrows.
18. Typical fencing will have a minimum of 30 cm clearance from ground, electric fence will have a minimum of 40 cm, and woven fencing a minimum 30 cm by 30 cm with a hole every 100 ft.
19. Whenever possible, native species will be used to meet practice objectives with preference to forbs, grasses and grass-like plants preferred by gopher tortoise.
20. Where possible, avoid gopher tortoise suitable soils (CP 516 only).

Conservation Practice Standard: Restoration & Management of Rare & Declining Habitats (643)

Definition: Restoring, conserving, and managing unique or diminishing native terrestrial and aquatic ecosystems.

Purpose: To return aquatic or terrestrial ecosystems to their original or usable and functioning condition and to improve biodiversity by providing and maintaining habitat for fish and wildlife species associated with the ecosystem.

Application: This practice will be a core practice in which a system of supporting practices will be applied to restore and manage rare and declining habitats and their associated wildlife species to conserve biodiversity. This practice may be utilized in those areas or states where gopher tortoise has been identified to occur in an identified rare or declining habitat(s).

Potential Adverse Effect(s) to Gopher Tortoise: Temporary soil disturbance, vegetation removal and increased potential of introduction of invasive plants. Increased potential of accidental mortality or injury to individuals.

Conservation measures: Heavy equipment (including mowers) will stay at least 25ft from known gopher tortoise burrow aprons. Contact Service or state wildlife agency if assistance is needed to conduct gopher tortoise surveys.

Potential Beneficial Effect(s) to the gopher tortoise: This core management practice will be used to restore, enhance or create, and manage for suitable habitat for the gopher tortoise; to improve habitat conditions for all life cycles, including breeding and nesting, and to provide adequate food, cover and shelter, and address the effects of habitat fragmentation by creating, maintaining, or restoring landscape connectivity for movement.

Conservation Practice Standard: Upland Wildlife Habitat Management (645)

Definition: Provide and manage upland habitats and connectivity within the landscape for wildlife.

Purpose: Treating upland wildlife habitat concerns identified during the conservation planning process that enable movement, or provide shelter, cover, food in proper amounts, locations and times to sustain wild animals that inhabit uplands during a portion of their life cycle.

Application: This practice will be a core practice in which a system of supporting practices will be applied to benefit the gopher tortoise. It involves the treatment of habitat components identified during the conservation planning process that enable movement, or provide shelter, cover, and food in proper amounts, locations and times to sustain wild animals that inhabit uplands during a portion of their life cycle.

Potential Adverse Effect(s) to Gopher Tortoise: Temporary soil disturbance, vegetation removal and increased potential of introduction of invasive plants. Permanent removal/loss of suitable habitat. Increased potential of accidental mortality or injury to individuals.

Conservation Measures:

1. Heavy equipment (including mowers) will stay at least 25ft from known gopher tortoise burrow aprons. Contact Fish and Wildlife Service staff or state wildlife agency if assistance is needed to conduct gopher tortoise surveys.

Potential Beneficial Effect(s) to the gopher tortoise: This core management practice will be used to restore, enhance or create, and manage for suitable habitat for the gopher tortoise; to improve habitat conditions for all life cycles, including breeding and nesting, and to provide adequate food, cover and shelter, and address the effects of habitat fragmentation by creating, maintaining, or restoring landscape connectivity for movement.

Conservation Practice Standard: Early Successional Habitat Development/Management (647)

Definition: Manage plant succession to develop and maintain early successional habitat to benefit desired wildlife and/or natural communities.

Purpose: To provide habitat for species requiring early successional habitat for all or part of their life cycle.

Application: This practice will be a core practice in which a system of supporting practices will be applied to benefit the gopher tortoise. It involves the treatment of habitat components identified during the conservation planning process that will produce and manage vegetative conditions at early successional stages to support the gopher tortoise during all or part of its life cycle.

Potential Adverse Effect(s) to Gopher Tortoise: Temporary soil disturbance, vegetation removal and increased potential of introduction of invasive plants. Permanent removal/loss of suitable habitat. Increased potential of accidental mortality or injury to individuals.

Conservation Measures:

1. Heavy equipment (including mowers) will stay at least 25ft from known gopher tortoise burrow aprons. Contact Fish and Wildlife Service staff or state wildlife agency if assistance is needed to conduct gopher tortoise surveys.
2. **Potential Beneficial Effect(s) to the gopher tortoise:** This core management practice will be used to restore, enhance or create, and manage for suitable habitat for the gopher tortoise; to improve habitat conditions for all life cycles, including breeding and nesting, and to provide adequate food,

cover and shelter, and address the effects of habitat fragmentation by creating, maintaining, or restoring landscape connectivity for movement.

Supporting Practices

Conservation Practice Standard: Brush Management (314)

Definition: The management or removal of woody (non-herbaceous or succulent) plants including those that are invasive and noxious.

Purposes: (1) Create the desired plant community consistent with the ecological site. (2) Restore or release desired vegetative cover to protect soils, control erosion, reduce sediment, improve water quality or enhance stream flow. (3) Maintain, modify, or enhance fish and wildlife habitat. (4) Improve forage accessibility, quality and quantity for livestock and wildlife. (5) Manage fuel loads to achieve desired conditions.

Application: This practice will be a supporting practice to a core practice. This practice will maintain, modify, or enhance wildlife habitat for gopher tortoise and create desired vegetation cover.

Potential Adverse Effect(s) to Gopher Tortoise: Temporary soil disturbance, vegetation removal and increased potential of introduction of invasive plants. Permanent removal/loss of suitable habitat. Increased potential of accidental mortality or injury to individuals.

Conservation Measures:

1. Heavy equipment (including mowers) will stay at least 25ft from known gopher tortoise burrow aprons. Contact Service or state wildlife agency if assistance is needed to conduct gopher tortoise surveys.
2. Spraying or other control of undesirable species will be done on a "spot" or rotational basis to protect grasses, forbs and legumes that benefit native pollinators and other wildlife. If aerial treatment will be used on Sevice classified priority or suitable gopher tortoise soils and the treatment area is larger than 25 acres, the Area Biologist should be contacted for further assistance.
3. Regularly monitor the site after implementation to ensure erosion and undesirable plant species issues are addressed quickly.
4. Design the practice to minimize or avoid unintentional damage to non-target plants.
5. Defer implementation of this conservation practice within 25 feet to known burrows and nest sites until all nesting activities are completed, typically August to October, or as modified by State Wildlife Agency or State Technical Committee recommendations.
6. Woody slash shall be treated if significant buildup of fuels occurs. Slash piles shall be burned when wildfire risk is low (usually when soils are frozen or saturated). Follow state forestry laws, when applicable, for treating slash to minimize wildfire risk.

Potential Beneficial Effect(s) to the gopher tortoise: Removal of a limiting habitat factor (hardwood midstory) and creation of desired or targeted habitat conditions (diverse and abundant understory vegetation).

Conservation Practice Standard: Herbaceous Weed Control (315)

Definition: The removal or control of herbaceous weeds including invasive, noxious and prohibited plants.

Purposes: (1) Enhance accessibility, quantity, and quality of forage and/or browse. (2) Restore or release native or create desired plant communities and wildlife habitats consistent with the ecological site. (3) Protect soils and control erosion. (4) Reduce fine-fuels fire hazard and improve air quality.

Application: The practice will be used to support a core management practice and may be cost shared in conjunction with prescribed burning (338) to address remaining and/or emergent herbaceous weeds considered obnoxious, invasive, or undesirable to support the desired habitat conditions. Practice implementation removes or reduces invasive or other weed species that directly or indirectly limit gopher tortoise habitat quality and productivity.

Potential Adverse Effect(s) to Gopher Tortoise: Temporary soil disturbance, vegetation removal and increased potential of introduction of invasive plants. Increased potential of accidental mortality or injury to individuals.

Conservation Measures:

1. Heavy equipment (including mowers) will stay at least 25ft from known gopher tortoise burrow aprons. Contact Service or state wildlife agency if assistance is needed to conduct gopher tortoise surveys.
2. Spraying or other control of undesirable species will be done on a "spot" or rotational basis to protect grasses, forbs and legumes that benefit native pollinators and other wildlife. If aerial treatment will be used on Service classified priority or suitable gopher tortoise soils and the treatment area is larger than 25 acres, the Area Biologist should be contacted for additional assistance.

Potential Beneficial Effect(s) to the gopher tortoise: Practice implementation removes or reduces invasive or other weed species that directly or indirectly limit gopher tortoise habitat quality and productivity. Practice can beneficially influence the vigor and establishment of native or desirable vegetation required to provide gopher tortoise habitat.

Conservation Practice Standard: Conservation Cover (327)

Definition: Establishing and maintaining permanent vegetative cover.

Purposes: This practice may be applied to accomplish one or more of the following: (1) Reduce soil erosion and sedimentation. (2) Improve water quality. (3) Improve air quality. (4) Enhance wildlife habitat and pollinator habitat. (5) Improve soil quality. (6) Manage plant pests.

Application: Practice will involve planting of native grasses and forbs in areas where enhancements are necessary to promote quality gopher tortoise habitat conditions.

Potential Adverse Effect(s) to Gopher Tortoise: Temporary soil disturbance, vegetation removal and increased potential of introduction of invasive plants. Increased potential of accidental mortality or injury to individuals.

Conservation Measures:

1. Heavy equipment (including mowers) will stay at least 25ft from known gopher tortoise burrow aprons. Contact Service or state wildlife agency if assistance is needed to conduct gopher tortoise surveys.
2. Use site specific reclamation strategies using ecological site descriptions or the recommendations of the state biologist. Native species will be used wherever possible to meet practice objectives with preference to forbs, grasses and grass-like plants to meet gopher tortoise needs. Seed mixes should be State-certified, meeting the appropriate State certification criteria as being free of state declared noxious and invasive material.

Potential Beneficial Effect(s) to the gopher tortoise: Practice implementation will provide additional forage and cover habitat, potentially also re-connecting fragmented habitat patches.

Conservation Practice Standard: Prescribed Burning (338)

Definition: Controlled fire applied to a predetermined area.

Purposes: (1) Control undesirable vegetation. (2) Prepare sites for harvesting, planting or seeding. (3) Control plant disease. (4) Reduce wildfire hazards. (5) Improve wildlife habitat. (6) Improve plant production quantity and/or quality. (7) Remove slash and debris. (8) Enhance seed and seedling production. (9) Facilitate distribution of grazing and browsing animals. (10) Restore and maintain ecological sites.

Application: This practice will be a supporting practice to a core practice. This practice will create the desired plant community phase consistent with the ecological site description that is preferable gopher tortoise habitat. Actions may include: (a) Control undesirable vegetation or to manipulate desired vegetation; (b) prepare sites for planting or seeding; (c) manipulate vegetation to reduce wildfire hazards; (d) improve wildlife habitat specifically enhance and produce desirable or needed plant communities for all phases of gopher tortoise life cycle; (e) improve forage production quantity and/or quality; and/or (f) restore and/or maintain ecological sites.

Potential Adverse Effect(s) to Gopher Tortoise: Temporary soil disturbance, vegetation removal and increased potential of introduction of invasive plants. Increased potential of accidental mortality or injury to individuals.

Conservation Measures: Burn on two year rotation with occasional three year burns due to weather limitations. If an occasional burn is done on a three year interval, then a growing season burns should be used to set back hardwoods and stimulate seeding of wire grass.

Potential Beneficial Effect(s) to the gopher tortoise: Prescribed burning is one of the most important management tools for creating or maintaining gopher tortoise habitat. Prescribed burning shapes the forest structure and composition, providing desired gopher tortoise habitat conditions. Target areas and

defined objective(s) will be clearly stated with intended goals to be addressed for each client defined management unit.

Conservation Practice Standard: Fire Break (394)

Definition: A permanent or temporary strip of bare or vegetated land planned to retard fire.

Purposes: (1) Reduce the spread of wildfire. (2) Contain prescribed burns.

Application: This practice will be a supporting practice to a core practice and to enhance the effectiveness of the prescribed burn (338) practice standard.

Potential Adverse Effect(s) to Gopher Tortoise: Temporary soil disturbance, vegetation removal and increased potential of introduction of invasive plants. Permanent removal/loss of suitable habitat. Increased potential of accidental mortality or injury to individuals.

Conservation Measures:

1. Heavy equipment (including mowers) will stay at least 25ft from known gopher tortoise burrow aprons. Contact Services or state wildlife agency if assistance is needed to conduct gopher tortoise surveys.
2. A minimum of 2.5 acres of gopher tortoise foraging habitat should be maintained around a burrow at all times and not be permanently converted, removed, or degraded by any means (e.g. clearing, trampling, flooding). Clearing of gopher tortoise habitat should be minimized and restored as soon as possible when such clearing is temporary. Scrub-shrub habitat may be permanently or temporarily removed without adversely affecting gopher tortoise.
3. The installation of this practice shall not impede the movement of the gopher tortoise.

Potential Beneficial Effect(s) to the gopher tortoise: Practice can help reduce the spread of wildfires thus reducing the risk of large-scale, habitat loss. Firebreaks can provide foraging areas by stimulating forb growth.

Conservation Practice Standard: Tree / Shrub Site Preparation (490)

Definition: Treatment of areas to improve site conditions for establishing trees and/or shrubs.

Purposes: (1) Encourage natural regeneration of desirable woody plants. (2) Permit artificial establishment of woody plants.

Application: Practice will be a supporting practice to a core practice.

Potential Adverse Effect(s) to Gopher Tortoise: Temporary soil disturbance, vegetation removal and increased potential of introduction of invasive plants. Increased potential of accidental mortality or injury to individuals.

Conservation Measures:

1. Heavy equipment (including mowers) will stay at least 25ft from known gopher tortoise burrow aprons. Contact USFWS or state wildlife agency if assistance is needed to conduct gopher tortoise surveys.
2. A minimum of 2.5 acres of gopher tortoise foraging habitat should be maintained around a burrow at all times and not be permanently converted, removed, or degraded by any means (e.g. clearing, trampling, flooding). Clearing of gopher tortoise habitat should be minimized and restored as soon as possible when such clearing is temporary. Scrub-shrub habitat may be permanently or temporarily removed without adversely affecting gopher tortoise.
3. The practice shall not be implemented using the "bedding" technique - a mechanical means of site preparation that mounds the soil in narrow strips for tree planting, root raking, and KG.
4. Roller chopping should be limited to single pass with single roller.
5. Herbicide should be restricted to herbicides that would have the least affect on the seed bank but still provides the control of completion needed. Herbicides should be used at the lower rates/ac for the soil texture.

Potential Beneficial Effect(s) to the gopher tortoise:

Conservation Practice Standard: Forage & Biomass Plantings (512)

Definition: Establishing adapted and/or compatible species, varieties, or cultivars of herbaceous species suitable for pasture, hay, or biomass production.

Purposes: (1) Improve or maintain livestock nutrition and/or health. (2) Provide or increase forage supply during periods of low forage production. (3) Reduce soil erosion. (4) Improve soil and water quality. (5) Produce feedstock for biofuel or energy production.

Application: Practice will involve planting of native grasses and forbs in areas where enhancements are necessary to promote quality gopher tortoise habitat conditions. Note: this practice is used for "Range Planting" on non-range sites.

Potential Adverse Effect(s) to Gopher Tortoise:

Conservation Measures:

1. As indicated by the anticipated acreage use by state, this is a limited use practice.
2. Native warm season grasses should be exclusively planted.
3. Heavy equipment (including mowers) will stay at least 25ft from known gopher tortoise burrow aprons. Contact Service or state wildlife agency if assistance is needed to conduct gopher tortoise surveys.
4. A minimum of 2.5 acres of gopher tortoise foraging habitat should be maintained around a burrow at all times and not be permanently converted, removed, or degraded by any means (e.g. clearing, trampling, flooding). Clearing of gopher tortoise habitat should be minimized and restored as soon as possible when such clearing is temporary. Scrub-shrub habitat may be permanently or temporarily removed without adversely affecting gopher tortoise.
5. Spraying or other control of undesirable species will be done on a "spot" or rotational basis to protect grasses, forbs and legumes that benefit native pollinators and other wildlife. If aerial

treatment will be used on Service classified priority or suitable gopher tortoise soils and the treatment area is larger than 25 acres, the Area Biologist will be contacted for additional assistance.

Potential Beneficial Effect(s) to the gopher tortoise:

Conservation Practice Standard: Prescribed Grazing (528)

Definition: Managing the harvest of vegetation with grazing and/or browsing animals.

Purpose: This practice may be applied as a part of conservation management system to achieve one or more of the following: (1) Improve or maintain desired species composition and vigor of plant communities. (2) Improve or maintain quantity and quality of forage for grazing and browsing animals' health and productivity. (3) Improve or maintain surface and/or subsurface water quality and quantity. (4) Improve or maintain riparian and watershed function. (5) Reduce accelerated soil erosion, and maintain or improve soil condition. (6) Improve or maintain the quantity and quality of food and/or cover available for wildlife. (7) Manage fine fuel loads to achieve desired conditions.

Application: This practice will be a supporting practice to a core practice. This practice will create desired vegetation cover consistent with the ecological site; maintain, modify, or enhance wildlife habitat for gopher tortoise.

Potential Adverse Effect(s) to Gopher Tortoise: Temporary soil disturbance, vegetation removal and increased potential of introduction of invasive plants.

Conservation Measures:

1. Fields should not be overgrazed, but maintain a minimum of six inch growth of native warm season grasses.

Potential Beneficial Effect(s) to the gopher tortoise: Prescribed grazing provides a de minimus direct benefit to the gopher tortoise by precluding successional overgrowth of gopher tortoise habitat.

Conservation Practice Standard: Range Planting (550)

Definition: Establishment of adapted perennial or self-sustaining vegetation such as grasses, forbs, legumes, shrubs and trees.

Purposes: (1) Restore a plant community similar to the Ecological Site Description reference state for the site or the desired plant community. (2) Provide or improve forages for livestock. (3) Provide or improve forage, browse or cover for wildlife. (4) Reduce erosion by wind and/or water. (5) Improve water quality and quantity. (6) Increase carbon sequestration.

Application: This practice will be a supporting practice to a core practice. Practice will involve planting of native grasses and forbs in areas where enhancements are necessary to promote quality gopher tortoise habitat conditions.

Potential Adverse Effect(s) to Gopher Tortoise: Increased potential of accidental mortality or injury to individuals.

Conservation Measures:

1. Heavy equipment (including mowers) will stay at least 25ft from known gopher tortoise burrow aprons. Contact Service or state wildlife agency if assistance is needed to conduct gopher tortoise surveys.
2. A minimum of 2.5 acres of gopher tortoise foraging habitat should be maintained around a burrow at all times and not be permanently converted, removed, or degraded by any means (e.g. clearing, trampling, flooding). Clearing of gopher tortoise habitat should be minimized and restored as soon as possible when such clearing is temporary. Scrub-shrub habitat may be permanently or temporarily removed without adversely affecting gopher tortoise.
3. Spraying or other control of undesirable species will be done on a "spot" or rotational basis to protect grasses, forbs and legumes that benefit native pollinators and other wildlife. If aerial treatment will be used on Service classified priority or suitable gopher tortoise soils and the treatment area is larger than 25 acres, contact the Area Biologist for assistance.

Potential Beneficial Effect(s) to the gopher tortoise: Provide native herbaceous forage.

Conservation Practice Standard: Tree / Shrub Establishment (612)

Definition: Establishing woody plants by planting seedlings or cuttings, direct seeding, or natural regeneration.

Purpose: Establish woody plants for: (1) Forest products such as timber, pulpwood, etc.; (2) wildlife habitat; (3) long-term erosion control and improvement of water quality; (4) treating waste; (5) storing carbon in biomass; (6) reduce energy use; (7) develop renewable energy systems; (8) improving or restoring natural diversity; (9) enhancing aesthetics.

Application: This practice will be a supporting practice to a core practice. Practice will involve planting of longleaf pine or, in Florida, slash pine where appropriate to promote quality gopher tortoise habitat conditions.

Potential Adverse Effect(s) to Gopher Tortoise: Temporary soil disturbance, vegetation removal and increased potential of introduction of invasive plants. Increased potential of accidental mortality or injury to individuals.

Conservation Measures:

1. Heavy equipment (including mowers) must stay at least 25ft from burrow aprons. Contact Service or state wildlife agency if assistance is needed to conduct gopher tortoise surveys. Stocking density and species shall be consistent with gopher tortoise habitat needs – this varies by state. As recommended by the state technical committee.

Note: Ranking criteria will ensure that longleaf pine and south Florida slash pine will be the only contracts that rank highly enough to receive funding.

Potential Beneficial Effect(s) to the gopher tortoise: Establish low density longleaf pine and the potential to reintroduce prescribed fire to the ecosystem. Provide fuel for prescribed burning.

Conservation Practice Standard: Forest Harvest Trails & Landings (655)

Definition: A temporary or infrequently used route, path or cleared area.

Purposes: (1) Provide routes for temporary or infrequent travel by people or equipment for management activities. (2) Provide periodic access for removal and collection of forest products.

Application: This practice will be a supporting practice to a core practice. Practice involves providing routes for temporary or infrequent travel by people or equipment for forestry management activities.

Potential Adverse Effect(s) to Gopher Tortoise: Temporary soil disturbance, vegetation removal and increased potential of introduction of invasive plants. Increased potential of accidental mortality or injury to individuals.

Conservation Measures:
1. Avoid placement of slash over gopher tortoise burrows.
2. Heavy equipment (including mowers) must stay at least 25ft from burrow aprons. Contact Service or state wildlife agency if assistance is needed to conduct gopher tortoise surveys.
3. A minimum of 2.5 acres of gopher tortoise foraging habitat should be maintained around a burrow at all times and not be permanently converted, removed, or degraded by any means (e.g. clearing, trampling, flooding). Clearing of gopher tortoise habitat should be minimized and restored as soon as possible when such clearing is temporary. Scrub-shrub habitat may be permanently or temporarily removed without adversely affecting gopher tortoise.

Potential Beneficial Effect(s) to the gopher tortoise: Planting of native warm season grasses/forbs will provide food for gopher tortoise.

Conservation Practice Standard: Fence (382)

Definition: A constructed barrier to animals or people.

Purpose: This practice facilitates the accomplishment of conservation objectives by providing a means to control movement of animals and people, including vehicles.

Application: This practice will be a supporting practice to a core practice. Practice involves constructing a barrier to manage grazing animals and/or people.

Potential Adverse Effect(s) to Gopher Tortoise: Temporary soil disturbance, vegetation removal and increased potential of introduction of invasive plants. Permanent removal/loss of suitable habitat. Increased potential of accidental mortality or injury to individuals.

Conservation Measures:

1. Heavy equipment (including mowers) must stay at least 25ft from burrow aprons. Contact Service or state wildlife agency if assistance is needed to conduct gopher tortoise surveys.
2. Typical fence will have minimum 30 cm clearance from ground, electric fence 40 cm clearance, and woven fencing 30cm x 30cm with a hole every 100ft.

Potential Beneficial Effect(s) to the gopher tortoise: Fencing out livestock and/or people will allow for restoration of trampled and overgrazed habitat.

Conservation Practice Standard: Forest Stand Improvement (666)

Definition: The manipulation of species composition, stand structure and stocking by cutting or killing selected trees and understory vegetation.

Purposes: (1) Increase the quantity and quality of forest products by manipulating stand density and structure. (2) timely harvest of forest products; (3) development of renewable energy systems; (4) initiate forest stand regeneration; (5) reduce wildfire hazard; (6) improve forest health reducing the potential of damage from pests and moisture stress; (7) restore natural plant communities; (8) achieve or maintain a desired native understory plant community for special forest products, grazing, and browsing; (9) improve aesthetic and recreation, values; (10) improve wildlife habitat; (11) alter water yield; and (12) increase carbon storage in selected trees.

Application: This practice will be a supporting practice to a core practice. This practice will create desired tree and mid-story conditions consistent with the ecological site; maintain, modify, or enhance wildlife habitat for gopher tortoise.

Potential Adverse Effect(s) to Gopher Tortoise: Temporary soil disturbance, vegetation removal and increased potential of introduction of invasive plants. Increased potential of accidental mortality or injury to individuals.

Conservation Measures:

1. Heavy equipment (including mowers) will stay at least 25ft from known gopher tortoise burrow aprons. Contact Service or state wildlife agency if assistance is needed to conduct gopher tortoise surveys.
2. Spraying or other control of undesirable species will be done on a "spot" or rotational basis to protect grasses, forbs and legumes that benefit native pollinators and other wildlife. If aerial treatment will be used on Service classified priority or suitable gopher tortoise soils and the treatment area is larger than 25 acres, the Area Biologist should be contacted for further assistance.
3. Regularly monitor the site after implementation to ensure erosion and undesirable plant species issues are addressed quickly.
4. Design the practice to minimize or avoid unintentional damage to non-target plants.
5. Defer implementation of this conservation practice within 25 feet to known burrows and nest sites until all nesting activities are completed, typically August to October, or as modified by State Wildlife Agency or State Technical Committee recommendations.
6. Woody slash shall be treated if significant buildup of fuels occurs. Slash piles shall be burned when wildfire risk is low (usually when soils are frozen or saturated). Follow state forestry laws, when applicable, for treating slash to minimize wildfire risk.

Potential Beneficial Effect(s) to the gopher tortoise:

Conservation Practice Standard: Critical Area Planting (342)

Definition: Establishing permanent vegetation on sites that have, or are expected to have, high erosion rates, and on sites that have physical, chemical or biological conditions that prevent the establishment of vegetation with normal practices.

Purposes: (1) Stabilize stream and channel banks, and shorelines; (2) stabilize areas with existing or expected high rates of soil erosion by wind or water; (3) rehabilitate and revegetate degraded sites that cannot be stabilized using normal establishment techniques; and (4) stabilize coastal areas, such as sand dunes and riparian areas.

Application: Practice will involve planting of native grasses and forbs in areas where enhancements are necessary to promote quality gopher tortoise habitat conditions.

Potential Adverse Effect(s) to Gopher Tortoise: None

Conservation Measure:

1. Whenever possible, native species will be used to meet practice objectives with preference to forbs, grasses and grass-like plants preferred by gopher tortoise.

Potential Beneficial Effect(s) to the gopher tortoise:
Establishment of permanent vegetation can provide stability in the ecosystem by improving soil quality, preventing erosion and providing forage for gopher tortoise.

Conservation Practice Standard: Water Well (642)

Definition: A hole drilled, dug, driven, bored, jetted or otherwise constructed to an aquifer for water supply.

Purposes: (1) Provide water for livestock, wildlife, irrigation, and other agricultural uses; (2) facilitate proper use of vegetation, such as keeping animals on rangeland and pastures and away from streams, and providing water for wildlife.

Application: This practice will be a supporting practice to a core practice. This practice will facilitate the creation of a grazing management system.

Potential Adverse Effect(s) to Gopher Tortoise: Temporary soil disturbance, vegetation removal and increased potential of introduction of invasive plants. Permanent removal/loss of suitable habitat. Increased potential of accidental mortality or injury to individuals.

Conservation measures:

1. Heavy equipment (including mowers) must stay at least 25ft from burrow aprons. Contact Service or state wildlife agency if assistance is needed to conduct gopher tortoise surveys.

2. A minimum of 2.5 acres of gopher tortoise foraging habitat should be maintained around a burrow at all times and not be permanently converted, removed, or degraded by any means (e.g. clearing, trampling, flooding). Clearing of gopher tortoise habitat should be minimized and restored as soon as possible when such clearing is temporary. Scrub-shrub habitat may be permanently or temporarily removed without adversely affecting gopher tortoise.
3. Whenever possible, native species will be used to meet practice objectives with preference to forbs, grasses and grass-like plants preferred by gopher tortoise.

Potential Beneficial Effect(s) to the gopher tortoise:

Conservation Practice Standard: Watering Facility (614)

Definition: A permanent or portable device to provide an adequate amount and quality of drinking water for livestock and or wildlife.

Purpose: To provide access to drinking water for livestock and/or wildlife in order to: (1) Meet daily water requirements; and (2) improve animal distribution.

Application: This practice will be a supporting practice to a core practice. This practice will facilitate the creation of a grazing management system.

Potential Adverse Effect(s) to Gopher Tortoise: Temporary soil disturbance, vegetation removal and increased potential of introduction of invasive plants. Permanent removal/loss of suitable habitat. Increased potential of accidental mortality or injury to individuals.

Conservation measures:
1. Heavy equipment (including mowers) must stay at least 25ft from burrow aprons. Contact Service or state wildlife agency if assistance is needed to conduct gopher tortoise surveys.
2. A minimum of 2.5 acres of gopher tortoise foraging habitat should be maintained around a burrow at all times and not be permanently converted, removed, or degraded by any means (e.g. clearing, trampling, flooding). Clearing of gopher tortoise habitat should be minimized and restored as soon as possible when such clearing is temporary. Scrub-shrub habitat may be permanently or temporarily removed without adversely affecting gopher tortoise.
3. Whenever possible, native species will be used to meet practice objectives with preference to forbs, grasses and grass-like plants preferred by gopher tortoise.
4. Where possible, avoid gopher tortoise suitable soils.

Potential Beneficial Effect(s) to the gopher tortoise:

Conservation Practice Standard: Livestock Pipeline (516)

Definition: A pipeline and appurtenances installed to convey water for livestock or wildlife.

Purpose: This practice may be applied as part of a resource management system to achieve one or more of the following purposes: (1) Convey water to points of use for livestock or wildlife; (2) reduce energy use; and/or (3) develop renewable energy systems.

Application: This practice will be a supporting practice to a core practice. This practice will facilitate the creation of a grazing management system.

Potential Adverse Effect(s) to Gopher Tortoise: Temporary soil disturbance, vegetation removal and increased potential of introduction of invasive plants. Permanent removal/loss of suitable habitat. Increased potential of accidental mortality or injury to individuals.

Conservation measures:

1. Heavy equipment (including mowers) must stay at least 25ft from burrow aprons. Contact Service or state wildlife agency if assistance is needed to conduct gopher tortoise surveys.
2. A minimum of 2.5 acres of gopher tortoise foraging habitat should be maintained around a burrow at all times and not be permanently converted, removed, or degraded by any means (e.g. clearing, trampling, flooding). Clearing of gopher tortoise habitat should be minimized and restored as soon as possible when such clearing is temporary. Scrub-shrub habitat may be permanently or temporarily removed without adversely affecting gopher tortoise.
3. Whenever possible, native species will be used to meet practice objectives with preference to forbs, grasses and grass-like plants preferred by gopher tortoise.
4. Where possible, avoid gopher tortoise suitable soils.

Potential Beneficial Effect(s) to the gopher tortoise:

Conservation Practice Standard: Heavy Use Area Protection (561)

Definition: The stabilization of areas frequently and intensively used by people, animals or vehicles by establishing vegetative cover, surfacing with suitable materials, and/or installing needed structures.

Purposes: (1) To provide a stable, non-eroding surface for areas frequently used by animals, people or vehicles; and/or (2) to protect and improve water quality.

Application: This practice will be a supporting practice to a core practice. This practice will facilitate the creation of a grazing management system.

Potential Adverse Effect(s) to Gopher Tortoise: Temporary soil disturbance, vegetation removal and increased potential of introduction of invasive plants. Permanent removal/loss of suitable habitat. Increased potential of accidental mortality or injury to individuals.

Conservation measures:

1. Avoid or minimize concentration of livestock in occupied habitat and where possible avoid gopher tortoise suitable soils.
2. Heavy equipment (including mowers) must stay at least 25ft from burrow aprons. Contact Service or state wildlife agency if assistance is needed to conduct gopher tortoise surveys.
3. A minimum of 2.5 acres of gopher tortoise foraging habitat should be maintained around a burrow at all times and not be permanently converted, removed, or degraded by any means (e.g. clearing, trampling, flooding). Clearing of gopher tortoise habitat should be minimized and restored as soon

as possible when such clearing is temporary. Scrub-shrub habitat may be permanently or temporarily removed without adversely affecting gopher tortoise.
4. Whenever possible, native species will be used to meet practice objectives with preference to forbs, grasses and grass-like plants preferred by gopher tortoise.

Potential Beneficial Effect(s) to the gopher tortoise:

Conservation Practice Standard: Integrated Pest Management (595)

Definition: A site-specific combination of pest prevention, pest avoidance, pest monitoring, and pest suppression strategies.

Purposes: To prevent or mitigate: (1) Offsite pesticide risks to water quality from leaching, solution runoff, and adsorbed runoff losses; (2) offsite pesticide risks to soil, water, air, plants, animals and humans from drift and volatilization losses; on-site pesticide risks to pollinators and other beneficial species through direct control and; (4) cultural, mechanical and biological pest suppression risks to soil, water, air, plants, animals and humans.

Application: This practice will be a supporting practice to a core practice.

Potential Adverse Effect(s) to Gopher Tortoise: Temporary soil disturbance and vegetation removal.

Conservation measures:
1. Heavy equipment (including mowers) will stay at least 25ft from known gopher tortoise burrow aprons. Contact Service or state wildlife agency if assistance is needed to conduct gopher tortoise surveys.
2. Spraying or other control of undesirable species will be done on a "spot" or rotational basis to protect grasses, forbs and legumes that benefit native pollinators and other wildlife. If aerial treatment will be used on Service classified priority or suitable gopher tortoise soils and the treatment area is larger than 25 acres, the Area Biologist should be contacted for further assistance.
3. Regularly monitor the site after implementation to ensure erosion and undesirable plant species issues are addressed quickly.
4. Design the practice to minimize or avoid unintentional damage to non-target plants.

Potential Beneficial Effect(s) to the gopher tortoise: Practice implementation prevents invasive or other weed species that directly or indirectly limit gopher tortoise habitat quality and productivity. Practice can beneficially influence the vigor and establishment of native or desirable vegetation required to provide gopher tortoise habitat.

Table 3. Anticipated Annual Acres/Feet by Practice Standard of Gopher Tortoise Habitat Impacted by the NRCS – GT Program (Based on Enrollment in FY 12).

	AL	FL	GA	LA	MS	SC	Totals
WHEG?		Y	N	N	N	Y	
Anticipated Avg. Contract Period	**3 yrs**	**5 yrs**	**4 yrs**	**5 yrs**	**2 yrs**	**5 yrs**	
Conservation Practice Standards	**Amounts by State**						
314 - Brush Management (acres)		2100	500			316	**2916**
315 - Herbaceous Weed Control (acres)	1085	370	500	100	1000		**3055**
327 - Conservation Cover (acres)				100			**100**
338 - Prescribed Burning (acres)	35650	6835	25000	40000	1500	796	**109781**
342 – Critical Area Planting (acres)							
382 – Fence (feet)		130000				1500	**131500**
394 - Fire Break (feet)		290000		5000	1250		**296250**
490 - Tree / Shrub Site Preparation (acres)	7905	1395	10000	10000		280	**29580**
516 – Livestock Pipeline (feet)		10000					**10000**
528 - Prescribed Grazing (acres)		4000	100				**4100**
550 - Range Planting (acres)		500					**500**
561 – Heavy Use Area Protection (acres)		0.1					**0.1**
595 – Integrated Pest Management		500		792			**1292**
612 - Tree / Shrub Establishment (acres)		1395	10000	10000	2500	530	**24425**
614 – Watering Facility (number)		20					**20**
642 – Water Well (number)		10					**10**
643 - Restoration & Management of Rare & Declining Habitats (acres)	8835						**8835**
645 - Upland Wildlife Habitat Management (acres)	49755	4000	34600		5000	796	**94151**
647 - Early Successional Habitat Development & Management (acres)			200		1000		**1200**

	AL	FL	GA	LA	MS	SC	Totals
WHEG?		Y	N	N	N	Y	
Anticipated Avg. Contract Period	**3 yrs**	**5 yrs**	**4 yrs**	**5 yrs**	**2 yrs**	**5 yrs**	
Conservation Practice Standards	**Amounts by State**						
655 - Forest Trails and Landings (acres)			200		250		**450**
666 - Forest Stand Improvement (acres)		2835	8000		8000		**18835**

Use of Best Science to Support Creating Desired Habitat Conditions

To support effective application of each of the conservation practices, NRCS and the Service worked collaboratively to a develop WHEG for the Gopher Tortoise (GOTO). The WHEGs are tools that are developed at the NRCS state level, and used by field personnel, to assess existing habitat conditions and identify limiting habitat factors in the planning area. The WHEGs are named in a manner that may use terminology such as "evaluation", "appraisal", "assessment", or "habitat suitability model". They usually take a form similar to Habitat Suitability Index Models (See the Service's Ecological Services Manual, Habitat as a Basis for Environmental Assessment, 1980) and often include variables that are relatively easy for non-biologist staff to collect while in the field.

To evaluate the habitat for the Gopher Tortoise, the NRCS worked with the Service and other partners to develop a range-wide WHEG that will be used by all states to evaluate Gopher Tortoise habitat (see Appendix II). The WHEG evaluates existing (benchmark) habitat conditions based on multiple elements such as soils, pine basal area (BA), shrub cover (percentage), herbaceous ground cover (percentage), average shrub height (inches), herbaceous species richness (grasses, forbs, and legumes), forest management or harvest activities, grazing management, noxious and or invasive plant species, and habitat size. The score for each element ranges from 0 to 1.0, with 0.5 meeting the bare minimum quality criteria for Gopher Tortoise habitat. Elements scoring below 0.5 do not meet Gopher Tortoise habitat criteria indicating a lack of viable habitat and likely the species is not present (i.e. a baseline of zero). The WHEG can also be used to cast a future score for the expected condition of habitat after the implemented conservation practices have reached maturity.

After completing the Gopher Tortoise WHEG, the planner will then work with the client to develop and evaluate alternatives to address the resource concerns that do not meet quality criteria for GOTO habitat. A conservation practice may be a structural or vegetative measure, or a management activity used to restore, enhance or protect Gopher Tortoise habitat. The suite of practices chosen from Table 2 becomes the Conservation Plan, a record of the client's decisions for the treatment of resource problems.

Incorporation of Jointly Developed Conservation Measures

Inherent to the NRCS conservation planning process is the minimization of potentially negative impacts that may occur during the implementation of any conservation practice on the planning unit. As a component of the WLFW-GT Program, we developed Conservation Measures for each of the resource

effects that are incorporated into the covered conservation practices. Conservation Measures consist of additional criteria in the conservation practice standard that avoid or minimize the amount or magnitude of adverse effects on species as a result of practice implementation. In most cases these measures ensure that implementation is not likely to adversely affect any federally listed species or critical habitat.

Monitoring

Monitoring and tracking will occur through the efforts of State and Federal wildlife agencies. The Service and NRCS will also conduct assessments to measure the biological response of gopher tortoise populations to conservation practices and adaptively improve program implementation each year. Sampling techniques will be adaptive and use standardized techniques.

Outcomes Expected

The overall goal of the WLFW- GT Program is to increase gopher tortoise abundance and distribution through habitat improvements and by addressing local and landscape threats. At least one of the identified core management practices will take place on all acres contracted through the WLFW – GT Program. The long-term implementation of these core practices is essential to the success of the WLFW – GT Program. In addition, supporting practices such as brush control, forest management, prescribed fire, and associated practices will provide the tools private landowners need to properly implement conservation, enhancement, and/or restoration actions for the gopher tortoise and its associated species.

In the short-term, the desired outcome is additional management and enhancement of gopher tortoise habitat on private lands within the Action Area. Over the long-term it is anticipated that the WLFW – Gopher Tortoise Program will facilitate the stabilization of existing populations, creation of new habitat, reduction of fragmentation of suitable habitat and reduction or elimination of threats and challenges to recovery and conservation of not only the gopher tortoise but other covered species as well. Many other federally and non-federally protected species are expected to benefit from the WLFW – GT Program.

The NRCS is neither a regulatory nor a land management agency, and its role in farm and range management issues is largely advisory at the invitation of individual clients. Technical advice and planning alone do not constitute a federal nexus, as the NRCS has no control over the conservation plan and the client is the decision maker for the conservation plan. However, beginning with the 2002 Farm Bill and continuing with the programs of the 2008 Farm Bill, clients can now obtain financial assistance directly from NRCS to implement their conservation plan, establishing a federal nexus for the agency. Some financial programs provide rental payments for placing eligible lands into conservation easements and are not covered by this Opinion. Most financial assistance programs consist of a term contract between a client and the NRCS where the client agrees to install and maintain a suite of conservation practices to improve natural resource management, and receive a reimbursement of a portion of the cost as an incentive for completing each practice to NRCS standards and specifications.

NRCS and partners will conduct assessments to measure the biological response of gopher tortoise populations to conservation practices, assess the effectiveness of implementing conservation practices and measures, and adaptively improve program implementation each year.

STATUS OF THE SPECIES/CRITICAL HABITAT

Gopher Tortoise

Species/critical habitat description

The gopher tortoise is the only tortoise (family Testudinidae) east of the Mississippi River. It is larger than any of the other terrestrial turtles in this region, with a domed, dark-brown to grayish-black shell (carapace) up to 14.6 inches long, weighing up to 13 lbs (6 kg). The lower shell (plastron) is yellowish and hingeless. Tortoises cannot completely withdraw their limbs, which remain visible when folded and retracted. The hind feet are elephantine or stumpy, and the forelimbs are shovel-like, with claws used for digging. In comparison to females, males are smaller; usually have a larger gland under the chin, a longer gular projection, and more concave plastron. Hatchlings are up to 2 inches in length, with a somewhat soft, yellow-orange shell. As with other chelonians, gopher tortoises possess a keratinized beak, and lack teeth. Critical habitat has not been designated.

Life history

The gopher tortoise is a long-lived, native burrowing species of the open, fire-maintained longleaf pine ecosystem. Historically, typical gopher tortoise habitat consisted of open, frequently burned longleaf pine or longleaf pine/scrub oak uplands and flatwoods on moderately well drained to xeric soils. Such habitat provided adequate sunlight reaching the forest floor to stimulate the growth and development of the herbaceous plant stratum for forage, with sufficient warmth for basking and the incubation of eggs.

The burrows of a gopher tortoise are the habitat and center of normal feeding, breeding, and sheltering activity. Gopher tortoises excavate and use more than one burrow for shelter beneath the ground surface. Burrows, which may extend for more than 30 feet, provide shelter from canid predators, fire, winter cold, and summer heat. Dogs and large canids are the most common predator of adult tortoises (Causey and Cude 1978).

In stable populations with fire-maintained, open longleaf pine habitat, females may use an average of five burrows each while males occupy an average of 10 burrows (Eubanks et al. 2003). In poor habitat due to encroaching, fire intolerant shrubs and hardwoods, gopher tortoises tend to excavate and use fewer burrows, probably because of limited sites that are sufficiently open. Males tend to use more burrows and move more frequently among their different burrows than females as they seek breeding opportunities with females (McRae et al. 1981; Diemer 1992a, 1992b; Smith 1995; Tuma 1996; Boglioli et al. 2000; Eubanks et al. 2003). The term "active burrow" is applied to burrows exhibiting indications it is likely inhabited by a gopher tortoise. Characteristics of active burrows include fresh soil excavated from the interior of the burrow, deposited on the apron at the burrow entrance; tortoise feces on the apron or near the burrow entrance; and eggshells and tracks. Inactive burrows, which display conditions of recent use and occupancy by a tortoise, are considered to be used as part of the annual home range of one or more tortoises, but are not currently occupied by a tortoise. Indicators of inactive burrows include suitable size and shape of the burrow entrance; a recognizable apron of bare soil without encroachment of grasses or shrubs; and small amounts of leaf litter in the entrance that have not been

moved by a tortoise. Abandoned burrows are unlikely to be used by a tortoise and, normally exhibit indications of erosion, a loss of shape and structure, vegetative overgrowth, and no apron.

Tortoises spend most of their time within burrows and emerge during the day to bask in sunlight, to feed, and reproduce. Tortoises are active above ground during the growing season when daytime temperatures range from 75 - 87 °F (McRae et al. 1981; Butler et al. 1995). Daily active periods usually are unimodal in spring, followed by bimodal periods (early to mid-morning, middle to late afternoon) during the hotter temperatures of summer (McRae et al. 1981). Daily activity above ground becomes significantly reduced by the end of the growing season during October with cooler temperatures. Tortoises take shelter within their burrows during the dormant season, become torpid, do not eat, and rarely emerge except during periods of warm days to bask in sunlight at the burrow entrance. Except for those tortoises in southern peninsular Florida that do not have an overwintering period, most tortoises become active again during early spring.

Tortoises mostly forage on foliage, seeds, and fruits of grasses and forbs, generally in an area of about 150 feet surrounding each burrow (McRae et al. 1981; Diemer 1992b). The diet of adults resembles that of a generalist herbivore, with at least some preference for some plants over others, and may also include insects and carrion (MacDonald and Mushinsky 1988; Birkhead 2001). Juvenile tortoises tend to forage on fewer plant species, eat fewer grasses, and select more forbs, including legumes, than adults (Mushinsky et al. 2003).

Burrows are not randomly located in the environment. Tortoises select and prefer burrow sites in open sunny areas (Boglioli et al. 2000; Rostal and Jones 2002). Such sites reflect areas where herbaceous plants for food are more abundant on the forest floor and, for females, sunlight and soil temperatures for egg incubation are more suitable. Also, males select sites and burrows that increase their proximity to females and breeding opportunities (Boglioli et al. 2000; Eubanks et al. 2003). The repeated use and travel to the same burrows by individual tortoises in stable habitat reveal that tortoises know the geography of their home range, burrows, and the location of neighboring tortoises (Eubanks et al. 2003).

Reproduction

Tortoises breed from May through October (e.g. Landers et al. 1980; McRae et al. 1981; Taylor 1982; Wright 1982; U.S. Fish and Wildlife Service 1987; Diemer 1992a; Eubanks et al. 2003). Females ovulate during spring, but likely store sperm so that active breeding during ovulation may not be always be required for fertilization. Males travel to female burrows and copulation occurs above ground at the burrow entrance, more frequently during July to September, a period of peak sex and adrenal steroid hormones (Ott et al. 2000; Eubanks et al. 2003). In earlier work by Douglass (1986), he described gopher tortoise "colonial" tendencies with aggregations of burrows in which dominant males competitively and behaviorally exclude other males at female burrows to maintain a loose female harem as a mating system. These more recent studies do not indicate the clear existence of an exclusive dominance hierarchy. Also, aggregations of burrows in some habitat and study sites probably is an artifact of fragmentation and the concentration of burrows in the available remaining suitable habitat (Mushinsky and McCoy 1994; Boglioli et al. 2003).

Females do not reproduce every year. In the listed range, about 80 percent of the females at Marion County Wildlife Management Area (WMA) in Mississippi and 85 percent of the females at Ben's Creek

WMA in Louisiana were gravid each year (Smith et al. 1997). Females excavate a shallow nest to lay and bury eggs, usually in the apron of soil at the mouth of the burrow, but they may lay elsewhere if the apron is excessively shaded (Landers and Buckner 1981). Range-wide, average clutch size varies from about four to 12 eggs/clutch. Average clutch size in the listed range, from 4.8 - 5.6 eggs/clutch, is comparably low (Seigel and Hurley 1993; Seigel and Smith 1995; Tuma 1996; Epperson 2003). Clutch size generally is positively correlated with adult female size (Diemer and Moore 1994; Smith 1995; Rostal and Jones 2002).

Females usually lay about five to seven eggs from mid-May through mid-July in the soil of the apron at the burrow entrance (Butler and Hull 1996; Smith et al. 1997) and egg incubation lasts 80 - 110 days (Diemer 1986; Smith et al. 1997). Incubation at temperatures from 27°C to 32°C is required for successful development and hatching (e.g. Spotila et al. 1994; Burke et al. 1996; DeMuth 2001; Rostal and Jones 2002; Noel and Qualls 2004). As in other species, sex determination is temperature dependent (Burke et al. 1996; DeMuth 2001).

Nest depredation by vertebrates typically has been considered substantial, although little quantitative data is available. From studies in southern Georgia, Landers et al. (1980) estimated about 90 percent of nests were destroyed by predators. In a much smaller study from southern Alabama, about 46 percent of nests (n = 11) were destroyed by raccoons, opossums, and armadillos (Marshall 1986). Egg hatching success at experimentally protected nests has ranged from 28 - 97 percent in Florida and Georgia (92 percent, Arata 1958; 86 percent, Landers et al. 1980; 28 percent, Linely 1986; 67 to 97 percent, Smith 1995; 80.6 percent, Butler and Hull 1996). In the listed range in Mississippi, mean hatching success from protected nests in the field has ranged from 28.8 - 56 percent (Epperson and Heise 2003; Noel and Qualls 2004).

Hatchlings excavate themselves from the nest and emerge from the middle of August through October (Ashton and Ashton 2008). Hatchlings and yearlings (zero to one year old) may temporarily use the adult burrow, bury under sand or leaf litter, or excavate a small burrow nearby (Douglass 1978; Wilson et al. 1994; Butler et al. 1995; Pike 2006). Growth is most rapid during the juvenile stage, becoming slower at the onset of adulthood and reproductive maturity, followed by little or no adult growth (Mushinsky et al. 1994; Aresco and Guyer 1998, 1999). Generally, tortoises become adults at about 20 years of age, although the minimal stage to reach reproductive maturity is determined by size rather than age. Growth rates and sizes at sexual maturity can vary among populations and habitat types (Landers et al. 1982; Mushinsky et al. 1994; Aresco and Guyer 1998, 1999).

Hatchlings/yearlings initially move up to about 50 feet (15 m) from their nest to establish their first burrow, from which they will subsequently excavate and use about five burrows in a home range as small as about 0.5 acres (0.2 ha), to as large as 11.8 acres (4.8 ha) (Mushinsky et al. 1994; Butler et al. 1995; Epperson and Heise 2003; Pike 2006). Yearlings move, on average, relatively short distances to establish new burrows, although they are known to have traveled up to 1,485 feet (450 m) to new burrows (Butler et al. 1995; Epperson and Heise 2003). Hatchlings and yearlings may take shelter beneath litter and woody debris during longer distances or times encountered to move to a new burrow (Diemer 1992b; Butler et al. 1995). Yearlings and juveniles usually forage within about 23 feet (7 m) from their burrow (McRae et al. 1981; Wilson et al. 1994; Butler et al. 1995; Epperson and Heise 2003).

Home range

Home range size and movements increase with age and body size. The burrows of a gopher tortoise represent the general boundaries of a home range, which is the area used for feeding, breeding, and sheltering. Home range area tends to vary with habitat quality, becoming larger in areas of poor habitat (Auffenberg and Iverson 1979). Males typically have larger home ranges than females. Mean home ranges of individual tortoises in Alabama, Florida, and Georgia outside the federally listed area have varied from 1.3 - 5.2 acres (3.2 - 2.2 ha) for males and 0.2 - 2.5 acres (0.09 - 1.0 ha) for females (McRae et al. 1981; Auffenberg and Franz 1982; Diemer 1992b; Tuma 1996; Ott 1999; Eubanks et al. 2003; Guyer 2003). In comparison to females, male tortoises use more burrows, and during breeding season, move among burrows more frequently over longer distances (McRae et al. 1981; Auffenberg and Franz 1982; Diemer 1992b; Smith 1995; Tuma 1996; Ott 1999; Eubanks et al. 2003; Guyer 2003).

A burrow may or may not be exclusively used by just one gopher tortoise. Two or more tortoises may share the same burrow, although the burrow is used at different times of the year by different individuals. Home ranges overlap when a burrow is used by more than one tortoise. About 50 percent of the area occupied by 123 tortoises was shared by two or more tortoises in relatively pristine, stable habitat in southwestern Georgia (Eubanks et al. 2002). At Camp Shelby, Mississippi, average home range varied from 7.3 - 10.4 acres for males and 12.1 - 32.9 acres for females (Tuma 1996; Guyer 2003). At another population on timber industry land in Alabama, average home range was 10.4 acres (4.2 ha) for males and 32.9 acres (13.3 ha) for females. These home ranges are larger than those typically determined for tortoises at populations in Alabama, Georgia, and Florida outside the listed range. Since gopher tortoise movements and distance increase as herbaceous biomass and habitat quality decrease (Auffenberg and Iverson 1979; Auffenberg and Franz 1982), larger home ranges at these two study sites in the listed range probably reflect differences in habitat quality. Habitat conditions on the timber industry study site were highly heterogeneous, with patches and stands of suitable habitat mixed among patches of unsuitable habitat. These tortoises moved among relatively long distances to different burrows located in suitable habitat patches within a matrix of poor and unsuitable habitat.

As distances increase between gopher tortoise burrows, isolation among tortoises also increases due to the decreasing rate of visitation and breeding (Boglioli et al. 2003; Guyer 2003). Using extensive data from individual tortoise interburrow movements and home range size, Eubanks et al. (2003) found that most colonies or breeding population segments would consist of burrows no greater than about 558 feet (170 meters) apart. Guyer (2003) found that males only rarely will move from their burrows up to 1,640 feet (500 meters) to a female burrow for mating opportunities, and females typically experience a visitation rate of near zero when their burrows are 460 - 623 feet (140 - 190 meters) from nearest neighbors. Demographically, tortoises located at distances of about 600 feet (200 meters) from other tortoises are functionally isolated and subdivided as separate breeding populations. Thus, breeding populations or colonies likely consist of tortoises and burrows in suitable, unfragmented habitat within 600 feet or less from each other.

Habitat

Gopher tortoises require well-drained, sandy soils for burrowing and nest construction, an abundance of herbaceous ground cover for food, and a generally open canopy that allows sunlight to reach the forest floor (Landers 1980; Auffenberg and Franz 1982). Longleaf pine and oak uplands, xeric hammock, sand pine and oak ridges (beach scrub), and ruderal (disturbed) habitat most often provide the conditions

necessary to support gopher tortoises (Auffenberg and Franz 1982). Ruderal (i.e., disturbed or atypical) habitats include roadsides and utility rights-of-way, grove/forest edges, fencerows, and clearing edges. In the western range, soils contain more silt, and xeric (dry) conditions are less common west of the Florida panhandle (Craul et al. 2005). Ground cover in this Coastal Plains area can be separated into two general regions with the division in the central part of southern Alabama and northwest Florida. To the west, bluestem (*Andropogon* spp.) and panicum (*Panicum* spp.) grasses predominate; to the east, wiregrass (*Aristida stricta*) is most common (Boyer 1990). However, gopher tortoises do not necessarily respond to specific plants but rather the physical characteristics of habitat (Diemer 1986). Historic gopher tortoise habitats were open pine forests, savannahs, and xeric grasslands that covered the coastal plain from Mexico and Texas to Florida. Historic habitats might have had wetter soils at times and been somewhat cooler but were generally xeric, open, and diverse (Ashton and Ashton 2008).

Gopher tortoises have a well-defined activity range where all feeding and reproduction take place and that is limited by the amount of herbaceous ground cover (Auffenberg and Iverson 1979). Tortoises are obligate herbivores eating mainly grasses, plants, fallen flowers, fruits, and leaves. Gopher tortoises prefer grassy, open-canopy microhabitats (Boglioli et al. 2000), and their population density directly relates to the density of herbaceous biomass (Auffenberg and Iverson 1979; Landers and Speake 1980; Wright 1982; Stewart et al. 1993) and a lack of canopy (Breininger et al. 1994; Boglioli et al. 2000). Grasses and grass-like plants are important in gopher tortoise diets (Auffenberg and Iverson 1979; Landers 1980; Wright 1982; Macdonald and Mushinsky 1988; Mushinsky et al. 2006). A lack of vegetative diversity may negatively impact the long-term sustainability of gopher tortoise populations (Ashton and Ashton 2008).

Gopher tortoises require a sparse canopy and litter-free ground not only for feeding, but also for nesting (Landers and Speake 1980). In Florida, McCoy and Mushinsky (1995) found that the number of active burrows per tortoise was lower where canopy cover was high. Females require almost full sunlight for nesting (Landers and Buckner 1981) because eggs are often laid in the burrow apron or other sunny spot and require the warmth of the sun for appropriate incubation (Landers and Speake 1980). At one site in southwest Georgia, Boglioli (et al. 2000) found most tortoises in areas with 30 percent or less canopy cover. Diemer (1992a) found that ecotones created by clearing were also favored by tortoises in north Florida. When canopies become too dense, usually due to fire suppression, tortoises tend to move into ruderal habitats such as roadsides with more herbaceous ground cover, lower tree cover, and significant sun exposure (Garner and Landers 1981; McCoy et al. 1993; Baskaran et al. 2006). In Georgia, Hermann et al. (2002) found that open pine areas (e.g., pine forests with canopies that allow light to penetrate to the forest floor) were more likely to have burrows, support higher burrow densities, and have more burrows used by large, adult tortoises than closed-canopy forests. Historically, open-canopied pine forests were maintained by frequent, lightning-generated fires.

Population dynamics

As long-lived animals, gopher tortoises naturally experience delayed sexual maturity, low reproductive rates, high mortality at young ages and small size-classes, and relatively low adult mortality. The growth and dynamics of populations are stochastically affected by natural variation due to demographic rates, the environment, catastrophes, and genetic drift (Shaffer 1981). Factors affecting population growth, decline, and dynamics include the number or proportion of annually breeding and egg-laying females (breeding population size), clutch size, nest depredation rates, egg hatching success, mortality

(hatchling/yearling, juvenile-subadult, adult), the age or size at first reproduction, age- or stage-class population structure, maximum age of reproduction, and immigration/emigration rates.

These factors and data have been evaluated in several investigations of population viability to estimate the probabilities of gopher tortoise population extinction over time and the important factors affecting persistence. In the absence of field surveys and long-term monitoring, models may be used to project the status of populations in the future based on a specific set of assumptions and assignment of demographic parameters. There have been four substantive modeling efforts evaluating the long-term persistence of gopher tortoises (Tuberville *et al.* 2009). Two early modeling efforts focused on estimating the minimum number of tortoises needed for a population to persist for 200 years (Cox *et al.* 1987). Although relatively small population sizes (40–50 adults) were modeled to persist over the model duration, all populations declined and were projected to go extinct at some point in the future depending on model parameters.

Miller (2001) assessed the likelihood of tortoises being extirpated from Florida over a 100-year period when evaluating all known tortoise populations or only those on public lands considering a variety of assumptions regarding survivorship, carrying capacity constraints, disease, etc. (Miller 2001). The model results suggest that gopher tortoises have greater than 80 percent chance of persisting in Florida over the next 100 years whether looking at all known populations or only those on public lands (Miller 2001). Furthermore, they concluded that populations as small as 50 individuals can have conservation value under favorable conditions, but under less favorable habitat conditions populations larger than 250 individuals would be necessary to protect against extinction due to stochastic factors that increase hatchling and adult mortality (Miller 2001).

The most recent modeling effort recognized the need to evaluate the viability of individual populations, rank populations most appropriate for in-situ protection, and determine if nonviable populations are more likely to contribute to conservation through augmentation or translocation (Tuberville *et al.* 2009). All model scenarios resulted in a population decline of one to three percent per year, which varied as a function of habitat quality and location within the range (Tuberville *et al.* 2009). Only modeled populations with at least 250 tortoises were able to persist for 200 years, which is substantially different than earlier model results. Population dynamics of turtles, as long lived animals, have commonly been considered sensitive to demographic changes in adult survival and, in some cases, juvenile survival (Gibbons 1987; Congdon et al. 1993; Heppell and Crowder 1996). Likewise, models and simulations of gopher tortoise populations are most sensitive to adult, hatchling, and juvenile survival rates (Miller 2001; Epperson 2003; Wester 2004). For example, the small but positive population growth rates modeled for a stable base population became negative when mortality of the 3 - 4+ year age class increased from 3.0 to 5.0 percent, or the yearling (0 - 1 year age class) mortality increased from 95 to 97 percent (Miller 2001; McDearman 2006).

Recently, segmented regression models were developed to evaluate the relationship between area of habitat occupied by gopher tortoises and abundance of gopher tortoises to define how many individuals constitute a population and how much area is required for such a population. Data synthesized from 21 study sites in Alabama, Georgia, and Mississippi with varying tortoise population numbers indicated that an average gopher tortoise population consists of 444 burrows, covers 755 ha (1,865 ac), and contains 240 tortoises (Styrsky *et al.* 2010). This average population contained a density of 0.3 tortoises per ha (0.1 per ac), which is below the threshold identified by Guyer (pers. comm.) for maintaining a

persistent population. The authors noted that this average tortoise population was calculated based on a variety of existing landscapes that differed in their current management and past land use history and, therefore, did not represent what a population of tortoises might be in areas that were all managed with frequent fire and contained the uneven-aged trees of old-growth longleaf pine forests. Thus, it is likely that tortoises could persist on smaller parcels, but only if habitat were aggressively managed (Styrsky *et al.* 2010). Lack of prescribed fire or ineffective use of prescribed fire is known to be a substantial impediment to the restoration and maintenance of gopher tortoise habitat throughout much of its range. The model results depict a typical tortoise population as one occupying a large area. This seems congruent with existing habitat conditions that are reported throughout much of the tortoise's range. Therefore, the model results show that most existing conservation lands contain too few tortoises and too little suitable habitat to support persistent tortoise populations.

Population status and trends

Effectively assessing the status (i.e., whether it is increasing, decreasing, or stable) of the gopher tortoise throughout its range requires evaluation of the distribution of tortoises, number of tortoises and populations, number of individuals in populations, and trends in population growth. As we indicated above, we do not have specific distribution data for most of the tortoise's range, but we estimated where potential habitat existed and where tortoises may still be present. Below, we provide summaries of survey data about the sizes and, in some cases, trends of gopher tortoise populations. There is a noticeable disparity between the apparently large area (expressed in hectares or acres, or ha/ac) of potential gopher tortoise habitat reported above and actual numbers of individual tortoises known from populations that have been surveyed, as summarized below. Upon cursory examination, there seem to be few tortoises where there are millions of hectares of potential habitat. Many State and federal agencies, non-governmental organizations (NGO), and timber owners have only recently begun to assess where and how many gopher tortoises are present on lands they own or manage.

Our review of the literature indicates that the status of an individual gopher tortoise population is dependent on the size of the population and its demographic performance. For comparative purposes, and as described in greater detail below, we considered tortoise populations to be large enough to persist in the future (i.e., viable) if they contained 250 or more reproductively active individuals. Ideally, recruitment should exceed mortality, but few long-term studies provide this demographic information. In the absence of these data, burrow surveys that report hatchling- and juvenile-sized burrows indicate that recent recruitment occurred, but we still often lack information about whether the observed level of recruitment is sufficient to offset mortality. The amount of habitat necessary to support a population of at least 250 breeding individuals likely varies depending on habitat quality. Populations in poor-quality habitat, such as those in atypical vegetative communities and in areas not aggressively managed, will likely require more area than populations in high-quality soils where there would be sparse canopy cover, multi-aged pine forests with abundant ground cover, and where prescribed fire is used periodically to maintain habitat conditions. Because of these variations, the density of gopher tortoises in a population that is large and demographically viable will vary.

A wide variety of information is available on the number and density of gopher tortoises and their burrows from many areas throughout their range. These data resulted from numerous surveys/censuses using a variety of methodologies ranging from one-time censuses to repeated surveys over several decades. The diversity of data poses a challenge when trying to evaluate the status of a species from a

landscape perspective. For example, in some areas we have more data (e.g., Florida and in portions of the listed range), and we have higher confidence in drawing conclusions about status of tortoises in these areas. In other areas, where there is little or no data, our confidence in assessing the status of tortoises is lower. Because of disparities in the type of data collected, methodologies in collecting data, and differences in the scope of studies, it is not possible to simply combine datasets to evaluate the status of the gopher tortoise throughout its range. Instead, we considered each individual dataset in the context of all other best available science to form general conclusions about the status of the gopher tortoise.

In the western portion of their range, gopher tortoise populations are small and occur in fragmented habitat. The largest and most substantial gopher tortoise populations in the western portion of its range occur on the De Soto National Forest in southern Mississippi. Long-term monitoring here indicates a decline in population sizes, a tendency towards adult-dominated populations, and a lack of, or very low, recruitment. Results of smaller-scale surveys of forest lands in Mississippi and public and private lands in Louisiana are largely consistent with findings on the De Soto National Forest. There are no known populations large enough (e.g., > 250 individuals) to persist long-term based on projections resulting from recent modeling efforts.

The gopher tortoise is more widespread and abundant in parts of the eastern portion of its range, particularly southern Georgia and central and northern Florida. Long-term monitoring data indicate that many populations have declined and most are relatively small and fragmented. Smaller-scale, short-term or one-time surveys throughout the unlisted portion of the range indicate that tortoise populations typically occur in fragmented and degraded habitat, are small, and densities of individuals are low within populations. Unlike the western portion of the range, there are several known populations of tortoises in the eastern portion of the range that appear to be sufficiently large to persist long-term (e.g., Camp Blanding Joint Training Center, Florida; Chassahowitzka Wildlife Management Area, Florida; Fort White Wildlife and Environmental Area, Florida; Jennings Forest Wildlife Management Area, Florida; Three Lakes Wildlife Management Area, Florida; Fort Benning, Georgia; Fort Stewart, Georgia; River Creek Wildlife Management Area, Georgia; Townsend Wildlife Management Area, Georgia). There are about 80 other public parcels in Florida that contain a substantial amount of potential gopher tortoise habitat but surveys or censuses of these areas have not been conducted to estimate the number of tortoises present (FWC 2011b).

The decline of the gopher tortoise has been linked to the decline of the open, fire maintained longleaf pine forest and ecosystem (Service 1990). About 80 percent of the original habitat for the gopher tortoise within its listed range has been lost due to urbanization and agriculture (McDearman 2005). In remaining forests, management practices involving dense pine stands for pulpwood production, the silvicultural conversion from longleaf to other pines, and fire exclusion or infrequently prescribed fire have further reduced habitat for the species. These practices eliminate the open, sunny forest with a well developed groundcover of grasses and forbs needed by tortoises for burrowing, nesting, and feeding (Landers and Buckner 1981; Auffenberg and Franz 1982). Other threats and causes for decline include habitat fragmentation, fire ants, predation, and human-caused mortality as a result of roads and heavy equipment operations during forest site preparation and timber harvest (Service 1990).

Recovery criteria

The gopher tortoise is federally listed as a threatened species in the western part of its range, from the Tombigbee and Mobile Rivers in Alabama west to southeastern Louisiana on the lower Gulf Coastal

Plain (Service 1987). The listed range of the gopher tortoise includes three counties in southeastern Alabama, 14 counties in southern Mississippi, and three parishes in Louisiana. Most gopher tortoise habitat is privately owned (70 percent), while about 20 percent is owned by the U.S. Forest Service (USFS), and 10 percent by other public agencies (Noss 1988). No critical habitat has been designated for this species.

The Service's recovery plan (Service 1990) for the gopher tortoise establishes short-term and long-term criteria involving public and private lands to delist the species (USFS 1990). The DeSoto National Forest represents a core area where management actions are required to prevent this threatened species from becoming endangered. This is the first and most immediate objective of the recovery plan. The long-term objective, delisting, involves substantial voluntary commitments from private landowners.

The short-term objective is to establish and maintain populations on the DeSoto National Forest, including Camp Shelby, on 18,144 acres (7,343 ha) at densities of 1.2 - 2.8 burrows/acre (3-7 burrows/ha). This is the acreage estimated to consist of deep sandy soils, designated as priority soils, and at burrow densities indicative of large, stable populations on such soils in Florida. By these criteria and using a 0.61 burrow occupancy rate, the Service's recovery plan estimates the total recovery population on DeSoto National Forest would consist of 13,437 - 31,354 tortoises. More recent data on the average percentage of active and inactive burrows inhabited by tortoises in the listed range reveals that the 0.61 burrow conversion factor is too large (e.g. Mann 1995; Wester 1995). Using Mann's (1995) correction factor of 0.414, then 9,120 - 21,280 tortoises would occur on DeSoto National Forest by this acreage with burrow density criteria at 0.5 - 12 tortoises/acre. For a minimally viable population of at least 75 tortoises, the lower range of the recovery criterion of about 9,120 tortoises would represent up to 122 viable populations, or less with larger individual populations.

On July 26, 1990, the USFS and Service completed formal section 7 consultation on the effect of a proposed management plan for the gopher tortoise on DeSoto National Forest. The objective of the USFS' plan is to promote recovery by maintaining and improving gopher tortoise habitat. Management measures to attain these objectives included prescribed fire, timber thinning, and regeneration to longleaf pine. Because of recent surveys documenting a declining gopher tortoise population, primarily due to poor habitat associated with encroaching shrubs and hardwoods in response to infrequent fire, the Service and USFS have reinitiated an informal section 7 consultation phase to remedy management problems that have impaired successful habitat restoration and maintenance. The successful implementation of a modified gopher tortoise habitat management plan is crucial to stabilize declining populations and to prevent the species from becoming endangered. This will require an increase in the frequency of growing season prescribed fire, with thinning and selective herbicide treatment in some areas with inadequate ground fuels to restore and maintain habitat. Also, management needs to be prioritized and designated on core patches of priority soils as well as adjoining areas of suitable soils to establish and maintain habitat areas of sufficient size for future viable populations. Depending on burrow density and home range overlap, the minimal reserve size for a single minimally viable population may range from 50 – 200 acres (19 – 81 ha) (Eubanks et al. 2002).

On private lands, the long-term objective for recovery is the establishment of 1.2 gopher tortoise burrows per acre (3 burrows/ha) on 45,945 acres (18,594 ha) of sandhill communities, where such burrow densities are most likely (USFS 1990). This acreage represents the area of privately-owned upland forests on sandy soils estimated by Lohoefener and Lohmeier (1984) at about the time of listing, although recovery objectives for private lands are not necessarily restricted to priority soil types. Using

the 0.414 burrow conversion factor, recovery on private lands would represent about 23,094 tortoises by these criteria, or about 300 or fewer individual populations, each with 75 or more tortoises with good, long-term habitat management commitments.

Most of the timberland in the listed range of gopher tortoise is privately owned. In south Mississippi, for example, only about 14 percent of upland pine forests are publicly-owned and managed (Kelly and Sims 1987). Recovery for the gopher tortoise on private lands will require substantial voluntary commitments. Private landowners are not required by the Act to implement voluntary management to restore or maintain habitat by preventing or controlling forest succession that leads to habitat degradation in the absence of frequently occurring natural fire. A primary limiting factor for the recovery of the gopher tortoise is the absence of habitat restoration, which includes frequent prescribed fire and other active management measures to control and eliminate encroaching hardwoods and shrubs.

About 400,500 acres of longleaf pine stands remained within the listed range of the gopher tortoise by the 1990's. Gopher tortoises are not restricted to longleaf pine stands, but the best opportunity for recovery on both public and private lands will be in managed longleaf stands. The normal silviculture for the production of longleaf pine timber for poles and sawlogs, with frequent prescribed fire, is highly compatible with gopher tortoise habitat. In the listed range, voluntary landowner programs and technical assistance to private landowners by the Service, state, and private organizations recently have been initiated or are being planned as further incentives to the economic and ecological benefits for longleaf pine habitat restoration. These programs include Partners for Wildlife, Mississippi Partners for Fish and Wildlife, the Healthy Forest Reserve Program, the Emergency Conservation Reserve Program, and the Safe Harbor Program. Currently, about 2,000 acres of longleaf pine and potential gopher tortoise habitat has been treated by some form of habitat restoration management. These and other efforts will have to increase substantially to achieve recovery on private lands.

Recovery for the gopher tortoise on private lands will require substantial voluntary commitments. Private landowners are not required by the Act to implement voluntary management to restore habitat. Likewise, the Act does not require private landowners to implement active management that would prevent the natural processes of forest succession, leading to a further decline of habitat in the absence of a frequently occurring natural fire. A primary limiting factor for the recovery of the gopher tortoise is the absence of habitat restoration, with frequent prescribed fire and other active management measures to control and eliminate encroaching hardwoods and shrubs. The gopher tortoise will not be recovered simply by landowners complying with the prohibitions of section 9 of the Act to avoid incidental take. Active management to restore habitat is required, as well as active fire management to sustain existing suitable habitat.

Eastern Indigo Snake

In addition to the assessment below, a five-year review of the eastern indigo snake was completed in 2008 and provides more detailed information on the status of the species (Service 2008).

Species/critical habitat description

The eastern indigo snake was historically known as the largest North American snake species until recently when an 8.76 foot (267 centimeter (em)) bull snake *(Pituophis catenifer)* was discovered

(Devitt *et al.* 2007). The maximum total length recorded for an eastern indigo individual is 8.6 feet (ft) (262.9 em), while most adult eastern indigo snakes average 5.0 - 7.0 ft (152 - 213 em) (Conant and Collins 1998) in length. This stout-bodied serpent is uniformly iridescent bluish black above and uniformly slate blue below. Throughout much of its geographic distribution, the gular scales on the underside of the head found in the throat region and labial scales bordering the mouth opening are orange to coral-red. However, head and throat coloration can be variable. For example, red coloration may be limited or entirely absent and the center of the throat may be white. The head is generally indistinct from the neck. Scales are smooth and wide, and there are 17 scale rows at mid-body. Adult male eastern indigo snakes have weakly keeled scales on the median 3-5 dorsal scale rows (Conant and Collins 1998). Young eastern indigo snakes are 17-24 inches (43.2 - 61 em) at hatching and resemble the adults in coloration (Conant and Collins 1998). No critical habitat has been designated for the eastern indigo snake.

Life history

In Georgia and north Florida, eastern indigo snakes breed between November and April (Moulis 1976, Speake *et al.* 1987), with females depositing 4 to 12 eggs during Mayor June (Moler 1992). Young hatch in approximately three months. Limited information on the reproductive cycle in south-central Florida suggests the breeding and egg-laying season may be extended. In this region, breeding extends from June to January, egg-laying occurs from April to July, and hatching occurs during mid-summer to early fall (Layne and Steiner 1996). There is no evidence of parental care. Snakes in captivity take three to four years to reach sexual maturity (Speake *et al.* 1987). Maturity in wild snakes has been estimated to be attained at 60 in (150 cm) total length (Speake *et al.* 1987, Layne and Steiner 1996). There is no information on longevity of eastern indigo snakes in the wild; however one captive individual lived 25 years, 11 months (Shaw 1959).

Eastern indigo snakes are active and spend a great deal of time foraging and searching for mates. They are one of the few snake species that are active during the day and rest at night. Eastern indigo snakes are generalized predators. They will eat any vertebrate small enough to be overpowered and swallow their prey alive. Food items include fish, frogs, toads, snakes (venomous, as well as non-venomous), lizards, turtles, turtle eggs, small alligators, birds, and small mammals (Keegan 1944, Babis 1949, Kochman 1978, Steiner *et al.* 1983, and Stevenson *et al.* 2010). Eastern indigo snakes range over large areas and into various habitats throughout the year, with most activity occurring in the summer and fall (Smith 1987, Moler 1985b). Adult indigo snakes have very large activity ranges; most estimates of home ranges vary from several hundred to several thousand acres (ac) (hectares (ha». Below-ground shelters are used year-round by indigo snakes as thermal refugia; where available, gopher tortoise *(Gopherus polyphemus)* burrows are frequently used. In the northern part of the indigo snake's range, gopher tortoise burrows are used to protect against the cold and over-wintering site fidelity at individual gopher tortoise burrows has been documented (Stevenson *et al.* 2003, Hyslop *et al.* 2006). In summer, indigo snakes use burrows as protection from heat and dry conditions since they have been shown to be susceptible to desiccation (Bogert and Cowles 1947). Throughout their range, they also use burrows for foraging, nesting, mating, and shelter prior to shedding (Stevenson *et al.* 2009). They also move seasonally between upland and wetland habitats. Reliance on xeric sandhill habitats throughout the northern portion of the eastern indigo's range in Georgia and northern Florida can be attributed primarily to the availability of gopher tortoise burrows during winter. In wetter habitats or the more southern area of their distribution that lack gopher tortoises, eastern indigo snakes may take shelter in hollowed root

channels, hollow logs, stump holes, or the burrows of rodents, armadillo *(Dasypus novemcinctus),* or land crabs *(Cardisoma guanhumi)* (Lawler 1977, Moler 1985a, Layne and Steiner 1996, Hyslop 2007).

Population dynamics

The eastern indigo snake is very difficult to locate in the field, even in areas where it is known to occur. Thus, it is not amenable to standard population survey and mark/recapture studies. Therefore, population attributes such as sex ratio, age structure, reproductive variables, and mortality in the wild are generally unknown. Several estimates of sex ratios are available from wild populations. Two studies of hatchlings/juveniles (Moulis 1976, Steiner *et al. 1983)* reported sex ratios not differing from one male: one female. However, sex ratios become more male biased in adult snakes (Layne and Steiner 1996, Stevenson *et al.* 2009). Stevenson *et al. (2009)* attributed this bias to lower rates of survival in females, however since males have larger home range sizes and greater daily movement distances than females (Hyslop 2007), males may be more likely to be captured than females. Adult males are significantly longer and heavier than females (Layne and Steiner 1996, Stevenson *et al.* 2009). Although both sexes mature at about the same total length, males continue to grow after sexual maturity, whereas females apparently devote most available energy to vittellogenesis (Service 2008, Stevenson *et al. 2009).*

Due to the difficulties of observing and capturing indigo snakes, even in areas where they are known to occur, the viability of existing populations is unknown. Sites with historical and/or current (post-1999) records for the species are considered to be supporting populations of the eastern indigo snake. The broad distribution and large territory size of the eastern indigo snake complicate evaluation of its population status and trends. Thus, population trend data for the eastern indigo snake are virtually absent. Inferences about abundance, population trends, and the extent of habitat required to support eastern indigo snake populations have been made using data on movements and estimates of home range size (100 percent minimum convex polygons) developed from studies using radio telemetry. In Georgia, average home ranges of 12 ac (4.8 ha) during the winter (December to April), 106 ac (42.9 ha) during late spring/early summer (May to July), and 241 ac (97.4 ha) during late summer and fall (August to November) have been reported (Speake *et al.* 1978). Adult male snakes have larger home ranges than adult females and juveniles. In peninsular Florida, home ranges for females and males range from 4.7 to 371 ac (1.9 to 150 ha) and 3.9 to 807 ac (1.6 to 326.6 ha), respectively (Moler 1985b, Layne and Steiner 1996, Bolt 2006, Dodd and Barichivich 2007). At the Archbold Biological Station, average home range size for female indigos was determined to be 47 ac (19 ha) and overlapping male home ranges to be 185 ac (75 ha) (Layne and Steiner 1996). In a more recent radio telemetry study in Georgia, Hyslop (2007) reported home range sizes of 87.5 to 885 ac (35 to 354 ha) for females and 350 to 3,825 ac (140 to 1,530 ha) for males. Analysis of habitat use suggested an avoidance of paved roads, urban areas, and deciduous forest.

Eastern indigo snakes can move considerable distances in short periods of time. Speake *et al.* (1978) reported that two snakes moved a maximum distance from release points of 2.2 miles (mi) (3.5 kilometers (km» in 42 days and 2.4 mi (3.8 km) in 176 days. Moler (1985b) recorded long distance moves of 0.5 mi (0.8 km) and 1.1 mi (1.7 km) for snakes moving away from their wintering dens in mid to late March. Even longer annual movements may occur. Stevenson *et al.* (2009) recaptured an adult male 14 mi (22 km) from its initial site of capture, two years previous. Indigo snakes exhibit a homing instinct and may return annually to previously used winter dens (Speake *et al.* 1978, Moler 1985b, Speake *et al.* 1987, Stevenson *et al.* 2003, Hyslop 2007). There is some evidence of cannibalism, male

territorial combat (ritualized fighting, often at or near gopher tortoise burrows that contain adult females), and little overlap in the home ranges of same-sex adults in parts of the species range (low population density) (Speake *et al.* 1987, Layne and Steiner 1996, Bolt 2006). These data support the assumption that this large terrestrial species requires a large area to survive. Due to their large home ranges and other behavioral traits, it is estimated that habitat of at least 2,500 ac (1,000 ha) is needed to provide conservation benefits for an eastern indigo snake population (Moler 1992).

Status and distribution

The eastern indigo snake was listed as threatened in 1978 (43 FR 4028) due to population declines caused by habitat loss, over-collecting for the domestic and international pet trade, and mortality caused by rattlesnake collectors who gas gopher tortoise burrows to collect snakes. At the time of listing, the eastern indigo snake was considered a subspecies *(Drymarchon corais couperi).* Currently, the eastern indigo snake is accepted by the scientific community as a separate species *(Drymarchon couperi)* (Crother 2000, Wuster *et al.* 2001*).* At the time of listing, very little was known about the distribution and overall population trend of the eastern indigo snake. Historically, the eastern indigo snake occurred throughout Florida and in the coastal plain of Georgia, Alabama, and Mississippi (Diemer and Speake 1983, Moler 1985a).

The status and distribution of eastern indigo snakes in Georgia was reviewed by Stevenson (2006). He determined that populations of eastern indigo snakes still remain widespread in the lower and middle Coastal Plain of southeastern and south-central Georgia along xeric sand ridges bordering the Altamaha, Canoochee, and Ohoopee rivers, and in Coffee County. Eastern indigo snakes occur on 13 public lands and preserves in Georgia. However, most of these areas are relatively small and some may not support viable indigo snake populations (Stevenson 2006). In the panhandle of Florida (here defined as those areas of Florida to the west of the Suwannee River), eastern indigo snakes persist in low numbers (Enge 2007, Gunzburger and Aresco 2007). Based on museum specimens and field sightings, the eastern indigo snake still occurs throughout peninsular Florida, even though they are not commonly seen (Moler 1985a, Cox and Kautz 2000). In south Florida, the eastern indigo snake is thought to be more widely distributed than in other parts of its range. Given their preference for upland habitats, eastern indigos are not commonly found in great numbers in the wetland complexes of the Everglades region, even though they are found in pinelands, tropical hardwood hammocks, and mangrove forests in extreme south Florida (Duellman and Schwartz 1958, Steiner *et al.* 1983). Eastern indigo snakes are very rare in the Florida Keys, although records exist of the species occurring there as recently as 2009 (Knight pers. comm. 2010). Since 2001, there are eastern indigo snake records from over 80 public lands in Florida (Enge 2007).

The current stronghold for the eastern indigo snake is southeastern Georgia and peninsular Florida. The eastern indigo snake persists in the panhandle of Florida in lower numbers than these two areas. It is functionally extinct in Alabama and Mississippi; however, a project has been initiated in Alabama to establish an eastern indigo snake population on the Conecuh National Forest where longleaf pine restoration work has been successful.

Appropriate management of occupied eastern indigo snake sites continues to be a challenge. Fire suppression, in particular, is affecting many of the remaining natural areas. Implementing long-term management on lands occupied by indigo snakes is necessary if recovery is to be achieved. Public

agencies are attempting to conduct ecosystem management on their lands, but improvements in consistent implementation are needed.

Eastern indigo snakes are tied to the use of gopher tortoise burrows and their longleaf pine habitat in the northern parts of their range (southeastern Georgia and the panhandle of Florida). Due to loss of longleaf pine forests in these areas, and the subsequent decline in gopher tortoises, eastern indigo snakes have also declined.

Since listing, progress has been made in gaining a better understanding of both the quantity and quality of habitat needed for eastern indigo snake populations. Although natural habitats continue to be lost and degraded, and some eastern indigo snake populations have likely declined or been lost, strides have been made in bringing large contiguous blocks of habitat into public ownership. In Georgia, 13 tracts of public land support eastern indigo snake populations. In Florida, over 80 tracts of public land support indigo snakes and 69 of these sites are at least 10,000 ac (4,047 ha) in size.

Analysis of the species/critical habitat likely to be affected

The proposed action has the slight potential to adversely affect individual eastern indigo snake adults and juveniles throughout the range of the species. Overall, the proposed action is expected to be beneficial to the eastern indigo snake by providing essential habitat maintenance and enhancement as well as life history, status, distribution, and habitat information needed for conservation of the species. Critical habitat was not designated for the eastern indigo snake; therefore, the proposed action will not result in the decline or adverse modification of critical habitat.

Black Pine Snake

Species/critical habitat description

Pine snakes (genus *Pituophis*) are large, short-tailed, powerful constricting snakes with keeled scales and disproportionately small heads (Conant and Collins 1991). Their snouts are pointed and they are good burrowers. Black pine snakes are distinguished from other pine snakes by being dark brown to black both on the upper and lower surfaces of their bodies. There is considerable individual variation in adult coloration, however (Vandeventer and Young 1989). Some adults have russet-brown snouts and they may have some white scales on their lips and throat. In addition, there may also be a vague pattern of blotches on the end of the body approaching the tail. Adult black pine snakes range from 48 to 74 inches (122 to 188 centimeters) (Mount 1975; Conant and Collins 1991). Young black pine snakes often have a blotched pattern, typical of other pine snakes, which darkens with age. Black pine snakes are Federal Candidate species and as such are not afforded protection under the Act (U.S. Fish and Wildlife Service 2006).

Life history

Black pine snakes are long-lived reptiles (Snider and Bowler 1992), endemic to the upland longleaf pine forests that once covered the southeastern United States. Habitat for these snakes consists of sandy, well-drained soils with an overstory of longleaf pine, a fire suppressed mid-story, and dense herbaceous ground cover (Duran 1998b). Black pine snakes are diurnal and are often active on hot days, although

they are difficult to observe in the wild even when their locations are known. Duran (1998a) conducted a radio-telemetry study of this species that provided data on habitat use. Snakes in this study were usually located on well-drained, sandy-loam soils on hilltops, ridges, and toward the tops of slopes. They were rarely found in riparian areas, hardwood forests, or closed canopy conditions. More than half of the time, black pine snakes were located underground, usually in the trunks or root channels of rotting pine stumps. Duran (1998a) estimated an average home range of 125 acres (47.5 hectares) for the black pine snake using the results of his study. Males tended to have larger home ranges than females, but the divergence was not statistically different. Pine snakes appeared to remain in established territories, retracing the same paths over time. In addition, there was little overlap in home ranges which may also be an indication of territoriality.

Very few data are available on the breeding or food habits of black pine snakes. Duran (1998a) suggested that reproductive rates of wild black pine snakes may be low. Gravid females have been captured in July and August, however no breeding or nesting behavior has been observed in the wild. In captivity, 7 to 11 large eggs are laid (Vandeventer and Young 1989). The incubation period is approximately 65 days and the young average 18 inches (46 centimeters) at hatching.

The hispid cotton rat (*Sigmodon hispidus*) and the cotton mouse (*Peromyscus gossypinus*) are common within black pine snake home ranges and are most likely important prey for this species (Duran 1998a; Baxley and Qualls 2005). Wright and Wright (1957) reported a black pine snake capture from a rabbit (species not given) nest where it lay atop two young squealing rabbits. Once captured, it was found to have already ingested one young rabbit. Black pine snakes will eat birds in captivity and probably do so opportunistically in the wild. One black pine snake was observed to climb 15 feet (5 meters) into a young oak tree (reported in Mississippi Museum of Natural Science 2001), but it is not known how commonly this species may climb trees.

Population dynamics

The black pine snake is a difficult species to locate even in areas where it is known to occur. As a result, the following estimate of population numbers should probably be considered a minimum. The process used to generate the population estimate was begun by using the results of Duran and Givens (2001) and Baxley and Qualls (2005) to generate data points representing known/assumed black pine snake localities. These points were mapped and buffered with a 2-mile (3.2-kilometer) radius. The buffer radius distance was chosen based on movement and home range data provided by the researchers. Polygons were then drawn around the buffered points. If buffered points overlapped, touched, or were in immediate proximity to each other, they were included in the same polygon. The number of polygons was used as an estimate of the number of black pine snake populations. Following this procedure, it can be estimated that there are 14 extant populations of black pine snakes. Seven of these populations occur in Alabama and seven occur in Mississippi. Three populations occur on state-managed land (21 percent), seven populations occur on private land (50 percent), and four populations occur on federal land (29 percent). The area occupied by two of the seven populations (29 percent) on private land is thought to be small and are unlikely to support viable populations. The four populations on Federal land (all in Mississippi) consist of the majority of the known black pine snake records, are supported by the majority of the acreage of excellent suitable habitat remaining, and have the greatest potential for long-term survival.

Status and distribution

Duran and Givens (2001) reported the results of a habitat assessment of all black pine snake records known at the time of their work. Habitat suitability of the sites was based on how the habitat compared to that selected by black pine snakes in a recently completed telemetry study (Duran 1998b). A probability of occurrence rating was derived for each locality using a combination of the habitat suitability rating and data on how recently and/or frequently black pine snakes had been recorded at the site. Of the 157 known records, it was determined that black pine snakes probably no longer occurred at 53 sites (34 percent of total). Comparing individual records gives equal weight to the many occurrences that have been recently recorded in areas of pine snake abundance, to the sparse records from areas where pine snakes have been extirpated. This greatly underestimates population losses. Removing the more recent records from 1990 to the present eliminates significant bias because during this period a concerted effort was made to locate black pine snakes, especially in areas of quality habitat. Subtracting these records would leave a total of 83 sites, which could be considered "historical" records. Of these, black pine snakes probably no longer occur at 42 (51 percent of historical records). Black pine snake habitat continues to be lost and degraded.

There are historical records for the black pine snake from one parish in Louisiana (Washington Parish), 14 counties in Mississippi (Forrest, George, Greene, Harrison, Jackson, Jones, Lamar, Lauderdale, Marion, Pearl River, Perry, Stone, Walthall, and Wayne counties) and three counties in Alabama west of the Mobile River Delta (Clarke, Mobile, and Washington counties). Duran (1998b) recently completed a status survey for the species. He concluded that black pine snakes have been extirpated from Louisiana and from two counties (Lauderdale and Walthall) in Mississippi. They have not been reported west of the Pearl River in either Mississippi or Louisiana in 24 years (Duran 1998b). There are no recent (post-1979) records for three additional Mississippi counties (Greene, Jackson, and Lamar) where they once occurred. Surveys indicated that black pine snakes remain in three out of three counties in Alabama (Clarke, Mobile, and Washington) and 9 out of 14 counties in Mississippi (Forrest, George, Harrison, Jones, Marion, Pearl River, Perry, Stone, and Wayne). However, the distribution of populations within these counties has become highly restricted due to the fragmentation of the remaining longleaf pine habitat. In seven of the nine occupied Mississippi counties, populations of black pine snakes are concentrated on the DeSoto National Forest (68 percent of all known records). In the remaining occupied Mississippi counties, one population is known from the Marion County Wildlife Management Area, and two occur on private land. Most of the remaining populations in Alabama occupy private, non-industrial timberland where they have an uncertain future. All black pine snake populations outside of the DeSoto National Forest appear to be small and isolated on islands of suitable longleaf pine habitat (Duran 1998b).

Analysis of the species/critical habitat likely to be affected

The proposed action has the slight potential to adversely affect individual black pine snake adults and juveniles throughout the range of the species. Overall, the proposed action is expected to be beneficial to the black pine snake by providing essential habitat maintenance and enhancement as well as life history, status, distribution, and habitat information needed for conservation of the species. The black pine snake is a Federal Candidate species, and therefore, no critical habitat has been designated for the species.

Dusky (=Mississippi) Gopher Frog

Species/critical habitat description

The gopher frog is a mid-sized, stocky, frog in the large cosmopolitan family, Ranidae ("true frogs"). The dusky gopher frog has a stubby appearance due to its short, plump body, comparatively large head, and relatively short legs (Conant and Collins 1991). The coloration of its back is dark and varies in individual frogs. It ranges from an almost uniform black to a pattern of reddish brown or dark brown spots on a ground color of gray or brown (Goin and Netting 1940). Warts densely cover the back. The belly is thickly covered with dark spots and dusky markings from chin to mid-body (Conant and Collins 1991). Males are distinguished from females by their smaller size, enlarged thumbs, and paired vocal sacs on either side of the throat (Godley 1992). Richter (Richter 1998; 1998b) reported mean snout-vent lengths from three years of data. They ranged from 2.5 to 2.8 inches (in) (63.2 to 70.2 millimeters (mm)) for males and 3.1 to 3.3 in (78.0 to 82.7 mm) for females in the extant population. Currently, there is no standardized method to consistently distinguish dusky gopher frog tadpoles from those of leopard frogs and other gopher frogs when in the field (Altig et al. 2001). There are four existing populations of dusky gopher frogs distributed across Harrison and Jackson Counties in Mississippi.

Goin and Netting (1940) originally described gopher frogs from the geographic range of the dusky gopher frog as a distinct species, *Rana sevosa*. However, in subsequent years these frogs were considered part of the subspecies, *Rana capito sevosa* (Conant and Collins 1991). For this reason, the dusky gopher frog was listed as an endangered distinct population segment (December 4, 2001; 66 FR 62993). At listing, the species was identified by the common name Mississippi gopher frog to distinguish it from the wider ranging subspecies. Since listing, the scientific community has recognized the validity of the original description and accepted the species designation, *Rana sevosa*, for gopher frogs occurring in Mississippi (Young and Crother 2001). In the final rule designating critical habitat for the dusky gopher frog (77 FR 35118), the common name and scientific name of the listed entity were changed to be in agreement with the accepted taxonomy of the scientific community.

Critical habitat for the dusky gopher frog was designated on June 12, 2012, and includes 1,544 acres (ac) (625 hectares (ha)) in St. Tammany Parish, Louisiana, and 4,933 ac (1,996 ha) in Forrest, Harrison, Jackson, and Perry Counties, Mississippi (77 FR 35118). The areas (units/subunits) designated include occupied habitat (18 percent of total critical habitat acreage) and unoccupied habitat (82percent of total critical habitat acreage). Critical habitat consists of ephemeral wetland breeding habitat, upland forested nonbreeding habitat surrounding the wetlands where dusky gopher frogs spend most of their lives, and upland connectivity habitat between breeding and nonbreeding habitats.

Life history

Dusky gopher frog habitat, both the upland sandy sites historically forested with longleaf pine and the isolated temporary wetland breeding sites embedded within the forested landscape, are maintained by fires frequent enough to support an open canopy and abundant herbaceous groundcover vegetation. Adult and subadult dusky gopher frogs spend the majority of their lives underground. Gopher frogs use active and abandoned gopher tortoise burrows, abandoned mammal burrows, and holes in and under old stumps as refugia (Allen 1932; LaClaire 1996; Richter et al. 2001). Gopher tortoise burrows probably

represent preferred underground habitats (Godley 1992). The remaining dusky gopher frog populations occur in areas with very few gopher tortoises, most likely as a result of habitat degradation.

Dusky gopher frogs are generally active above ground only in winter when they travel to and from breeding ponds where they mate and deposit eggs, and larvae develop into metamorphic frogs. Gopher frogs can move considerable distances between their breeding and upland sites. A movement of 2.2 miles (3.5 kilometers) between upland habitat and breeding site was recorded in North Carolina (Humphries and Sisson 2011).

Breeding sites are small, relatively shallow, isolated (not connected to any other water body), depressional ponds that dry completely on a cyclic basis. Emergent herbaceous vegetation is important for egg attachment. The dominant source of water to the ponds is rainfall within small, localized watersheds. Substantial winter rains are needed to ensure that ponds fill sufficiently to allow hatching, development, and metamorphosis of larvae. The timing and frequency of rainfall are critical to the successful reproduction and recruitment of dusky gopher frogs. Breeding typically occurs from December to April (Richter et al. 2003), although chorusing and breeding has occurred outside this time frame following tropical storms and hurricanes (Seigel and Kennedy 2000; Sisson 2005).

Female dusky gopher frogs deposit a single clutch of eggs per breeding event that range from 500 to 2,800 eggs (Allen 1932; Richter 1998; Richter and Seigel 1998b, 1998a). Tadpoles metamorphose in 81 to 179 days in the field (Richter et al. 2003), generally in mid-May to late June. Size at metamorphosis can vary widely among years, primarily as a result of hydroperiod length (Richter et al. 2003).

The minimum age at maturity for male dusky gopher frogs is four to six months and age at maturity for females is estimated to be two to three years (Richter and Seigel 2002). No data exist on longevity, however an estimate of maximum longevity of 6 to 10 years was made by Richter et al. (2003). Most adults probably do not survive longer than five years (Richter and Jensen 2005).

Adult dusky gopher frogs are carnivorous, especially insectivorous. Goin and Netting (1940) reported gut contents of carabid (*Pasimachus* sp.) and scarabaeid (general *Canthon* sp. and *Ligryus* sp.) beetles. Dusky gopher frogs probably also eat frogs, toads, other beetles, hemipterans, grasshoppers, spiders, roaches, and earthworms as reported for other species of gopher frogs (summarized in Richter and Jensen 2005).

Population dynamics

Currently, there are only three known naturally occurring breeding sites (populations) of the dusky gopher frog. These populations have been named based on the designation given to their breeding ponds: Glen's Pond, Mike's Pond, and McCoy's Pond. It is estimated that the population at Glen's Pond is composed of less than 100 adult frogs. Data are insufficient to make population estimates for the other two sites. The assumption can be made that the Mike's Pond population is considerably smaller than the Glen's Pond population, based on preliminary genetic work, and the McCoy's Pond population smaller yet since it is based on the record of one calling male frog. The small number of populations of the dusky gopher frog makes it extremely vulnerable to extinction from natural and man-made processes. Major factors affecting population persistence include life span, the number or proportion of annually breeding and egg-laying females, egg hatching success, percent survival of

larvae, and survival rate of metamorphic frogs at the end of their first year. Larval caddisfly predation on eggs and young tadpoles can have important negative effects on recruitment (Richter 2000). Disease in developing tadpoles has been a threat and in one year it caused nearly 100 percent mortality of Glen's Pond tadpoles. The on-going drought has significantly reduced the opportunity for frogs to breed in years when their pond does not fill, and caused breeding sites to frequently dry before a significant number of gopher frogs can metamorphose. Natural metamorphic frogs (not raised in tanks) have been produced at Glen's Pond in only three of the past six years.

Status and distribution

Historically, the dusky gopher frog occurred in at least nine counties or parishes in the States of Alabama, Mississippi, and Louisiana (Service 2001). Today it is known from only four sites (includes one newly translocated population) in two counties in Mississippi. The only breeding site known at the time of listing (Glen's Pond) occurs on the DeSoto National Forest in Harrison County, Mississippi. Subsequent to listing, potential habitat through-out the historic range of the frog (Florida parishes in Louisiana, coastal Mississippi counties, and coastal Alabama west of the Mobile Basin) has been searched extensively for additional breeding populations. In 2004, dusky gopher frogs were found at two other ponds sites, named McCoy's Pond and Mike's Pond, in Jackson County, Mississippi. A single calling male was heard at McCoy's Pond located on 16th section land owned by the state of Mississippi and managed by the Jackson County School board. A small group of tadpoles was collected from the Mike's Pond site located on private land. In 2004, an effort was initiated to translocate tadpoles and metamorphic frogs from the Glen's Pond population to a pond on the Old Fort Bayou Mitigation Bank in Jackson County, Mississippi. As a result of these releases over a period of seven years, two dusky gopher frog egg masses have been observed at the pond and we believe a small breeding population has been established at the site.

Habitat destruction and degradation are considered the primary factors in the decline of the dusky gopher frog. Longleaf pine forested habitat has been reduced to less than five percent of its original distribution (Outcalt and Outcalt 1994). Longleaf pine forests have been converted to pine plantations and developed as residential areas. Ponds appropriate for breeding have been altered by bedding, clearing, damming, and nutrient loading during conversion of the surrounding forested habitat or no longer exist due to land use changes. The frog's remaining habitat continues to be degraded due to fire suppression. In addition, these same factors have resulted in the decline of the gopher tortoise, whose burrows are most likely the preferred habitat for adult gopher frogs. Due to the decline of the gopher tortoise and the historical practice of pushing and hauling away stumps for the naval stores industry, fossorial habitat may be limiting in the frog's upland habitat.

Glen's Pond on the DeSoto National Forest is located in close proximity to an area proposed for a 4,000-acre residential development. Urban and commercial development of this area, including several highway projects, has the potential to further degrade this habitat. Residential development is also occurring in the vicinity of the Mike's Pond site.

In 2003, an undescribed disease was discovered in gopher frog tadpoles at Glen's Pond. Initial work on the disease by researchers at the National Wildlife Health Research Center indicates it is similar to *Perkinsus*, a genus of Mesomycetozoan that occurs in marine invertebrates including oysters. During field work conducted to study the *Perkinsus*-like disease, an additional disease, a chytrid fungus, was

found in two other species of adult amphibians at Glen's Pond. This disease has been implicated in amphibian declines worldwide. The effect of these two diseases on the survival of the dusky gopher frog is unknown.

Glen's Pond has been monitored for the presence of gopher frog egg masses since 1988. In December of 1995, a drift fence was established to completely encircle Glen's Pond. The use of a drift fence allows monitoring of ingress and egress of both adult and metamorphic frogs. Both egg mass surveys and drift fence monitoring are currently being used to assess population status. When egg masses are laid, the eggs are counted and tadpole development at the mass is monitored until the tadpoles become free-swimming. Tadpoles in the pond are surveyed periodically to monitor development rate. Movements of adult and metamorphic gopher frogs are monitored by capturing them as they enter and exit the breeding pond. When breeding occurs, gopher frog eggs are collected, and after hatching, are raised in cattle tanks in the vicinity of Glen's Pond as a hedge against pond drying or other catastrophic events. These tadpoles have also been used in ecological and natural history experiments and translocated to a pond at the Old Fort Bayou Mitigation Bank in Jackson County, Mississippi, in an attempt to start a new population there.

Breeding at the primary breeding site, Glen's Pond, has resulted in a very small number of natural metamorphs since the late 1990's. When breeding occurs, the population there continues to be augmented with a few hundred metamorphs raised in cattle tanks. However, a year with a recruitment class of several thousand metamorphs is needed to protect against the extinction of this species. The likelihood of this event is unknown.

Dusky gopher frogs are held in captivity at zoos across the United States. The decision to move frogs into captivity as a hedge against extinction was made after the discovery of an undescribed disease and the complete loss of reproduction from the 2003/2004 breeding event. The Memphis Zoo, Memphis, Tennessee, has taken the lead in monitoring the captive population and maintaining the studbook. A population analysis and breeding and transfer plan has recently been completed. In the future, translocating tadpoles/frogs from the captive population is planned as a recovery strategy for the dusky gopher frog.

Analysis of the species/critical habitat likely to be affected

The proposed action has the slight potential to adversely affect individual dusky gopher frog adults and juveniles throughout the range of the species. Overall, the proposed action is expected to be beneficial to the species by providing essential habitat maintenance and enhancement as well as life history, status, distribution, and habitat information needed for conservation of the species.

ENVIRONMENTAL BASELINE

The environmental baseline includes the past and present impacts of all State, federal or private actions and other human activities in the action area, the anticipated impacts of all proposed federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process (50 CFR § 402.02).

The action area is the area affected directly and indirectly by the federal action and not merely the immediate area involved in the action (50 CFR§ 402.02).

The action area encompasses the known range of the gopher tortoise, eastern indigo snake, black pine snake and dusky gopher frog in their entirety. Therefore, the status of the species within the action areas and factors affecting the species environment within the action area are identical to those described previously in the "STATUS OF THE SPECIES" section.

EFFECTS OF THE ACTION

The effects of the action are the direct and indirect impacts of the proposed federal action on the species and critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline (50 CFR § 402.02). Besides the gopher tortoise, the covered species evaluated in this section refer to those that may potentially be found in a gopher tortoise burrow (i.e. burrow commensals); and therefore may be affected by those actions that damage the structure of the burrow. Only one of the species identified in Table 1 (the endangered Dusky (=Mississippi) gopher frog – *Rana sevosa*) is a burrow commensal with critical habitat designated; other commensals include the black pinesnake (*Pituophis melanoleucus lodingi* – candidate) and Eastern indigo snake (*Drymarchon corais couperi* – threatened). These four species (gopher tortoise, Dusky (=MS) gopher frog, black pinesnake, and Eastern indigo snake) will hereafter be referred to as the "covered" species.

The Service acknowledges that a net conservation benefit will be accrued to species other than the covered species identified above as a result of WL4W management and restoration activities. However, implementation of these activities has the potential in the short term, to adversely affect individuals of certain non-covered species that may occur on enrolled properties, particularly in Florida.

If federally-listed species other than the covered species potentially exist on an enrolling property, then NRCS and the Service will consult with and assist the landowner in tailoring his/her management actions to avoid take, and minimize any disturbance of those species. In the unlikely event that avoidance and minimization measures cannot be identified and implemented to the extent that incidental take cannot be avoided, then separate reinitiation of section 7 consultation under the Act would occur. The Service will make every effort to expedite such consultations. In Florida, the Service and NRCS are in the process of completing a formal consultation on the NRCS statewide prescribed burning program and associated activities which will address most impacts to non-covered species.

Introduction

The Service has evaluated the identified conservation practice standards in the context of how the individual standards have the potential to produce beneficial and adverse effects to the covered species – at the individual, population, and landscape scales. The Service worked in collaboration with the NRCS to develop specific conservation measures for the three core conservation management practices and the 18 facilitating conservation practice standards included in this Opinion. The Service believes that, as implemented, the conservation measures will result in ameliorating, minimizing, or eliminating potential adverse effects. However, even with the implementation of the conservation measures, some remaining adverse effects will occur to the gopher tortoise and other covered species as described below.

Nevertheless, the Service believes that the conservation measures, in concert with the goals and objectives of the WLFW – GT Program, may collectively produce beneficial effects to all covered species.

Planning and execution of NRCS' financial assistance to private landowners within the program guidance of the WLFW- GT Program depends upon the completion of a Conservation Plan. Consequently, the Service recognizes that conservation practice standards will be designed to work synergistically with other conservation practice standards under a conservation management system to achieve the purposes of the selected core management practice. This linkage between conservation practice standards produces benefits and minimizes adverse effects to the species. In some cases, application of several conservation practice standards at the local or landscape scale will produce benefits while simultaneously creating a potential temporary source of risk to individuals of the covered species. For example, mechanical treatments of habitat at the appropriate scale is expected to result in a positive population response for virtually all of the covered species over the long-term, despite the potential for some level of temporary disturbance to the individuals from the methods used.

Summary of Direct and Indirect Effects

In evaluating the direct, indirect and cumulative effects of the proposed action, the Service was able to identify and evaluate adverse effects common to the covered species. As such the Service is able to collectively evaluate the effects and summarize them as described below. It is important to note that the Service evaluation and determination of these common adverse effects duly considers and incorporates the conservation value of the identified conservation measures jointly developed by the partnership. When Conservation Practices are installed or applied to the land, short-term and long-term positive and/or negative effects may occur to the covered species. The following potential direct and indirect effects have been identified:

1. VEGETATION MODIFICATION – The purpose of many conservation practices is to maintain or improve vegetation on the land for a variety of conservation benefits. The installation or application of some conservation practices involves the removal or reduction of unwanted vegetation. Vegetation modification may be permanent or temporary, and may entail complete removal or targeted removal or reduction of undesirable or invasive species.

2. GROUND DISTURBANCE – The installation or application of many conservation practices will result in soil surface disturbance and/or compaction. The ground disturbance may involve minor surface disturbance such as vehicle tires or livestock movement, or deeper disturbance such as pipeline trenches.

3. HUMAN DISTURBANCE – The installation or application of most conservation practices will temporarily or permanently increase the presence and/or level of human activities (noise, visual disturbance). Temporary disturbance will occur during installation of structural practices such as pipelines and watering facilities. Long-term increases in human activity will occur where the conservation practice requires regular operation, maintenance, or monitoring.

4. EXOTICS – Many conservation practices are applied to remove or control undesirable non-native plants and animals. The installation or application of some conservation practices also has the potential

to introduce undesirable species into the area, or enhance the ability of undesirable species present in the area to increase or spread on the site, or be transported from the site.

Temporary soil disturbance, vegetation removal, and increased potential of introduction of invasive plants

Temporary soil disturbance and vegetation removal are expected from the implementation of many of the conservation practice standards. This disturbance may result in short-term loss of cover and forage; and increase the potential spread or establishment of invasive plants such as cogongrass. For purposes of this analysis, the Service is combining these conservation issues into a single discussion of their potential adverse effects.

Sources of the disturbance would include use of equipment (bush hogs, skidder sprayers, tractors, and other machinery) as well as practices that involve the planting or manipulation of vegetation (examples such as brush management, shrub control, and fire breaks). Common potential adverse effects identified by the Service include degradation of habitat conditions and the potential for increased habitat fragmentation if the scale of the disturbance is large enough and the potential to create opportunities for colonization of these disturbed sites by invasive plants.

Temporary adverse effects on individuals can include reproductive isolation, increased levels of stress hormones, reduced forage availability, burrow abandonment, and reduced shade/cover access. If these risks are realized, individual fitness is reduced and may have population level effects if disturbance is over a broad enough spatial or temporal scale.

Permanent Removal/loss of suitable habitat

Certain facilitating practices (firebreak, watering facility, pumping plant, water well, pipeline, and fence) covered in this Opinion have the potential to result in the permanent removal/loss of habitat for the covered species.

Most of the structural practices will produce minor localized losses which can be minimized using the identified recommended conservation measure(s). The conservation measure(s) focus on design and planning aspects of the practice so as to avoid large expanses of habitat loss especially from linear practices (e.g., fence lines, water pipelines, etc.), as well as avoid priority gopher tortoise habitat (specifically highly suitable soils), to minimize the adverse effects to the populations.

Increased potential of accidental mortality or injury to individuals

Prescribed burning as well as conservation practice standards that require the use of heavy mechanized equipment were identified as potentially causing mortality or injury to individuals of the covered species. These events can arise from: (a) Fires that burn too fast and/or hot and/or catch a tortoise outside of its burrow; (b) direct collision between the equipment and adults, juveniles, eggs and/or nests; and (c) indirectly via burrow collapse and subsequent entombment.

The use of specific conservation measures focusing on design, timing, and method of operation of machinery, including the use of avoidance buffers surrounding known gopher tortoise burrows, is

expected to significantly reduce the potential adverse effects of these conservation practice standards. This risk is primarily associated with the use of heavy machinery directly adjacent to or on top of the burrows, and should not restrict the use of hand tools within the buffer area. Since the majority of gopher tortoise nests are found directly outside the burrow entrance (i.e. burrow "apron"), maintaining a heavy machinery buffer around each known burrow should greatly reduce the risk of either directly destroying a nest or compacting the soil to the extent that an emerging hatchling cannot dig out. Although studies have shown that most adult gopher tortoises are capable of self-excavation following burrow collapse, the long-term individual and population-level effects are unknown, as are the abilities of commensals to self-excavate.

Summary of Effects

Habitat maintained by landowner participation in the WLFW – GT Program will increase the optimal matrix of habitat for the gopher tortoise, thereby reducing potential isolation between colonies. Implementation within the action area is expected to increase the amount and quality of suitable gopher tortoise habitat on private lands, thereby furthering recovery and conservation goals. Without management of the current and historic areas where these species occur but are not afforded protection and conservation, declines in populations have occurred or are expected. Although longleaf pine stands exist in the project area, pine plantations also exist, creating isolation and fragmentation between populations.

Natural regeneration of more open pine stands will be promoted, and this program is designed to provide a mosaic of habitat, retention of forest cover, as well as the strategic recruitment of colonies within the landscape of the identified project area as a means of combating the negative effects of forest fragmentation. The implementation of these conservation measures should carry much greater long-term positive effects such as enhancing occupied habitat through restoration of native grasses and natural canopy structure.

Creation, restoration, and enhancement of additional habitat may facilitate some adults and/or juveniles to reoccupy previously abandoned lands/habitats, and new populations and associated habitat components will be created which will contribute to the recovery and conservation of the species. Implementation of the described management practices may have a temporary impact to the gopher tortoise and other covered species in the form of harm and/or harassment; however, benefits from the creation, restoration and maintenance of habitat, especially when coupled with established conservation measures, will outweigh any temporary impacts associated with those practices.

The proposed action is not likely to adversely affect designated critical habitat for the dusky gopher frog.

CUMULATIVE EFFECTS

Cumulative effects include the impacts of future State, local, or private actions that are reasonably certain to occur in the action area considered in this Opinion. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA. Numerous non-federal actions that could affect listed species are reasonably certain to occur within the action area. These will typically include silviculture, mining,

agriculture, and grazing activities and urban development. Each of these future activities could contribute to cumulative effects on listed species or their habitat in the action area. However, the Service's Southeast Region has initiated development and implementation of a comprehensive strategy for conservation of the gopher tortoise and will be working with State partners, federal partners and private landowners to develop best management practices to minimize and avoid the adverse effects of many of these future actions and to ultimately conserve the species. Implementation of the strategy will vary by State and it is impossible to predict the success of the effort at this time. However, cumulatively, we anticipate that efforts will provide a net conservation benefit to the gopher tortoise as well as other covered species that co-occur with the gopher tortoise.

CONCLUSION

After reviewing the current status of the species, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological and conference opinion that the NRCS WLFW-GT Program, as proposed, is not likely to jeopardize the continued existence of the gopher tortoise, Dusky (=Mississippi) gopher frog, eastern indigo snake or the black pine snake.

Critical habitat has been designated for the dusky (=Mississippi) gopher frog in Mississippi and Louisiana. However, no permanent destruction or modification of that habitat is anticipated.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation under section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behaviors which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered a prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The prohibitions against taking the species found in section 9 of the Act do not apply until the species is listed. However, the Service advises the NRCS to consider implementing the following reasonable and prudent measures. If this conference opinion is adopted as a biological opinion following a listing of the gopher tortoise in the eastern portion of its range, or a designation of critical habitat, these measures, with their implementing terms and conditions, will be non-discretionary.

The measures described below are non-discretionary and must be undertaken by the NRCS so that they become binding conditions of any grant or permit issued to the applicants, as appropriate, for the exemption in section 7(o)(2) to apply. The NRCS has a continuing duty to regulate the activity covered by this incidental take statement. If the NRCS fails to assume or implement the terms and conditions or

fails to require the landowner to adhere to the terms and conditions of this incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the NRCS or landowner must report the progress of the action and its impact on the gopher tortoise (and other listed species) to the Service as specified in this incidental take statement [50 CFR 402.14(I)(3)].

AMOUNT OR EXTENT OF TAKE ANTICIPATED

The Service anticipates an annual average of 299,220 acres (taken from Table 3) of habitat could be temporarily (298,770 acres), or permanently (450 acres) disturbed or lost as a result of this proposed action. Additionally, an unknown number of individuals of the species may be injured or killed. However, we anticipate incidental take of individual gopher tortoise, eastern indigo snake, black pine snake and dusky gopher frog will be difficult to detect for the following reasons: (1) The gopher tortoise and eastern indigo snake have a wide-ranging distribution, are not restricted to specialized habitats, occupy a patchy distribution within occupied habitats and suitable habitat may not be occupied and; (2) the black pine snake and dusky gopher frog occupy a patchy distribution within occupied habitats and suitable habitat may not be occupied. Juvenile snakes of both species may be more vulnerable to adverse impacts from management actions because they are less likely to use underground refugia and often rely on above ground vegetation for cover. While the exact amount of incidental take of individuals of each species may be difficult to predict, this number is expected to be minimal with implementation of the proposed conservation measures. Additionally, we anticipate both habitat and species benefits with implementation of the proposed action that would exceed any incidental take. The incidental take is expected to be in the form of harm, harassment and direct mortality. The duration of the incidental take provided by this Opinion on WLFW– GT is for 30 years.

EFFECT OF THE TAKE

In the accompanying biological and conference opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

REASONABLE AND PRUDENT MEASURES

Minimize the adverse impacts of the proposed conservation practices while maximizing the long term benefits of the WLFW – GT Program.

TERMS AND CONDITIONS

1. The NRCS shall implement, as proposed, the conservation measures jointly developed between the Service and the NRCS.
2. The NRCS shall annually report to the Service, by December 31st of each year, the number of acres and feet of gopher tortoise habitat enrolled in the WLFW – GT Program.
3. If a dead, injured, or sick covered species is found in the project area, the nearest Service office shall immediately, within 24 hours, be contacted. Care should be taken in handling sick or injured wildlife to ensure effective treatment and care, or in the handling of dead specimens to preserve biological materials for later analysis.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency actions. The Service offers the following conservation recommendations:

- Equipment operators shall be instructed to avoid any snakes. If one is encountered, operations shall be temporarily halted until the snake moves out of harms way.

- NRCS should meet with the Service on at least an annual basis to evaluate the progress, successes, and challenges of the implementation of the WLFW – Gopher Tortoise Program.

- The Service should actively pursue plans to develop programmatic conservation agreements for the gopher tortoise which would provide willing landowners enrolled with long term assurances and provide for the conservation of the species on private lands.

- Conservation Plans for enrolled landowners should be written for at least 10 years to provide guidance to the landowner beyond the contract period.

- Develop an implementation process to ensure local NRCS and affected Service offices have the appropriate level of training and understanding of the conservation measures, and other operational components identified in the Opinion. The Service's Partners for Fish and Wildlife Program will continue to closely coordinate with NRCS to help implement the WLFW-Gopher Tortoise Program and related conservation efforts.

- As the science support and monitoring elements of the WLFW – Gopher Tortoise Program begin to produce information and data, NRCS will share this information with a wide range and diverse collection of partners (State Fish and Wildlife Agencies, Association of Fish and Wildlife Agencies, and others) to further enhance the conservation outcomes of the WLFW – Gopher Tortoise Program.

- The Service would like to reaffirm and express strong support for NRCS' use of Conservation Practice 338, Prescribed Fire. Prescribed fire is one of the top priorities for gopher tortoise habitat restoration and conservation. NRCS should consider giving greater priority to funding landowners who are willing to do growing season burns over cool season burns. Also if NRCS pays for more than one burn on the same acre, priority should be given to a landowner who is willing to vary the time of year when they conduct the prescribed burn.

- The Service requests that NRCS provide assistance and full support in the Service's effort to develop and execute gopher tortoise Candidate Conservation Agreements with Assurances and/or Safe Harbor Agreements for enrolled WLFW landowners throughout the range of the covered species.

REINITIATION-CLOSING STATEMENT

This concludes the Biological and Conference Opinion for the NRCS Working Lands For Wildlife Gopher Tortoise Program. The NRCS may ask the Service to confirm the Conference Opinion for the gopher tortoise in the eastern portion of its range that is currently a federal candidate species as a biological opinion if the gopher tortoise in the eastern portion of its range is listed or critical habitat is designated. The request must be in writing. During review of the proposed action, if the Service finds that there have been no significant changes in the action as planned or in the anticipated benefits or adverse effects analyzed herein, or information used, the Service will confirm the Conference Opinion as a Biological Opinion and no further Section 7 consultation on the proposed action will be necessary.

After listing of the species in the eastern portion of its range and/or designation of critical habitat and any subsequent adoption of this conference opinion the NRCS will request reinitiation of consultation if: (1) The amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect the species or critical habitat in a manner or to an extent not considered in this Opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the species or critical habitat that was not considered in this Opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action.

The incidental take statement provided in this conference report does not become effective until the species is listed and the conference report is adopted as the biological opinion issued through formal consultation. At that time the project will be reviewed to determine whether any incidental take of the gopher tortoise in the eastern portion of the range and black pine snake has occurred. Modifications of the Opinion and incidental take statement may be appropriate to reflect that take. No take of the gopher tortoise in the eastern portion of its range, or the black pine snake, may occur between the listing of the species and the adoption of the conference report through formal consultation.

9/18/12

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APPENDIX

I. NRCS - Conservation Planning
II. NRCS WHEG for Gopher Tortoise
III. Environmental Evaluation Worksheet (NRCS-CPA-52)

APPENDIX I – NRCS Conservation Planning

The NRCS works with landowners through conservation planning and assistance designed to benefit the soil, water, air, plants, and animals that result in productive lands and healthy ecosystems. The NRCS's natural resources conservation programs help people reduce soil erosion, enhance water supplies, improve water quality, increase wildlife habitat, and reduce damages caused by floods and other natural disasters. Public benefits include enhanced natural resources that help sustain agricultural productivity and environmental quality while supporting continued economic development, recreation, and scenic beauty. All conservation programs are voluntary and offer technical assistance and may offer financial incentives for planning and implementing conservation systems.

Conservation Planning Process

Local NRCS conservation planners develop conservation plans for clients that address environmental resource concerns on private, non-Federal, or Tribal lands. NRCS conservationists help individuals and communities to take a comprehensive approach to planning the proper use and protection of natural resources on these lands through a nine-step planning process described in the NRCS "National Planning Procedures Handbook" and illustrated in Figure 1.

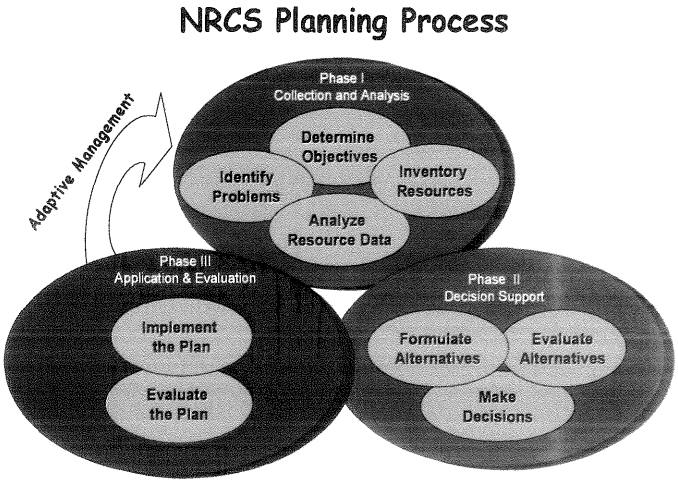

Figure 1. NRCS Planning Process

The planning process is initiated when a client requests NRCS assistance to address one or more resource concerns, usually on their private property and/or leased lands. Beginning with the initial site visit, the NRCS planner and client will complete the following nine steps in developing and implementing a conservation plan for the property. These iterative steps are a process that blends the objectives of the land owner, NRCS, and environmental laws:

Phase I - Collection and Analysis

Step 1 - Identify Problems and Opportunities

Identify resource problems, opportunities, and concerns in the planning area.

Step 2 - Determine Objectives

Identify and document the client's objectives.

Step 3 - Inventory Resources

Inventory the natural resources and their condition, and the economic and social considerations related to the resources. This includes on-site and related off-site conditions.

Step 4 - Analyze Resource Data

Analyze the resource information gathered in planning Step 3 to clearly define the natural resource conditions, along with economic and social issues related to the resources. This includes problems and opportunities.

Phase II - Decision Support

Step 5 - Formulate Alternatives

Formulate alternatives that will achieve the client's objectives, solve natural resource problems, and take advantage of opportunities to improve or protect resource conditions.

Step 6 - Evaluate Alternatives

Evaluate the alternatives to determine their effects in addressing the client's objectives and the natural resource problems and opportunities. Evaluate the projected effects on social, economic, and ecological concerns. Special attention must be given to those ecological values protected by law or Executive Order.

Step 7 - Make Decisions

The client selects the alternative(s) and works with the planner to schedule conservation system and practice implementation. The planner prepares the necessary documentation.

Phase III - Application and Evaluation

Step 8 - Implement the Plan

The client implements the selected alternative(s). The planner provides encouragement to the client for continued implementation.

Step 9 - Evaluate the Plan

Evaluate the effectiveness of the plan as it is implemented and make adjustments as needed. A financial assistance contract can be modified through this process.

QUALITY CRITERIA, CONSERVATION SYSTEMS AND PRACTICES

In Steps 5 and 6, the planner strives to help the client balance natural resource issues with economic and social needs through the development of a Resource Management System (RMS). An RMS is a combination of Conservation Practices that treat all Resource Concerns to a condition that meets or exceeds Quality Criteria for sustainable land use. Quality Criteria establishes the desired condition for a Resource Concern. An evaluation method (indicator) is chosen to evaluate each Resource Concern, and a target value (Quality Criteria) is established based on the evaluation method. Quality criteria for RMS's (see National Planning Procedures Handbook (NPPH), Subpart D, Section 600.43) are located in the Field Office Technical Guide (FOTG), Section III- http://efotg.nrcs.usda.gov/treemenuFS.aspx.

A Resource Concern is an element of the natural resources that may be sensitive to change by natural forces or human activity. Resource Concerns are nationally established soil, water, air, plant and animal resource elements used by NRCS to evaluate the health of the natural resources. The NRCS conducts an inventory of the planning area to determine the current condition of the Resource Concerns as the basis for developing the conservation plan. The NRCS Resource Concerns are nationally established indicators that are used to evaluate the health of the natural resources. The NRCS Rangeland Quality Criteria (Appendix 2) identifies the resource concerns that NRCS evaluates on rangelands in Arizona. It also provides the method of assessment as well as a description of the resource concern, Arizona quality criteria and an explanation of what constitutes a resource problem for each of the resource concerns.

A Resource Problem is identified when a Resource Concern does not meet Quality Criteria.

The client determines which resource problems they are ready, willing and able to treat using Conservation Practices to reach Quality Criteria.

A Conservation System is the implementation of a variety of conservation practices that together address multiple resource concerns. A Conservation Practice is a discrete set of technology used to address a resource problem. A conservation practice may be a structural or vegetative measure, or a management activity used to protect or reduce the degradation of soil, water, air, plant or animal resources. Some practices are stand-alone in that they can be implemented to meet a desired condition and not be associated with other practices, such as Prescribed Grazing (NRCS code 328). If the client has the ability to manage livestock in a matter to meet quality criteria, they can simply implement Prescribed Grazing through managing duration and numbers of livestock grazing on a given area. Other practices, such as Fence (NRCS code 382) are facilitating practices, in that they cannot stand alone to treat resource problems; rather they are installed to facilitate other conservation practices. A fence by itself does not do anything for conservation; when installed to facilitate Prescribe Grazing, it facilitates the manager's ability to manipulate livestock to achieve the goals of Prescribed Grazing.

The NRCS planner works with the client to develop and evaluate alternatives that would allow the user to manage the land to meet or exceed quality criteria for each resource concern. The client chooses the alternative consisting of a suite of Conservation Practices best suited to their needs and ability to implement. The suite of practices chosen becomes their Conservation Plan, a record of the client's

decisions for the treatment of resource problems. Therefore, it is the client's plan and not the NRCS' plan. The Conservation Plan identifies the conservation practices and a planned schedule for installing or applying the practices. The client can then apply for financial assistance to implement all or a portion of the conservation plan through NRCS, other agencies or through their own funding initiative.

As part of this conservation planning effort, individual environmental reviews called Environmental Evaluations (EE) are completed which inform the conservation planning effort and assist the Agency's compliance with NRCS regulations that implement NEPA. See Environmental Evaluation Worksheet (NRCS-CPA-52) in Appendix IV. The EE is a concurrent part of the planning process in which the potential long-term and short-term impacts of an action on people, their physical surroundings, and the natural environment are, evaluated and alternative actions explored. The EEs and conservation plans are developed to assist the client in making decisions and implementing the conservation practices identified in the conservation plan. A Conservation plan is a record of the client's decision to implement of one or more conservation practices which prescribe the actions necessary to address the identified resource concerns in need of treatment.

Structural conservation practices may have some short term (the construction or implementation phase) negative effects on certain listed species if they are in the action area, such as soil disturbance that can be mitigated through incorporation of conservation measures. The long-term (after construction through the life-span of the practice) effects are positive or beneficial for nearly all conservation practices. However, some practices can have longer-term effects to specific species, such as when the construction of a fire break done in a certain way may create a barrier to movement to sand skinks or other reptilian species. In some cases, long term effects may have "no effect" after the short-term effects have been mitigated for or disappeared.

The NRCS works with land users to plan and implement Resource Management Systems that will maintain or improve the condition and health of the soil, water, air, plant and animal resources for long term sustainability of a quality environment. The NRCS helps the land user understand the potential of the land, determine the current health and condition, and identify existing and potential resource problems.

CONSERVATION PRACTICE STANDARDS

The NRCS conservation practice standards establish criteria for applying conservation technology on the land and set the minimum acceptable level for application of the technology. Each conservation practice has a practice standard that guides the site-specific design. The NRCS issues National conservation practice standards in its National Handbook of Conservation Practices (NHCP), periodically revising them and developing new standards. Before revised or new conservation practice standards are added to the NHCP, they are advertised in the Federal Register for review and comment by the general public. All standards currently under Federal Register review are located at ftp://ftp-c.sc.egov.usda.gov/NHQ/practice-standards/federal-register.

Each state determines which National conservation practice standards are applicable in their state. States add the technical detail needed to effectively use the standards at the Field Office level, and issue them as state conservation practice standards. State conservation practice standards may be found in Section IV of the FOTG at: http://efotg.nrcs.usda.gov/treemenuFS.aspx. At a minimum, each state will review and revise each standard every 5 years.

Conservation Practice Standards include the Name, Code and Unit of Measure for the practice. They also include a Definition of the practice, list the Purpose(s) of the practice, describe the Conditions Where the Practice Applies (as well as where the practice may not apply), identify the minimum Quality Criteria for successfully achieving a single purpose or for multiple purposes, discuss special Considerations, which may be important to the successful operation of the practice after it has been applied, provide guidance for the development of Plans and Specifications used to install the practice, and provide instructions for developing the Operation and Maintenance guidance that will be used after practice installation. Each standard listed in Appendix 1 will be updated to include the conservation measures required through this programmatic consultation.

POTENTIAL RESOURCE EFFECTS OF IMPLEMENTING A RESOURCE MANAGEMENT SYSTEM

The potential effects of conservation practices were evaluated in several ways. The NRCS planning process has long been based on the ability of any given conservation practice to effectively address a resource concern. The agency has evaluated all the conservation practices through a Conservation Practice Physical Effects (CPPE) module completed at both the national and state level. This tool evaluates the ability of a conservation practice to address resource concerns and to meet quality criteria.

The NRCS, in collaboration with the Service, reviewed Conservation Practice Standards covered in the consultation (Table 1). We then listed the resource effects that can be expected from implementation of any given conservation practice through a conservation system and evaluated the impacts on all the covered species with particular emphasis placed on the gopher tortoise. Since the purpose of a resource management system is to improve natural resource conditions, conservation practices will normally have long term beneficial effects on listed species. Practice standards establish the minimum acceptable level of quality that is required to plan, design, install, operate, and maintain conservation practices.

SUPPORTING TOOLS USED TO CREATE A CONSERVATION PLAN

The Conservation Practices identified in Table 2 may be used in support of the WLFW – GT Program and have been evaluated using a Conservation Practice Physical Effects (CPPE) module. These evaluations and Diagrams of Effects can be found at the following link:

http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/technical/alphabetical/ncps/?&cid=nrcs143_026849

Wildlife Habitat Evaluation Guides (WHEG)

Wildlife Habitat Evaluation Guides (WHEG) are tools that are developed at the NRCS state level, and utilized by field personnel, to assess existing habitat conditions and identify limiting habitat factors in the planning area. WHEGs are species-specific. The objective of the WHEG is to evaluate habitat conditions that provide for the life requisites of the wildlife species under consideration and to inform alternative formulation and effects analysis. It is NRCS policy for each state to have a wildlife habitat evaluation protocol to be used in planning the upland Wildlife Habitat Management Standard (645). The standard also requires that the alternatives address the limiting factors in their order of significance, as indicated by the habitat evaluation. The WHEG's are named in a manner that may use terminology such as "evaluation", "appraisal"," assessment", or "habitat suitability model". They usually take a form similar to Habitat Suitability Index Models (F&WS Ecological Services Manual, Habitat as a Basis for Environmental Assessment, 1980) and often include variables that are relatively easy for non-biologist staff to collect while in the field. Many of these are species-specific for important wildlife common within each state, but there are also some "general" habitat assessment models that evaluate habitat on agricultural working lands where the landowner has not expressed an interest in a particular species.

NRCS has recently completed and established a WHEG for gopher tortoise across the southeastern United States and it is included below in Appendix II.

APPENDIX II

Wildlife Habitat Evaluation Guide (WHEG) for the Gopher Tortoise in the Southeastern United States – August 2012

This Wildlife Habitat Evaluation Guide (WHEG) is based on the habitat requirements of the Gopher Tortoise (*Gopherus polyphemus* Daudin). It is accepted that managing for this species benefits many other southeastern pine habitat-dependent species (e.g., Gopher Frog, Eastern Indigo Snake, Black Pine Snake, Bachman's Sparrow, and Red-cockaded Woodpecker). This model can be applied to all ecological sites with the potential to support a full range of *Pinus* species even if Gopher Tortoise does not currently occupy the habitat.

Gopher tortoises occupy a wide range of upland habitat types. The following physical and biotic features characterize most suitable habitats:
1. The presence of well-drained, sandy soils, which allow easy burrowing (because of lower ambient temperatures, the western population may require 39" or more of sandy soil depths);
2. An abundance of herbaceous ground cover; and
3. A generally open canopy and sparse shrub cover, which allow sunlight to reach the forest floor.

The traditional habitats of the western population of the Gopher Tortoise are natural xeric communities, mostly of the longleaf-pine-scrub oak type, located on sand ridges. The historical ecology of these xeric, fire dependent communities has been significantly altered. Gopher Tortoises may also be found in habitats such as fence rows, pastures, field edges, roads/driveways and right-of-ways (Recovery Plan, USFWS, 1990).

General Directions to the Gopher Tortoise WHEG: Mark as "N/A" (not applicable) if a habitat factor is absent due to normal seasonal dynamics (e.g., herbaceous species richness decision during the dormant season). If a factor is unknown, mark it with "unknown" and provide a brief explanation in the Additional Notes section. If multiple tracts/fields exist with different conditions and management, score each tract/field separately and prorate totals by acres. Choose best choice for "Existing Condition Value" and "Planned Value" (where applicable). Attach a map(s) showing fields, fences, water locations, burrow/forage movement areas, on and off-site (if possible) and other features if needed (e.g., impediments to movement).

On a wildlife habitat assessment/evaluation scale of 0 – 1.0 with 1.0 being an optimum score, NRCS Policy requires a 0.5 minimum to meet quality criteria for wildlife habitat. For Working Lands for Wildlife (WLFW), as with any other conservation planning, an alternative that maximizes habitat quality should be planned.

Owner/Operator:	State & Field Office:
County/Parish (T/R/Sec.)	Ecological Site(s) (ES) [list mapped ES (using official County/Parish Soil Survey (digital copy) or Web Soil Survey]: Note: some states may not have ESDs, if so, list soils for this site(s).
WHEG completed by:	
Farm Number: Tract Number: Field(s):	Acres (Total):

Contract Period:	Evaluation Date(s):

User Notes:

1. **Each *Project Area* (PA) shall be identified on a base map.**
2. **The PA is the portion of the FSA Tract where treatment for Gopher Tortoise (GT) is planned.**
3. **The PA boundary shall be identified using a thick black line, then the PA shall be subdivided into unique *Assessment Areas* (AA) and the delineation of the AA shall be shown on the base map.**
4. **Each AA shall be delineated with a dark red line and acres shall be determined and shown on the base map.**
5. **Portions of the tract and areas on adjoining tracts where treatment for GT are not planned shall not be assessed, regardless of ecological value to the GT, except on portions of the tract or whole tract(s) where treatments are not planned due to optimum existing conditions for the GT.**
6. **Each AA should be similar enough in ecological condition (soils, stand density, stand age, etc.) that a single *Representative Observation Point* (ROP) can be selected and used to score the AA.**
7. **Each ROP should be documented with GPS, and time-stamped digital photograph(s).**
8. **Data from each ROP represents the condition of the AA as a whole.**
9. **Locations of ROPs are determined with the aid of remote sensed date (e.g., quad maps, soils maps, aerial imagery, etc.) as well as an onsite reconnaissance.**
10. **Subdivision of the project area into AAs need not follow common land unit boundaries nor do AAs have to be contiguous. For example, if two non-contiguous areas have similar characteristics (i.e., would score the same), a single ROP is identified. If two non-contiguous areas are determined to be similar enough for a single ROP they shall be numbered as alpha then numeric (e.g., C-1, C-2, C-3, etc.).**
11. **Each ROP shall be identified on a base map with a black dot.**
12. **The acres of each AA shall be identified on the base map.**
13. **Following scoring of each AA, a weighted average by acres shall be conducted to determine the total score for the project area (see worksheet).**
14. **To not conflict with CLU numbering, AA numbering shall be alpha characters.**

Variable(s) (if not used in this State, enter NA in Existing Condition Value column)	Value Range	Existing Condition Value	Recommended Conservation Practice(s)	Planned Value
Burrow/Forage Habitat & General Conditions Variables (includes nesting habitat) – assign value if burrow/forage habitat is present or potentially present				
Section A. VEGETATION – total value for all 5 variables = 0.75				
(1) **Basal Area (BA) (BA = sq. ft./acre at DBH) = 0.15** **e.g., BA b) 0.75 X 0.15 = 0.1125**				

User Notes:

1. **Basal Area (BA) is determined at the ROP using an appropriate device (e.g., Angle Gauge, 10-factor Prism, penny coin) and shall not be visually estimated.**
2. **Only live trees will be used for BA.**
3. **BA is not limited to Pine and may include hardwoods.**

a) ≤60 BA	1.0			
b) 61–80 BA	0.75			
c) 81–90 BA	0.5			
d) >90 BA	0.25			

Field Notes:

(2) Non-herbaceous Foliar Cover (%) = 0.15
e.g., c) 0.5 X 0.15 = 0.075

User Notes:

1. **Percent canopy/foliar cover is determined by conducting a visual estimate using a 37.25 ft. radius plot (1/10 acre) with the ROP as the plot center.**
2. **Cover is visually estimated as relative canopy/foliar cover or converted to relative if absolute cover is used.**
3. **Shrubs are all woody species (including woody vines) <3" DBH and regardless of height.**
4. **Mid-season leaf-on condition will be used or predicted.**

a) <10%	1.0			
b) 10–39%	0.75			
c) 40–59%	0.5			
d) 60–79%	0.25			
e) >80%	0.0			

Field Notes:

(3) Herbaceous ground cover (%) = 0.25
e.g., a) 1.0 X 0.25 = 0.25

User Notes:

1. **Values represent relative cover determined with visual estimates.**
2. **If absolute cover estimates are used, the results will be converted to relative cover. Species used for this variable must be herbaceous (grasses, grass-likes, and forbs).**
3. **There is no maximum height limitation for a plant to be included.**
4. **Herbaceous vines (annual or perennial should be counted e.g., *Cocculus*, *Ipomoea*, *Mikania*).**
5. **Woody seedlings and young woody vines are not considered in this measure.**
6. **Mid-season leaf-on conditions will be used or predicted if the assessment is conducted during the dormant season.**

a) >80%	1.0			
b) 60–79%	0.75			
c) 40–59%	0.5			
d) 20–39%	0.25			
e) <20%	0.10			

Field Notes:

(4) Herbaceous species richness (grasses, grass-likes, and forbs) = 0.1
e.g., e) 0.0 X 0.1 = 0

User Notes:

1. **A 37.25 ft. radius plot will be used with the ROP being the center of the plot.**
2. **The number of different species will be inventoried.**

3. **Species do not need to be identified nor is there a maximum height limit for an herbaceous species to be counted.**
4. **Non-climbing herbaceous vines (those individuals that are not climbing within the plot) shall be included in this count.**
5. **Woody vines (e.g., *Rubus*, *Smilax*, *Vitis*, etc.) regardless of height are not herbaceous species.**

a) >20	1.0			
b) 16–20	0.75			
c) 11–15	0.50			
d) 5–10	0.25			
e) <5	0.0			

Field Notes:

(5) Noxious and or Invasive plant species % Cover = 0.1 [See USDA Plants (http://plants.usda.gov/java/), Federal and State lists]

e.g., d) 0.25 X 0.1 = 0.025

User Note:
Metrics are within the 37.25 foot radius plot located at the ROP, determined visually.

a) 0 %	1.0			
b) 1 – 3 %	0.75			
c) 3 – 6 %	0.5			
d) 6 – 10 %	0.25			
e) > 10 %	0.0			

Field Notes:

B. Management

(6) Prescribed Burning total value = 0.25

e.g., b) 0.75 X 0.25 = 0.1875

a) Prescribed burning applied in the growing season on a historic fire return interval (state determined).	1.0			
b) Prescribed burning applied in the dormant season on a historic fire return interval (state determined).	0.75			
c) Prescribed burning applied in the growing season, less frequently than historic fire return interval (state determined).	0.50			
d) Prescribed burning applied in the dormant season, less frequently than historic fire return interval (state determined).	0.25			
e) No prescribed burning	0.0			

Field Notes:

(7) Grazing Management (management that best fits the last 3 years) **If grazed, direct bonus is applied to score** **a) 0.05** **b) 0.025**				
a) Livestock use exclusion, or prescribed grazing designed and applied to enhance all gopher tortoise habitat characteristics in the WHEG	1.0			
b) Prescribed grazing designed and applied with less than all gopher tortoise habitat characteristics in the WHEG	0.5			
c) Uncontrolled and/or season-long livestock access and prescribed grazing is applied without gopher tortoise objectives	0.0			
Field Notes:				
Note: Variables 1 – 6 = 1.0 **Maximum score is set at 1.0 regardless of bonus**				
Burrow/Forage Habitat and General Conditions Average = SUM(Existing Condition Values)				
Burrow/Forage Habitat and General Conditions Average = SUM(Planned Values) = FINAL WHEG score				**Final WHEG Score**

Computation from above examples:
Section A. Vegetation
1. **BA b) 0.75 X 0.15 = 0.1125 +**
2. **Non-herb foliar cover c) 0.5 X 0.15 = 0.075 +**
3. **Herb ground cover a) 1.0 X 0.25 = 0.25 +**
4. **Herb species richness e) 0.0 X 0.1 = 0 +**
5. **Noxious plant d) 0.25 X 0.1 = 0.025 +**

Section B. Management
6. **Prescribed Burning 0.75 X 0.25 = 0.1875 +**
7. **Grazing a) + 0.05**

Grazing b) + 0.025

No grazing: 0.1125 + 0.075 + 0.25 + 0 + 0.0 + 0.025 + 0.1875 = 0.65
With Grazing a) 0.65 + 0.05 = 0.7
With Grazing b) 0.65 + 0.025 = 0.675

Summary Computation Area: If needed, to combine multiple Assessment Areas (AA) into a summarized score by acres assessed.
e.g., 100 acres Pine plantation WHEG score 0.4 +
100 acres open range WHEG score 0.8 = 0.4 + 0.8/2 = 0.6 WHEG total for Project Area (PA).

Variables	Suggested Conservation Practices for Resource Concerns
	Areas rating 0.5 or less, consider the following Conservation Practices
	Prescribed Burning 338: Use prescribed burning to remove duff layer and set back wood vegetation to an early succession stage. Also use fire early and often in young longleaf pine plantations.

(1) Basal Area	**Tree/Shrub Site Preparation 490:** Site prep to control hardwoods which prepares a better site for longleaf pine or Florida slash. This also reduces the potential for hardwood competition which will preclude the development of native ground cover.
	Integrated Pest Management 595: A site-specific combination of pest prevention, pest avoidance, pest monitoring, and pest suppression strategies.
	Tree and Shrub Establishment 612: Plant longleaf pine or Florida slash in south Florida to provide habitat for the Gopher Tortoise.
	Restoration and Management of Rare or Declining Habitats 643: Return aquatic or terrestrial ecosystems to their original or usable and functioning condition and to improve biodiversity by providing and maintaining habitat for fish and wildlife species associated with the ecosystem.
	Early Successional Habitat Development 647: Manage plant succession to develop and maintain early successional habitat to benefit desired wildlife and/or natural communities.
	Forest Stand Improvement 666: Manipulate species composition, stand structure, and stocking by cutting or killing selected trees and understory vegetation to appropriate basal area that optimizes sunlight to forest floor.
	Areas rating 0.5 or less, consider the following Conservation Practices
(2) Non-herbaceous Foliar Cover (%)	**Brush Management 314**: Plan brush management to control woody species and provide for an early succession habitat designed to meet landowners' goals.
	Prescribed Burning 338: Use prescribed burning to remove duff layer and set back wood vegetation to an early succession stage.
	Integrated Pest Management 595: A site-specific combination of pest prevention, pest avoidance, pest monitoring, and pest suppression strategies.
	Restoration and Management of Rare or Declining Habitats 643: Return aquatic or terrestrial ecosystems to their original or usable and functioning condition and to improve biodiversity by providing and maintaining habitat for fish and wildlife species associated with the ecosystem.
	Early Successional Habitat Development 647: Manage plant succession to develop and maintain early successional habitat to benefit desired wildlife and/or natural communities.
	Forest Stand Improvement 666: Manipulate species composition, stand structure, and stocking by cutting or killing selected trees and understory vegetation.
	Areas rating 0.5 or less, consider the following Conservation Practices
	Brush Management 314: plan brush management to control Woody species and allow for an early succession habitat on rangeland.
	Prescribed Burning 338: Use prescribed burning to remove duff layer and set back woody vegetation to an early

(3) **Herbaceous Ground Cover (%)**	succession stage.
	Tree/Shrub Site Preparation 490: Site prep to control hardwoods which prepares a better site for longleaf pine or Florida slash. This also reduces the potential for hardwood competition which will preclude the development of native ground cover.
	Prescribed Grazing 528: Exclude cattle grazing during spring months (March – May) to allow forbs/legumes to flower & fruit before grazing.
	Range Planting 550: Use range planting following ground disturbing conservation practices as needed and incorporate forbs/legumes into the seed mixture.
	Integrated Pest Management 595: A site-specific combination of pest prevention, pest avoidance, pest monitoring, and pest suppression strategies.
	Restoration and Management of Rare or Declining Habitats 643: Return aquatic or terrestrial ecosystems to their original or usable and functioning condition and to improve biodiversity by providing and maintaining habitat for fish and wildlife species associated with the ecosystem.
	Early Successional Habitat Development 647: Maintain plant succession to develop and maintain early successional habitat to benefit desired wildlife and/or natural communities.
	Forest Stand Improvement 666: Manipulate species composition, stand structure, and stocking by cutting or killing selected trees and understory vegetation to appropriate basal area that optimizes sunlight to forest floor.
(4) **Herbaceous Species Richness (grasses, grass-likes, and forbs)**	***Areas rating 0.5 or less, consider the following Conservation Practices***
	Brush Management 314: plan brush management to control Woody species and allow for an early succession habitat on rangeland.
	Prescribed Burning 338: Use prescribed burning to remove duff layer and set back woody vegetation to an early succession stage.
	Prescribed Grazing 528: Exclude cattle grazing during spring months (March – May) to allow forbs/legumes to flower & fruit before grazing.
	Range Planting 550: Use range planting following ground disturbing conservation practices as needed and incorporate forbs/legumes into the seed mixture.
	Integrated Pest Management 595: A site-specific combination of pest prevention, pest avoidance, pest monitoring, and pest suppression strategies.
	Early Successional Habitat Development 647: Maintain plant succession to develop and maintain early successional habitat to benefit desired wildlife and/or natural communities.
	Areas rating 0.5 or less, consider the following Conservation Practices
	Brush Management 314: Plan brush management to

(5) Noxious and or Invasive plant species	control wood species and provide for an early succession habitat designed to meet landowner's goals.
	Herbaceous Weed Control 315: Removal or control of herbaceous weeds including invasive, noxious and prohibited plants.
	Fence 382: use cross fence to reduce pasture size and make fields more uniform in size and/or production to allow for more uniform grazing.
	Prescribed Grazing 528: Plan rotational grazing to allow more adequate rest time between grazing events and reevaluate stocking rates.
	Heavy Use Area Protection 561: Plan Heavy Use Area Protection around conservation livestock areas (CLA) to minimize impacts of soil compaction and runoff.
	Integrated Pest Management 595: A site-specific combination of pest prevention, pest avoidance, pest monitoring, and pest suppression strategies.
	Watering Facility 614: use watering facilities to reduce CLA impacts to ecologically sensitive areas (e.g., wetlands) along with Heavy Use Area Protection to reduce or eliminate CLA.
	Early Successional Habitat Development 647: Manage plant succession to develop and maintain early successional habitat to benefit desired wildlife and/or natural communities.
	Forest Stand Improvement 666: Manipulate species composition, stand structure, and stocking by cutting or killing selected trees and understory vegetation.
(6) Prescribed Burning	***Areas rating 0.5 or less, consider the following Conservation Practices***
	Prescribed Burning 338: Use prescribed burning to remove duff layer and set back woody vegetation to an early succession stage.
	Fire Break 394: A permanent or temporary strip of bare or vegetated land constructed to minimize the spread of wildfire or to contain prescribed burns.
	Integrated Pest Management 595: A site-specific combination of pest prevention, pest avoidance, pest monitoring, and pest suppression strategies.
	Restoration and Management of Rare or Declining Habitats 643: Return aquatic or terrestrial ecosystems to their original or usable and functioning condition and to improve biodiversity by providing and maintaining habitat for fish and wildlife species associated with the ecosystem.
	Upland Wildlife Habitat Management 645: Provide and manage upland habitats and connectivity within the landscape for wildlife.
	Early Successional Habitat Development 647: Maintain plant succession to develop and maintain early successional habitat to benefit desired wildlife and/or natural communities
	Areas rating 0.5 or less, consider the following

(7) **Grazing Management**	***Conservation Practices***
	Brush Management 314: plan brush management to control Woody species and allow for an early succession habitat on rangeland.
	Prescribed Burning 338: Use prescribed burning to remove duff layer and set back woody vegetation to an early succession stage.
	Fence 382: use cross fence to reduce pasture size and make fields more uniform in size and/or production to allow for more uniform grazing.
	Prescribed Grazing 528: Exclude cattle grazing during spring months (March – May) to allow forbs/legumes to flower & fruit before grazing.
	Range Planting 550: Use range planting following ground disturbing conservation practices as needed and incorporate forbs/legumes into the seed mixture.
	Integrated Pest Management 595: A site-specific combination of pest prevention, pest avoidance, pest monitoring, and pest suppression strategies.
	Watering Facility 614: use watering facilities to reduce Concentrated Livestock Activity (CLA) impacts to ecologically sensitive areas (e.g., wetlands) along with Heavy Use Area Protection to reduce or eliminate CLA.
	Early Successional Habitat Development 647: Maintain plant succession to develop and maintain early successional habitat to benefit desired wildlife and/or natural communities.

Additional Notes:

Gopher Tortoise Age/Sex/Burrow Status/Presence (*Optional* - informational use only)				
Burrow(s) observed (indicate number per category):				
	Current ADULT (>6" wide)	Current JUVENILE (<6" wide)	*After* ADULT (>6" wide)	*After* JUVENILE (<6" wide)
Sex				
Active burrow(s)				

Inactive burrow(s)				
Abandoned burrow(s)				

APPENDIX III NRCS Planning Tools: Environmental Evaluation Worksheet (NRCS CPA 52)

U.S. Department of Agriculture — NRCS-CPA-52
Natural Resources Conservation Service — 5/2010

ENVIRONMENTAL EVALUATION WORKSHEET

A. Client Name:

B. Conservation Plan ID # (as applicable):
Program Authority (optional):

C. Identification # (farm, tract, field #, etc as required):

D. Client's Objective(s) (purpose):

E. Need for Action:

G. Alternatives

No Action √ if RMS ☐	*Alternative 1* √ if RMS ☐	*Alternative 2* √ if RMS ☐

Resource Concerns

In Section "F" below, analyze, record, and address concerns identified through the Resources Inventory process. (See FOTG Section III - Resource Quality Criteria for guidance).

F. Resource Concerns and Existing / Benchmark Conditions (Analyze and record the existing/benchmark conditions for each identified concern)	H. Effects of Alternatives: *No Action*		*Alternative 1*		*Alternative 2*	
	Amount, Status, Description (short and long term)	√ if does NOT meet QC	Amount, Status, Description (short and long term)	√ if does NOT meet QC	Amount, Status, Description (short and long term)	√ if does NOT meet QC
SOIL						
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
WATER						
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC

U.S. Department of Agriculture — NRCS-CPA-52
Natural Resources Conservation Service — 6/2010

ENVIRONMENTAL EVALUATION WORKSHEET

A. Client Name:

B. Conservation Plan ID # (as applicable):
Program Authority (optional):

C. Identification # (farm, tract, field #, etc as required):

D. Client's Objective(s) (purpose):

E. Need for Action:

G. Alternatives

No Action √ if RMS ☐	*Alternative 1* √ if RMS ☐	*Alternative 2* √ if RMS ☐

Resource Concerns

In Section "F" below, analyze, record, and address concerns identified through the Resources Inventory process. (See FOTG Section III - Resource Quality Criteria for guidance).

F. Resource Concerns and Existing / Benchmark Conditions (Analyze and record the existing/benchmark conditions for each identified concern)	H. Effects of Alternatives: *No Action* — Amount, Status, Description (short and long term)	√ if does NOT meet QC	*Alternative 1* — Amount, Status, Description (short and long term)	√ if does NOT meet QC	*Alternative 2* — Amount, Status, Description (short and long term)	√ if does NOT meet QC
SOIL						
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
WATER						
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC